**Document number 452**

**Text number 0**

The Amazon rainforest (Portuguese: Floresta Amazônica or Amazônia; Spanish: Selva Amazónica, Amazonía or generally Amazonia; French: Forêt amazonienne; Dutch: Amazoneregenwoud), also known in English as Amazonia or the Amazon jungle, is a moist deciduous forest that covers most of the Amazon basin in South America. This basin covers 7 000 000 square kilometres (2 700 000 sq mi), of which 5 500 000 square kilometres (2 100 000 sq mi) is covered by rainforest. The area includes the territories of nine nations. Most of the forest is in Brazil, which has 60% of the rainforest, 13% in Peru, 10% in Colombia and small amounts in Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana. The names of the states or departments of four of the nations have the word "Amazonas" in their names. The Amazon represents more than half of the world's remaining rainforests and is the largest and most diverse tropical rainforest region in the world, with an estimated 390 billion individual trees of 16 000 species.

**Question 0**

What is the name used to describe the Amazon rainforest in English?

**Question 1**

How many square kilometres of rainforest are there in the basin?

**Question 2**

How many countries control this area in total?

**Question 3**

How many nations have "Amazon" in their name?

**Question 4**

What percentage of the world's rainforests does the Amazon region represent?

**Question 5**

What is the Dutch word for Amazon rainforest?

**Question 6**

Which rainforest covers most of the Amazon basin in South America?

**Question 7**

In which country is most of the Amazon rainforest located?

**Question 8**

How much of the world's rainforests are Amazon rainforests?

**Question 9**

How many tree species are found in the Amazon rainforest?

**Question 10**

What kind of forest is the Amazon rainforest?

**Question 11**

How many square kilometres is the Amazon basin?

**Question 12**

How many nations are there in the Amazon basin?

**Question 13**

Which country has most of the Amazon forest?

**Question 14**

What is the estimate of the number of tree species in the Amazon tropical rainforest?

**Question 15**

Amazon or Amazon Jungle is no longer used to refer to what?

**Question 16**

What covers most of the Amazon basin in Central America?

**Question 17**

201 000 000 square metres of rainforest cover what?

**Question 18**

What are the nineteen nations in this region?

**Question 19**

The Amazon accounts for less than half of the planet's remaining what?

**Text number 1**

Since the Cretaceous-Palaeogene extinction, the extinction of dinosaurs and a wetter climate may have allowed tropical rainforests to spread across the continent. In 66-34 Mya rainforest extended up to 45° south. Climate variations over the last 34 million years have allowed savannah areas to spread into the tropics. During the Oligocene, for example, the rainforest extended over a relatively narrow area. It expanded again during the middle Miocene and then retreated mainly inland during the last glacial maximum. However, the rainforest continued to flourish during these glacial periods, allowing a wide range of species to survive and evolve.

**Question 0**

What kind of climate may have allowed rainforests to spread across the continent?

**Question 1**

What has allowed the savannah to expand into the tropics?

**Question 2**

At what time did the rainforest extend over a narrow strip of land?

**Question 3**

When did it retreat inland?

**Question 4**

Did rainforests manage to thrive during the ice ages?

**Question 5**

What might have caused rainforests to grow in South America?

**Question 6**

How many degrees south did the Amazon rainforest extend during 66-34 Mya?

**Question 7**

What has caused the savannah regions to grow into the South American tropics over the past 34 million years?

**Question 8**

At what time in history was the Amazon rainforest a narrow strip of forest?

**Question 9**

What were the Amazon rainforests doing during the mid-century?

**Question 10**

What extinction event may have created the conditions that have allowed the Amazon rainforest to expand?

**Question 11**

How many years ago did the Amazon rainforest extend 45 degrees south?

**Question 12**

During what period of time did the Amazon rainforests begin to expand after the Oligocene epoch?

**Question 13**

Around what global event did the Amazon rainforest become the closest thing to an inland forest?

**Question 14**

Have the Savannah regions expanded in recent years?

**Question 15**

What kind of climate will stop the amplified spread across the continent?

**Question 16**

Which extinction led to the decline of rainforests?

**Question 17**

Which extended to 45° north?

**Question 18**

Climate variations have prevented the savannah from doing what?

**Question 19**

In which periods did rainfall fail?

**Text number 2**

During the mid-Eocene, it is believed that the Purus arc split the Amazon basin in the middle of the continent. Water flowed eastwards towards the Atlantic Ocean, while westwards it flowed through the Amazon basin towards the Pacific Ocean. However, as the Andes mountains rose, a large basin was created, enclosing the lake now known as the Solimões basin. Over the last 5-10 million years, this accumulated water broke through the Purus Arc and joined the easterly flow towards the Atlantic Ocean.

**Question 0**

At what point was the Amazon basin divided?

**Question 1**

Which way did the water flow on the east side?

**Question 2**

What is the name of the basin created by the closed lake?

**Question 3**

How long has it been since the water broke through the Purus arch?

**Question 4**

What was it related to downstream?

**Question 5**

When was the Amazon basin believed to have been split in the middle of South America?

**Question 6**

Where did the water flow east of the Amazon basin go?

**Question 7**

Where did the water flow to on the western side of the Amazon basin?

**Question 8**

Over which part of the Pacific Ocean did the water have to flow during the middle Eocene?

**Question 9**

What basin was formed when the Andes Mountains rose?

**Question 10**

Over what period of time is the Amazon basin likely to have been divided?

**Question 11**

Where on the continent is the Amazon basin believed to be split?

**Question 12**

Where did the water go east of the Amazon basin after the split?

**Question 13**

Where did the water from the Amazon basin flow to as it headed west?

**Question 14**

What is the name of the lake that was formed as a result of the rise of the Andes Mountains?

**Question 15**

What divided the Amazon basin in the north of the continent?

**Question 16**

Which ocean on the eastern side of the ocean floats away?

**Question 17**

The water on the west side flowed downstream of the basin and what towards the sea?

**Question 18**

Rocky Mountains closed late to create what base?

**Question 19**

The water broke through and joined the western current of the Pacific?

**Text number 3**

There is evidence that the vegetation of the Amazon rainforest has changed significantly over the past 21 000 years during the last glacial maximum (LGM) and the subsequent glaciation. Analyses of sedimentary layers from paleolakes and the Amazon Fan in the Amazon Basin show that precipitation in the basin during the LGM was lower than today, almost certainly associated with a reduction in humid tropical vegetation in the basin. However, the extent of this reduction is disputed. Some researchers argue that the rainforest was reduced to small, isolated refuges separated by open forest and grasslands; other researchers argue that the rainforest remained largely intact, but extended less north, south and east than it does today. This debate has been difficult to resolve because the practical limitations of working in the rainforest mean that data collection has been skewed away from the central Amazon basin, and the available data reasonably support both explanations.

**Question 0**

What does LGM stand for?

**Question 1**

What did the analyses of the sediment layers show?

**Question 2**

What arguments do the researchers put forward?

**Question 3**

How is this debate proven?

**Question 4**

How are explanations supported?

**Question 5**

In how many years has there been a major change in the vegetation of the Amazon rainforest?

**Question 6**

What caused the changes in the vegetation of the Amazon rainforest?

**Question 7**

What has been analysed to compare Amazon rainfall in the past and present?

**Question 8**

What causes the lower rainfall in the Amazon region during the LGM?

**Question 9**

Many changes in the Amazon rainforest vegetation have occurred since the last glacial maximum, which was how many years ago?

**Question 10**

Analysis of which strata from the Amazon fan show that precipitation in the Amazon basin has changed?

**Question 11**

What type of vegetation in the Amazon basin has been reduced due to changes in rainfall?

**Question 12**

Scientists disagree on how the Amazon rainforest has changed over time, with some arguing that it has shrunk into discrete refuges separated by what?

**Question 13**

Why is it difficult to resolve disagreements over changes in the Amazon rainforest?

**Question 14**

There have been few changes in the vegetation of the Amazon rainforest in recent years.

**Question 15**

What was higher during the LGM than today?

**Question 16**

What is easily proven about the rainforest

**Question 17**

The data sample strongly supports that what remained largely unchanged??

**Text number 4**

NASA's CALIPSO satellite has measured the amount of dust carried by the wind from the Sahara to the Amazon: an average of 182 million tonnes of dust blown by the wind from the Sahara each year, 15 degrees west longitude, 1 600 miles (2 600 km) across the Atlantic (some of the dust falls into the Atlantic), then 35 degrees west longitude on the east coast of South America, on 27 May. 7 million tons (15%) of dust falls over the Amazon basin, 132 million tons of dust stays in the air, 43 million tons of dust blows and falls into the Caribbean Sea at 75 degrees west longitude.

**Question 0**

What is the name of the satellite that measured the amount of dust?

**Question 1**

How many tonnes of dust are blown out of the Sahara every year?

**Question 2**

How many kilometres does dust travel over the Atlantic Ocean?

**Question 3**

Where does the dust fall?

**Question 4**

How many tonnes of dust are left in the air?

**Question 5**

What instrument has been used to measure the amount of dust transported from the Sahara to the Amazon?

**Question 6**

How much dust is blown out of the Sahara every year?

**Question 7**

How much Saharan dust is deposited over the Amazon basin each year?

**Question 8**

How much Saharan dust is left in the air over the Amazon each year?

**Question 9**

How much Saharan dust blows and falls into the Caribbean Sea each year?

**Question 10**

What was the name of the satellite that measured the amount of dust going into the Amazon?

**Question 11**

Which organisation manages the satellite that measured the dust that landed in the Amazon?

**Question 12**

How much wind-blown dust leaves the Sahara every year?

**Question 13**

How many kilometres does Saharan dust travel across the Atlantic Ocean?

**Question 14**

How many tonnes of Saharan dust fall into the Amazon basin every year?

**Question 15**

What's the name of the satellite that measured the amount of vegetation from so high in the Amazon?

**Question 16**

How many tonnes of dust are blown out of the rainforest each year?

**Question 17**

How many kilometres does the dust travel over the Pacific Ocean?

**Question 18**

How much dust is blown into the echo sounder each year

**Question 19**

Where in C are 48 million tonnes of dust blown into every year?

**Text number 5**

It was long thought that the Amazon rainforest was only ever sparsely populated because the poor soil made it impossible to sustain a large population through agriculture. Archaeologist Betty Meggers was a major proponent of this idea, as described in her book Amazon: Man and Culture in a Fake Paradise. She argued that 0.2 inhabitants per square kilometre is the maximum population density that can be maintained in the rainforest through hunting, and that for a larger population, agriculture is needed. However, recent anthropological discoveries have shown that the area was indeed densely populated. The Amazon may have been inhabited by around 5 million people in 1500 AD, divided between dense coastal settlements such as the Marajó and inland inhabitants. By 1900 the population had fallen to 1 million and by the early 1980s it was less than 200 000.

**Question 0**

What is the title of a book written by archaeologist Betty Meggers?

**Question 1**

What is the maximum square kilometres Betty Meggers claimed that a rainforest can survive?

**Question 2**

What would be needed to accommodate a larger population?

**Question 3**

Which findings indicated that the area was densely populated?

**Question 4**

How many people could have lived in the Amazon in 1500 AD?

**Question 5**

What feature of the Amazon made people believe that there could not be many inhabitants?

**Question 6**

Which well-known archaeologist believed that the Amazon was not much populated?

**Question 7**

How many people did Betty Meggers believe could live on every square kilometre of the Amazon?

**Question 8**

In which book did Betty Meggers describe the idea of sparse settlement in the Amazon?

**Question 9**

Which archaeologist came up with the idea that the Amazon rainforest could not support large populations?

**Question 10**

Which book discussed the theory of low population in the Amazon rainforest?

**Question 11**

What was the theoretical maximum population density per square kilometre of the Amazon rainforest?

**Question 12**

How many people were thought to have lived in the Amazon in 1500 AD?

**Question 13**

What was the population of the Amazon region in the 1980s?

**Question 14**

What is the title of the book edited by archaeologist Betty Meggers?

**Question 15**

For a long time it was believed that what was densely populated?

**Question 16**

Who said that a rainforest can only have two inhabitants per square kilometre?

**Question 17**

Betty Meggers said that hunting was needed to feed a large population, where?

**Question 18**

In which decade did more than 200 000 people live in the rainforest?

**Text number 6**

The first European to travel the length of the Amazon River was Francisco de Orellana in 1542. The BBC's Unnatural Histories programme presents evidence that Orellana was not exaggerating his claims, as previously thought, but was correct in his findings that a complex civilisation flourished along the Amazon in the 1540s. It is believed that this civilisation was later destroyed by the spread of diseases from Europe, such as smallpox. Since the 1970s, numerous geoglyphs dating from 0-1250 AD have been found in deforested lands, confirming claims of pre-Columbian civilisations. Ondemar Dias is considered to have been the first to discover the geoglyphs in 1977, and Alceu Ranzi continued to find them after flying over Acre. The BBC's Unnatural Histories programme presented evidence that the Amazon rainforest is not a pristine wilderness but has been shaped by humans for at least 11 000 years through practices such as silviculture and terra preta.

**Question 0**

Who was the first European to travel on the Amazon River?

**Question 1**

At what time was civilisation in the Amazon flourishing when Orellana made his discoveries?

**Question 2**

What was believed to be the cause of the fall of civilisation?

**Question 3**

How long has it been since geoglyphs were first discovered on drained land?

**Question 4**

What period do the geoglyphs date from?

**Question 5**

Who was the first European to walk the entire length of the Amazon?

**Question 6**

What year was the first European to travel the entire length of the Amazon?

**Question 7**

What period of time were geoglyphs found in the deforested land along the Amazon River?

**Question 8**

Who is credited with discovering the geoglyphs along the Amazon River?

**Question 9**

For how many years was there evidence that humans were shaping the Amazon?

**Question 10**

Who was the first American to travel to the Amazon River?

**Question 11**

Who made exaggerated claims about a complex civilisation in the Amazon?

**Question 12**

What region lacked a complex civilisation in the 1540s?

**Question 13**

What are the causes of diseases originating in Africa?

**Question 14**

A BBC documentary presented evidence that the Amazon has been a pristine wilderness for at least how long?

**Text number 7**

Terra preta (black soil), which has spread over large areas of Amazonian forests, is now widely accepted as a product of indigenous land use. The development of this fertile soil enabled agriculture and forestry in a previously hostile environment, meaning that much of the Amazon rainforest is likely the result of centuries of human management, rather than being naturally formed as previously assumed. In 2003, Michael Heckenberger and colleagues at the University of Florida discovered remnants of some of these large settlements in the Xingu tribe's area of the Amazon forest. Among them was evidence of roads, bridges and large plazas.

**Question 0**

What is the name of a terra preta?

**Question 1**

How much terra preta is there in the Amazon forest?

**Question 2**

What did the development of this fertile soil offer in a hostile environment?

**Question 3**

In which area of the tribe were large settlements found?

**Question 4**

Who found these and where did they come from?

**Question 5**

What type of soil is considered to be the result of indigenous land use in the Amazon forest?

**Question 6**

What happened in the Amazon forest thanks to the development of Terra Preta?

**Question 7**

On which tribal lands are the remains of large settlements found?

**Question 8**

Who is credited with finding evidence of large settlements in the Amazon forest?

**Question 9**

What kind of structures were found in 2003?

**Question 10**

Terra preta is a distributor in a small area what?

**Question 11**

What is the product of alien soil management?

**Question 12**

Only a small part of the Amazon forest is the result of what?

**Question 13**

Who discovered evidence of a large settlement in the Amazon rainforest in 2000?

**Question 14**

What is the reason why much of the Amazon is poor soil?

**Text number 8**

The area is home to around 2.5 million species of insects, tens of thousands of plants and around 2 000 species of birds and mammals. To date, at least 40 000 plant species, 2 200 fish species, 1 294 bird species, 427 mammal species, 428 amphibian species and 378 reptile species have been scientifically classified. One in five of the world's bird species live in the Amazon rainforest, and one in five fish species live in Amazon rivers and streams. Scientists have described between 96 660 and 128 843 invertebrate species in Brazil alone.

**Question 0**

How many insect species are known from the area?

**Question 1**

What proportion of all bird species in the world live in rainforests?

**Question 2**

How many plant species are there in the rainforest in total?

**Question 3**

How many species of fish live in the Amazon?

**Question 4**

How many invertebrate species are known in Brazil alone?

**Question 5**

How many species of insects live in the Amazon?

**Question 6**

How many species of birds and mammals are there in the Amazon?

**Question 7**

How many plant species are estimated to be present in the Amazon?

**Question 8**

How many reptiles have been found in the Amazon?

**Question 9**

How many species of birds on Earth are found in the Amazon rainforest?

**Question 10**

The region is home to 25 million what?

**Question 11**

Where does one of the world's seven bird species live?

**Question 12**

Where do 96 660-128 843 vertebrate species live?

**Question 13**

How many reptiles are there in Amazon rivers and streams?

**Text number 9**

Plant biodiversity is the highest in the world, and a 2001 study found that more than 1 100 tree species grow in a quarter of a square kilometre (62 hectares) of Ecuador's rainforest. A 1999 study found that one square kilometre (247 acres) of Amazon rainforest can contain around 90,790 tonnes of living plants. The average plant biomass is estimated at 356 ± 47 tonnes per hectare. An estimated 438 000 economically and socially important plant species have been recorded in the region to date, with many more yet to be discovered or catalogued. The total number of tree species in the area is estimated at 16 000.

**Question 0**

How many kilometres of hectares of Ecuador's rainforest are supported?

**Question 1**

How many species of trees are there in a rainforest?

**Question 2**

How many tonnes of living plants are there in a rainforest?

**Question 3**

What is the average biomass of plants?

**Question 4**

What is the number of plant species of economic and social interest?

**Question 5**

Where does the Amazon rank in terms of the world's biodiversity?

**Question 6**

How many tree species were found in one square kilometre of Ecuadorian rainforest in 2001?

**Question 7**

How many tonnes of living plants were found in one square kilometre of the Amazon rainforest in 1999?

**Question 8**

What is the average weight of biomass per hectare in the Amazon?

**Question 9**

How many plant species of interest to society and manufacturers are found in the Amazon rainforest?

**Question 10**

Which species has the lowest biodiversity in the world?

**Question 11**

What rain forced the maintenance of more than 11 003 species.

**Question 12**

A 1999 study found that 100 km² of rainforest contains how many living plants?

**Question 13**

What species are registered in 4380?

**Question 14**

There is very little that is still to be found?

**Text number 10**

There are several species in the rainforest that can pose a risk. The major predators are the black caiman, jaguar, cougar and anaconda. In rivers, electric eels can cause electric shocks that can stun or kill, and piranhas have been known to bite and wound people. Several species of poisonous frog excrete lipophilic alkaloid poisons through their flesh. There are also numerous parasites and pathogens. Vampire bats live in rainforests and can spread the rabies virus. Malaria, yellow fever and dengue fever can also be contracted in the Amazon.

**Question 0**

Which animal living in the Amazon River can cause a deadly electric shock?

**Question 1**

The Amazon rainforest's large carnivores include the jaguar, cougar and anaconda, what is another example?

**Question 2**

Which fish in the Amazon River is known to bite humans?

**Question 3**

What are spiny anteaters known to excrete?

**Question 4**

Which bat species in the Amazon rainforest can spread rabies?

**Question 5**

Which animal in the Amazon River causes mild shock?

**Question 6**

The smallest predators are the black caiman and which?

**Question 7**

The devil didn't really do what?

**Question 8**

What do different lizard species excrete?

**Question 9**

Vampire bats do not actually spread what?

**Text number 11**

Deforestation is the conversion of forested areas into unforested areas. The main sources of deforestation in the Amazon are human settlement and land development. Before the 1960s, access to the interior of the forest was very limited and the forest remained basically untouched. The farms established in the 1960s were based on crop cultivation and slash-and-burn agriculture. However, the migrants were unable to manage their fields and crops due to the loss of soil fertility and the spread of weeds. Amazonian soils are only productive for a short time, so farmers are constantly moving to new areas and clearing more land. These farming practices led to deforestation and caused widespread environmental damage. Deforestation is significant, and areas cleared of forest are visible to the naked eye from space.

**Question 0**

What is called removing trees from the forest?

**Question 1**

Access to the Amazon rainforest was restricted before what era?

**Question 2**

What method was used to clear the forest for cultivation in the Amazon forest?

**Question 3**

What two factors made it difficult for migrants to survive in the Amazon forest?

**Question 4**

What is remarkable about the Amazon forest as seen from space?

**Question 5**

What is the process of growing more trees in a forest?

**Question 6**

The Amazon rainforest assessment was restricted after which era?

**Question 7**

What method was used for deforestation before 1960?

**Question 8**

What is productive for a long time at Amazon?

**Question 9**

Where can you see areas of dense forest with the naked eye?

**Text number 12**

Between 1991 and 2000, the Amazon's forest area increased from 415 000 to 587 000 square kilometres (160 000 to 227 000 square kilometres), with most of the lost forest being converted into pasture for cattle. Seventy percent of the former forested land in the Amazon and 91% of the land drained since 1970 is used for cattle grazing. Brazil is currently the world's second largest producer of soybeans after the United States. However, a new study by Leydimere Oliveira and others has shown that the more rainforest that is logged in the Amazon, the less rainfall there is and the lower the yield per hectare. So, contrary to popular belief, Brazil has not benefited economically from cutting down rainforest zones and converting them to pasture.

**Question 0**

How many square kilometres of Amazon forest were lost by 1991?

**Question 1**

How many square kilometres of Amazon forest were lost in 2000?

**Question 2**

What will most of the land cleared in the Amazon be used for?

**Question 3**

Where does Brazil rank globally in soybean production?

**Question 4**

How much of the land cleared in the Amazon is used for livestock farming?

**Question 5**

In which years were 41 500 square kilometres of Amazonian power lost?

**Question 6**

What is the world's second smallest soy producer?

**Question 7**

91% of what is spent on agriculture?

**Question 8**

Who showed that blogging increases rainfall in the Amazon?

**Text number 13**

The needs of soy growers have been used to justify many of the controversial transport projects currently being developed in the Amazon. The first two highways successfully opened up the rainforest and led to increased settlement and deforestation. Average annual deforestation between 2000 and 2005 (22 392 km2 or 8 646 square metres per year) was 18% higher than in the previous five years (19 018 km2 or 7 343 square metres per year). Although deforestation in the Brazilian Amazon has decreased significantly between 2004 and 2014, it has increased until today.

**Question 0**

The highways built in the Amazon rainforest were built primarily for what farmers?

**Question 1**

Where did the creation of highways in the Amazon rainforest lead?

**Question 2**

How many square kilometres per year were cleared between 2000 and 2005?

**Question 3**

How much more deforestation occurred in 2000-2005 than in 1995-2000?

**Question 4**

What happened to deforestation in the Brazilian Amazon between 2004 and 2014?

**Question 5**

Which farmers have opposed many of the Amazon's transport projects?

**Question 6**

What failed to open up the rain forced Emily to reduce settlement?

**Question 7**

During which years did deforestation decrease by 18%?

**Question 8**

During which years did deforestation increase in Brazil?

**Question 9**

What types of projects are widely supported?

**Text number 14**

Environmentalists are concerned about the loss of biodiversity due to deforestation and the release of carbon from vegetation, which could accelerate global warming. The Amazon's evergreen forests account for about 10% of the Earth's primary productivity and 10% of the ecosystems' carbon stocks - about 1.1 × 1011 tonnes of carbon. The Amazon forest is estimated to have accumulated 0.62 ± 0.37 tonnes of carbon per hectare per year between 1975 and 1996.

**Question 0**

What environmentalists are concerned about the loss of the Amazon forest?

**Question 1**

What could be the cause of biodiversity loss, according to environmentalists?

**Question 2**

What are environmentalists worried about as water is released from the Amazon?

**Question 3**

How much of the world's carbon is stored in the Amazon forest?

**Question 4**

How many tonnes of carbon are believed to be stored in the Amazon forests?

**Question 5**

What is biodiversity loss not linked to?

**Question 6**

The release of carbon from vegetation slows down what?

**Question 7**

How much of the world's carbon dioxide is stored in the Amazon forest?

**Question 8**

How many tonnes of carbon are thought to be released from the Amazon rainforest each year?

**Text number 15**

A computer model of future climate change caused by greenhouse gas emissions shows that the Amazon rainforest could become unsustainable as rainfall decreases significantly and temperatures rise, leading to near total loss of rainforest cover in the basin by 2100. However, climate change simulations of the Amazon basin in many different models are not consistent in estimating precipitation responses, ranging from weak increases to strong decreases. The result indicates that rainforests may be threatened not only by deforestation but also by climate change in the 21st century.

**Question 0**

What change in conditions could make the Amazon rainforest unsustainable?

**Question 1**

What kind of emissions could cause the total disappearance of rainforests?

**Question 2**

If one computer model turns out to be correct, by what year would the rainforests in the Amazon Basin have almost completely disappeared?

**Question 3**

How long could the Amazon rainforest be under threat, according to some computer models?

**Question 4**

What are the biggest threats to the Amazon rainforest this century?

**Question 5**

Increased rainfall and falling temperatures can make anything unsustainable?

**Question 6**

A reduction in greenhouse gases could lead to the complete disappearance of what?

**Question 7**

According to some computer models, the rainforest is under threat after what?

**Question 8**

Hunting and population are the main threats, threatened by what?

**Question 9**

Simulating what is consistent across models?

**Text number 16**

As indigenous peoples' territories continue to be destroyed by deforestation and ecocide, as in the Peruvian Amazon, indigenous rainforest communities continue to disappear, while others, such as the Urarines, continue to fight for their cultural survival and the fate of their forest territories. At the same time, the relationship of primates to the livelihoods and symbolism of indigenous peoples in the lowlands of South America has received increasing attention, as have ethnobiology and community-based conservation efforts.

**Question 0**

Which areas are being destroyed by Amazon ecocide?

**Question 1**

What kind of conservation efforts have attracted attention in the Amazon?

**Question 2**

In what two ways are indigenous territories being largely destroyed?

**Question 3**

The indigenous peoples of the Peruvian Amazon are one group struggling in the Amazon, what is the other group?

**Question 4**

What is the growing interest in the Amazon indigenous group?

**Question 5**

What is still destroying modern settlements?

**Question 6**

Community-based conservation measures will be replaced where

**Question 7**

The indigenous peoples of the Peruvian Amazon and what other group continues to grow in the Amazon?

**Question 8**

Where has the relationship between people received more attention?

**Question 9**

What kind of protection measures are in place to protect indigenous peoples' territories?

**Text number 17**

Remote sensing for Amazon conservation is also used by indigenous tribes in the Amazon basin to protect their tribal lands from commercial interests. Using handheld GPS devices and software like Google Earth, members of the Trio tribe in the rainforests of southern Suriname are mapping their ancestral lands to stake their territorial claims. Currently, most tribes in the Amazon region do not have clearly defined boundaries, making it easier for commercial companies to target their territories.

**Question 0**

What kind of transmission technology is used to protect the lands of the Amazon tribes?

**Question 1**

Which tribe uses GPS devices to map countries?

**Question 2**

Which tribal members living in the rainforests of which region use Google Earth?

**Question 3**

What do tribes use Google Earth and GPS for?

**Question 4**

Why do some tribes use remote sensing technology?

**Question 5**

Indigenous tribes use on-site identification to determine what is

**Question 6**

What makes it easier for the government to target tribal areas?

**Question 7**

Most areas of the Amazon have clearly defined boundaries.

**Question 8**

Commercial companies are using portable GPS and Google maps to undermine indigenous peoples what??

**Question 9**

Who draws maps of their ancestral lands?

**Text number 18**

In order to accurately map the Amazon's biomass and the resulting carbon emissions, it is crucial to classify the growth stages of trees in different parts of the forest. In 2006, Tatiana Kuplich divided Amazon trees into four categories: (1) mature forest, (2) regenerating forest [less than 3 years], (3) regenerating forest [3-5 years of continuous growth], and (4) regenerating forest [11-18 years of continuous growth]. The researcher used a combination of synthetic aperture radar (SAR) and thematic map (TM) to accurately place different parts of the Amazon into one of the four classifications.

**Question 0**

Classification steps, what is important to map aspects of the Amazon?

**Question 1**

Classification of sub-regions of the Amazon forest is important for mapping what types of emissions?

**Question 2**

Who divided the Amazon trees into four categories?

**Question 3**

What year did someone propose to classify Amazon trees into four categories?

**Question 4**

What type of radar was used to classify trees into four categories?

**Question 5**

For what purpose is the classification of tree decay important?

**Question 6**

Who divided the world's trees into four categories?

**Question 7**

What type of radar was used to classify the forest by plant species?

**Question 8**

What was used to classify the Amazon population into four categories.

**Question 9**

What was classified in 2008?

**Text number 19**

In 2005, parts of the Amazon basin experienced the worst drought in 100 years, and there were indications that 2006 could have been a second consecutive year of drought. An article in the British newspaper The Independent on 23 July 2006 reported the findings of the Woods Hole Research Center that the forest in its current form could only withstand three years of drought. Researchers at Brazil's National Amazonian Research Institute argue in the article that this drought and the effects of deforestation on regional climate are driving the rainforest towards a 'tipping point' where it will begin to die irreversibly. They say the forest is turning into savannah or desert, with catastrophic consequences for the world's climate.

**Question 0**

What year did the Amazon experience the worst drought in recent history?

**Question 1**

Which organisation predicted that the Amazon forest would only survive a three-year drought?

**Question 2**

Which organisation claimed that drought, among other effects, could cause a "tipping point" in the Amazon forest?

**Question 3**

What is the other factor besides drought that is driving the Amazon rainforest towards a tipping point?

**Question 4**

What might become of the Amazon forest if it crosses a tipping point and starts to die?

**Question 5**

What year was the worst drought in the Amazon basin in 1000 years?

**Question 6**

Which organisation predicted that the Amazon could survive a drought lasting more than three years?

**Question 7**

Drought and overpopulation are pushing the power towards what?

**Question 8**

The rainforest died there would be little effect on what?

**Question 9**

What replaced savannah and desert in the Amazon?

**Text number 20**

In 2010, the Amazon rainforest again experienced a severe drought, in some ways more extreme than the drought of 2005. The area affected was about 1 160 000 square miles (3 000 000 km2) of rainforest, compared to 734 000 square miles (1 900 000 km2) in 2005. The 2010 drought had three epicentres where vegetation died, while the 2005 drought was concentrated in the southwest. The results were published in the journal Science. In a typical year, the Amazon absorbs 1.5 gigatonnes of carbon dioxide; in contrast, 5 gigatonnes were released in 2005 and 8 gigatonnes in 2010.

**Question 0**

What year did the Amazon experience a drought that may have been more extreme than in 2005?

**Question 1**

How many square kilometres of land were affected by the 2010 drought?

**Question 2**

In how many areas did vegetation die during the 2010 drought?

**Question 3**

In which year was the southern part of the Amazon forest most affected by the drought?

**Question 4**

How many tonnes of carbon are absorbed in the Amazon in a typical year?

**Question 5**

The Amazon rainforest experienced another mild drought in what year?

**Question 6**

How much carbon dioxide is released by Amazon each year?

**Question 7**

In the 2010 drought there were three what vegetation increased?

**Question 8**

How much carbon dioxide was sequestered by power in 2005?

**Question 9**

In 2010, the forces absorbed 8 Gt of what

**Document number 453**

**Text number 0**

Ctenophora (/tᵻˈnɒfərə/; singular ctenophore, /ˈtɛnəfɔːr/ or /ˈtiːnəfɔːr/; Greek κτείς kteis 'comb' and φέρω pherō 'to carry'; commonly known as comb jellies) is a family of animals that live in marine waters worldwide. They are the largest animals that swim with combs, and their most distinctive feature is the combs they use for swimming. Adult individuals of the various species range in size from a few millimetres to 1.5 metres (4 ft 11 in). Like molluscs, their bodies are composed of a jelly mass with one layer of cells on the outside and another lining the inner cavity. In ctenophores these layers are two cells deep, whereas in molluscs they are only one cell deep. Some authors have combined ctenophores and molluscs into a single phylum, Coelenterata, because both groups depend on the flow of water through the body cavity for both digestion and respiration. A growing awareness of the differences led more recent authors to classify them as separate tribes.

**Question 0**

What is a ctenophora?

**Question 1**

What does ctenophora use to swim?

**Question 2**

What does ctenophora use for digestion and respiration?

**Question 3**

How big can a ctenophora grow?

**Question 4**

What is the specificity of ctenophores?

**Question 5**

By what name are ctenophores commonly known?

**Question 6**

How big can a ctenophora grow?

**Question 7**

What does ctenophora rely on for digestion and respiration?

**Question 8**

What does ctenophora mean in Greek?

**Question 9**

Where do ctenophores live?

**Question 10**

What is the common name for molluscs?

**Question 11**

What is special about molluscs?

**Question 12**

What do molluscs use their combs for?

**Question 13**

How are groups of ciliates to be classified, now that there is a growing awareness of the differences?

**Question 14**

How many species of molluscs have been found worldwide?

**Text number 1**

Almost all ctenophores are predators, and their prey ranges from microscopic larvae and reptiles to small crustacean adults, with the exception of juveniles of two species that live as parasites in the salps where the adults of their species live. Under favourable conditions, ctenophores can eat ten times their own weight in a day. Only 100-150 species have been validated, and possibly 25 others have not yet been fully described and named. Textbook examples include cydippids, which have an egg-shaped body and a pair of retractable tentacles flanked by tentillas ("little tentacles") covered with colloblasts, sticky cells that catch prey. Body shapes vary widely, including flattened deep-sea platyctenids, which lack combs in most adults, and coastal beroids, which lack tentacles and prey on other ctenophores with huge mouths with large, stiffened ciliated cilia that act like teeth. These differences allow the different species to form huge populations in the same area, because they specialise in different types of prey, which they catch using methods as varied as those used by spiders.

**Question 0**

How many species of Ctenophora have been validated?

**Question 1**

What are the small tentacles that cydippids have called?

**Question 2**

How much food does a ctenophora eat per day?

**Question 3**

What do coastal beroids lack that other ctenophores have?

**Question 4**

What do the coastal Beriods use as teeth?

**Question 5**

How much ctenophore to eat per day?

**Question 6**

What are the small tentacles of the Cydippids called?

**Question 7**

What do Beriods use as teeth?

**Question 8**

What do Cydippids use to catch their prey?

**Question 9**

How many different species of ctenohore are there?

**Question 10**

How do reptiles behave when looking for a meal?

**Question 11**

How much can a rotifer eat per day?

**Question 12**

How many species of fungi have been found?

**Question 13**

How many species of mushrooms have not yet been named?

**Question 14**

What do some mushroom species do instead of being predators?

**Text number 2**

Most species are hermaphrodites - one animal can produce both eggs and sperm, which means it can fertilise its own eggs and does not need a mate. Some are simultaneous hermaphrodites, which can produce both eggs and sperm at the same time. Others are sequential hermaphrodites, in which the eggs and sperm mature at different times. Fertilisation usually occurs externally, although platyctenid eggs are fertilised inside the body of their parents and remain there until hatching. The young are usually planktonic, and in most species they look like miniature cydippids that gradually change to adult form as they grow. Exceptions are beroids, whose young are miniature beroids with a large mouth and tentacles, and platyctenids, whose young live as cydippid-like plankton until they reach almost adult size, but then sink to the bottom and rapidly change to adult form. In at least some species, juveniles are able to reproduce before reaching adult size and shape. The combination of hermaphroditism and early reproduction allows small populations to grow exponentially.

**Question 0**

What is unique about hermaphrodite?

**Question 1**

What can concurrent hermaphrodite do?

**Question 2**

What type of hermaphrodite produces eggs and sperm at different times?

**Question 3**

Which species' eggs are fertilised and remain inside the body of the parents until hatching?

**Question 4**

What is causing the ctenophora population to explode?

**Question 5**

What is hermaphrodite?

**Question 6**

What is unique about simultaneous hermaphrodites?

**Question 7**

What is the characteristic of successive hermaphrodites?

**Question 8**

Which group of eggs are fertilised and kept in the body of the parent until they hatch?

**Question 9**

Which group of chicks are born without tentacles and with a large mouth?

**Question 10**

How does plankton reproduce?

**Question 11**

How does a plankton fertilise its eggs?

**Question 12**

What happens to plankton as it matures?

**Question 13**

When are some young plankton able to make it before they become adults?

**Question 14**

How fast are plankton populations growing thanks to hermaphroditism and early reproduction?

**Text number 3**

Ctenophores can be abundant in the summer months in some coastal areas, but in other places they are rare and hard to find. In bays where they are very abundant, the predation of ctenophores can suppress populations of small zooplankton organisms, such as copepods, that might otherwise destroy a vital part of the marine food chains, phytoplankton (planktonic plants). One ctenofora, Mnemiopsis, has been accidentally introduced into the Black Sea, where it is blamed for the collapse of fish stocks because it eats both fish larvae and organisms that would otherwise have fed on the fish. The situation was exacerbated by other factors, such as overfishing and long-term environmental changes, which contributed to the growth of Mnemiopsis. The later accidental introduction of Beroe helped to alleviate the problem, as Beroe preys on other ctenophores.

**Question 0**

What does Beroe eat?

**Question 1**

What was brought into the Black Sea?

**Question 2**

What does mnemiopsis eat?

**Question 3**

Where is ctenophor present in high amounts?

**Question 4**

Where is ctenophor present in high amounts?

**Question 5**

What are phytoplankton?

**Question 6**

Which ctenophore has been accidentally planted in the Black Sea?

**Question 7**

Which event was blamed for the introduction of mnemiopsis into the Black Sea?

**Question 8**

What was done to combat overpopulation of mnemiopsis in the Black Sea?

**Question 9**

When are water lizard populations abundant?

**Question 10**

In which areas do copepods thrive?

**Question 11**

How common are copepods elsewhere?

**Question 12**

Where in the sea have the copepods been accidentally released?

**Question 13**

What is the one thing that copepods like to eat?

**Text number 4**

Despite their soft, jelly-like bodies, fossils believed to represent ctenophores, apparently lacking tentacles but with much more comb lines than present forms, have been found in lagers from as far back as the early Cambrian, around 515 million years ago. The role of ctenophores in the evolutionary phylogeny of animals has long been debated, and the majority view, based on molecular phylogenetics, is currently that molluscs and twins are more closely related to each other than to either ctenophore. A recent analysis of molecular phylogenetics concluded that all modern ctenophores shared a common ancestor with cydippids and that all modern groups appeared relatively recently, probably after the Cretaceous-Paleogene extinction of 66 million years ago. Evidence accumulated since the 1980s shows that 'cydippids' are not monophyletic, i.e. they do not contain all and only one common ancestor, since all other traditional ctenophore groups are descendants of different cydippids.

**Question 0**

When did the extinction between the Cretaceous and the Palaeogene occur?

**Question 1**

Evidence shows that Cydippids are not what?

**Question 2**

How old are the fossils of ctenophores that have been found?

**Question 3**

What was missing from the fossils that were found to represent ctenfor, what do modern ctenfors have?

**Question 4**

How old were the fossils found that were believed to be ctenophores?

**Question 5**

Which event happened 66 million years ago?

**Question 6**

Cypiddides are not what?

**Question 7**

What do modern ctenophores have that fossils didn't have?

**Question 8**

In which period were lagerstatten first discovered?

**Question 9**

To what do molecular biologists believe lager statins are closely related?

**Question 10**

What were the characteristics of the common ancestor of the lagerstatten?

**Question 11**

After which event is the lagerstatten believed to have appeared?

**Question 12**

What are the descendants of the lager statins?

**Text number 5**

Ctenophores form a family of animals that is more complex than fungi, about as complex as molluscs (jellyfish, sea anemones, etc.) and less complex than bipeds (which include almost all other animals). Unlike fungi, both ctenophores and molluscs have cells connected by intercellular connections and a mat-like basement membrane, muscles, nervous system and some have sensory organs. Ctenophores differ from all other animals in having colloblasts, which are sticky and adhere to prey, although some ctenophore species lack them.

**Question 0**

Which tribe do jellyfish and sea anemones belong to?

**Question 1**

What distinguishes ctenophores from all other animals?

**Question 2**

Ctenophores are less complex than what other tribe?

**Question 3**

Which of the tribes is more complex than mushrooms?

**Question 4**

What does ctenophore use to catch prey?

**Question 5**

To which group do jellyfish and sea anemones belong/

**Question 6**

What do ctenophores have that other animals don't?

**Question 7**

What do ctenophores use to catch their prey?

**Question 8**

Which two groups of cells are connected by cell-to-cell connections and membranes, muscles, nervous system and sensory organs?

**Question 9**

Ctenophores are less complex than which other group?

**Question 10**

What connections bind fungal cells?

**Question 11**

What kind of organs do some mushrooms have?

**Question 12**

What distinguishes fungi from all other animals?

**Question 13**

What do fungi use their colloblasts for?

**Question 14**

Which sticky cells used to catch prey are missing in some mushroom species?

**Text number 6**

Like fungi and molluscs, ctenophores have two main cell layers with a middle layer of jelly-like substance called mesoglea in molluscs and ctenophores; more complex animals have three main cell layers and no jelly-like interlayer. This is why ctenophores and molluscs have traditionally been called diploblastic, as have fungi. Both ctenophores and molluscs have a muscle type that, in more complex animals, arises from the middle cell layer, which is why some recent textbooks classify ctenophores as triploblastic, while others still consider them diploblastic.

**Question 0**

What is the name of the jelly susb dance?

**Question 1**

Which group are ctenophores and molluscs in?

**Question 2**

Which group has two layers of cells with a mesoglea in the middle?

**Question 3**

Ctenophores, molluscs and which other group are classified as diploblastic?

**Question 4**

Mushrooms have three main cell layers and no what?

**Question 5**

Where does the jelly-like layer of complex animals come from?

**Question 6**

What is the name given to more complex animals when they have a gelatinous layer?

**Question 7**

What is the lack of a gelatinous layer, also called when in a complex animal?

**Question 8**

How many cell layers, with a gelatinous layer in between, do complex animals have?

**Text number 7**

Ctenophores range in size from about 1 millimetre to 1.5 metres (4.9 feet) and are the largest non-colonial animals that use hair as their main method of locomotion. Most species have eight strips, called comb-lines, running the length of their body, with comb-like bands of cilia, called "ctene", stacked along the comb-lines so that when the cilia beat, the cilia of each comb touch the comb below. The name 'ctenophora' means 'comb', the Greek κτείς (stem form κτεν-) meaning 'comb', and the Greek suffix -φορος meaning 'bearing'.

**Question 0**

What is the name given to the hairs of ctenophores?

**Question 1**

What are cilia used for?

**Question 2**

What are called comb-like bands of cilia?

**Question 3**

What does ctenophore mean in Greek?

**Question 4**

How many different types of cilia are there?

**Question 5**

How long can cilli grow on ctenofor?

**Question 6**

What do lashes use their bodies for?

**Question 7**

What are also the names of the cilia bodies?

**Question 8**

What kind of animals are cavies considered to be?

**Text number 8**

For a family with relatively few species, ctenophores have a wide range of body structures. Coastal species must be tough enough to withstand waves and swirling sediment particles, while some ocean species are so fragile that they are very difficult to capture intact for study. In addition, ocean species are poorly preserved and are mainly known from photographs and observers' notes. As a result, until recently most attention has focused on three coastal genera - Pleurobrachia, Beroe and Mnemiopsis. At least two textbooks base their descriptions of ctenophores on the Pleurobrachia genus.

**Question 0**

Which cidippide is used in most textbooks to describe ctenophores?

**Question 1**

Which group of ctenophores is the most difficult to study?

**Question 2**

Why are coastal species hardy?

**Question 3**

Which ctenophores have been studied the most?

**Question 4**

What kind of sediment particles are there?

**Question 5**

In which areas are sediment particles typically found?

**Question 6**

What usually transports sediment particles from one place to another?

**Question 7**

What three different types of sediment particles have been found?

**Question 8**

How many types of sediment particles have received the most attention recently?

**Text number 9**

The internal cavity consists of: the mouth, which can usually be closed by muscles, the pharynx ("throat"), the larger area in the middle that acts as the stomach, and the system of internal ducts. These branch through the mesoglea to the most active parts of the animal: the mouth and pharynx, the roots of the tentacles, if present, below each cranial rib, and four branches around the sensory complex at the end of the mouth - two of these four branches terminate in the pores of the anus. The inner surface of the cavity is lined with an epithelium, the gastrodermis. The mouth and pharynx contain both cilia and well-developed muscles. In other parts of the duct, the gastrodermis is different on the sides nearest and furthest from the organ it feeds. The proximal side is composed of high nutrient cells that store nutrients in vacuoles (internal compartments), germ cells that produce oocytes or sperm, and photosynthetic cells that produce bioluminescence. The side furthest from the foreskin is covered by the ciliated cells, which circulate water in ducts interspersed with ciliary rosettes, pores surrounded by double ciliary bodies and connected to the mesoglea.

**Question 0**

What's inside the ctenophore?

**Question 1**

What do photosynthetic cells produce?

**Question 2**

What is the name of a cucumber?

**Question 3**

What does the internal cavity contain?

**Question 4**

What are the most active parts of the ctenophore?

**Question 5**

What are the tentacles lined with?

**Question 6**

What can be used to close mesoglea?

**Question 7**

Below which is the mesoglea located?

**Question 8**

Where does mesoglea end?

**Question 9**

Where is the mesoglea different in other parts of the canal system?

**Text number 10**

The outer surface usually has eight rows of cranks, called floating discs, which are used for swimming. The rows run from near the mouth (oral navel) to the opposite end (aboral navel) and are more or less evenly spaced around the body, although the spacing varies from species to species, and in most species the comb rows extend only part way from the aboral navel towards the mouth. The combs (also called ctenes or comb plates) run across each row, each consisting of thousands of unusually long cilia up to 2 mm long. Unlike the usual filaments and flagella, whose filament structure is arranged in a 9+2 pattern, these filaments are arranged in a 9+3 pattern, with an additional dense filament suspected of acting as a support. These usually pulsate so that the thrust is away from the mouth, although they can also reverse direction. So, unlike jellyfish, ctenophores usually swim in the direction the mouth is pointing. In an attempt to escape predators, one species may accelerate to six times its normal speed; some other species reverse direction as part of their escape behaviour by reversing the power transmission of the cranial plates.

**Question 0**

What is the name of the eight rows of cranks on the outside?

**Question 1**

What are the names of the combs?

**Question 2**

What are 9 +3 patterned cilia thought to do?

**Question 3**

Which way do ctenophores swim?

**Question 4**

How long can eyelashes be?

**Question 5**

What are flagpoles called?

**Question 6**

How many different types of flags are there?

**Question 7**

How long can flagellates grow?

**Question 8**

In which direction do the cilia usually swim?

**Question 9**

What kind of behaviour do the crows of the field engage in when they turn their flagstaffs?

**Text number 11**

It is uncertain how ctenophores regulate their buoyancy, but experiments have shown that some species use osmotic pressure to adapt to water of different densities. Their body fluids are usually as concentrated as seawater. If they are exposed to less dense brackish water, ciliated rosettes in the body cavity can pump it into the mesoglea to increase its volume and decrease its density so that they do not sink. If, on the other hand, they move from brackish water to full-strength seawater, the rosettes can pump water out of the mesoglea to reduce its volume and increase its density.

**Question 0**

How do ctenophores control buoyancy?

**Question 1**

Where do the rosettes in the halo pump water to regulate buoyancy?

**Question 2**

What does pumping water into the mesoglea do?

**Question 3**

What are the rosettes of the ciliary body doing to reduce bulk and increase density?

**Question 4**

How does mesoglea control how fluids in the body are broken down?

**Question 5**

What does mesoglea adapt to when it is dependent on brackish water?

**Question 6**

What is the volume that is usually as dense as?

**Question 7**

What does pumping ordinary seawater do to its mass?

**Question 8**

Why does the density of corolla rosettes have to decrease in seawater?

**Text number 12**

The largest single sensory element is the aboral organ (at the opposite end of the mouth). Its main component is the statocyst, a balance sensor consisting of a statolite, a solid particle supported by four barbed coils called "balancers" that sense its direction. The statocyst is protected by a transparent dome made of long, immobile hairs. The ctenophore does not automatically try to keep the statolite evenly supported by all the balancers. Instead, its response is determined by the "mood" of the animal, i.e. the general state of the nervous system. For example, if a ctenophore with its tentacles pulling behind it catches a prey, it will often put some of its crank arms in reverse and rotate its mouth towards the prey.

**Question 0**

What is the main sensory trait of ctenophora animals?

**Question 1**

Where is the aboral organ located?

**Question 2**

What protects the statice?

**Question 3**

What is the main component of the aboral organ?

**Question 4**

What is a statocyst?

**Question 5**

What is the biggest feature of the mouth?

**Question 6**

What protects the nervous system?

**Question 7**

What is the nervous system made of?

**Question 8**

On what do the lashes tend to keep the transparent dome resting?

**Question 9**

What determines whether the tentacles are on the balancers or not?

**Text number 13**

The bodies of Cydippid ctenophora are more or less round, sometimes almost spherical and sometimes more cylindrical or egg-shaped; the common coastal "sea hornet", Pleurobrachia, sometimes has an egg-shaped body with a mouth at the narrow end, although some individuals are more evenly rounded. From opposite sides of the body emerge a pair of long, slender tentacles, each with a sheath into which it can be drawn. The bodies of some species of cydippids are variously flattened so that they are wider at the level of the tentacles.

**Question 0**

What is the name of the common coastal pleurobrachia?

**Question 1**

What does a pleurobrachia have on the opposite sides of its body?

**Question 2**

Cydippids are typically what shape?

**Question 3**

What protects the long tentacles of a pleurbrachia?

**Question 4**

Where is the mouth of a pleuobrachia located?

**Question 5**

Where is the mouth of a pleuobrachia kept?

**Question 6**

What can a pleuobrachia do with its mouth when it's in the way?

**Question 7**

What happens to some cydippid sheaths to change their size?

**Question 8**

Are the sheaths wider or narrower near the entrance?

**Question 9**

What is another name for a cup into which the mouth can be withdrawn?

**Text number 14**

Cydippid tentacles are typically flanked by tentilles ("small tentacles"), although some families have simple tentacles without these side branches. The tentacles and tentacles are densely covered with microscopic colloblasts, which attach to prey by grasping it. Colloblasts are specialised sponge-shaped cells in the outermost layer of the epidermis and have three main components: a dome-shaped head with vesicles (chambers) containing adhesive substances; a stem that anchors the cell to the lower layer of the epidermis or mesoglea; and a spiral that wraps around the stem and is attached to the head and the root of the stem. The function of the thread is not clear, but it may dampen stress when the prey tries to escape, preventing the collobast from tearing apart. In addition to colloblasts, members of the genus Haeckelia, which feed mainly on jellyfish, incorporate stinging nematocytes into the tentacles of their prey - some mollusc-eating nudibranchs similarly incorporate nematocytes into their bodies for defence. The tentacles of euplokamis differ significantly from those of other cydippids: they have striated muscles, a cell type not otherwise known in the genus Ctenophora, and are coiled in a relaxed manner, whereas the tentacles of all other known ctenophores are stretched in a relaxed manner. The tentacles of euploquamids move in three different ways used to catch prey: they can swing very quickly (40-60 milliseconds); they can wriggle, which can attract prey by behaving like small plankton worms; and they wrap around prey. The unique flapping movement is a coiling movement, powered by contraction of striated muscle. The wriggling movement is produced by smooth muscles, but they are of a very specialized type. Wrapping around the prey is largely accomplished by returning the tentacles to their inactive state, but smooth muscle can tighten the coils.

**Question 0**

What kind of tentacles usually border the tentacles of cydipped ctenophores?

**Question 1**

What are colloblasts?

**Question 2**

What distinguishes euplokamisin tentacles from other cycippids?

**Question 3**

How many different movements are there in euplokamis-tentillas?

**Question 4**

What does euplokamis use these three types of business for?

**Question 5**

What borders the epidermis?

**Question 6**

What is the typical format of exams?

**Question 7**

How many components are there in the exams?

**Question 8**

What is the dome-shaped head of a tentacle?

**Question 9**

What do the vesticles in the exams contain?

**Text number 15**

Eight rows of combs run from near the mouth to the opposite end, and are evenly spaced around the body. The combs beat in a metachronous rhythm that resembles the rhythm of a Mexican wave. From each of the balancers of the statocyst emanates a radial groove under the dome, which splits and joins the two adjacent rows of cranks, and in some species runs the full length of the rows of cranks. A mechanical system is thus formed which transmits the rhythm from the combs to the balancers by means of the water disturbances caused by the spacer hairs.

**Question 0**

How many rows of combs are there?

**Question 1**

Where are the camping vests located?

**Question 2**

How are the combs positioned?

**Question 3**

What runs from the statostatic balancer to the comb line?

**Question 4**

How many rows of statocysts are there?

**Question 5**

What is the rhythm of the statocysts?

**Question 6**

How are the statocysts distributed?

**Question 7**

Where are the statokystas aligned when they are evenly spaced?

**Question 8**

Where does the statoxy crack to join?

**Text number 16**

The lobata have a pair of lobes, which are muscular, cup-shaped extensions of the body that protrude outside the mouth. Their inconspicuous tentacles emanate from the corners of the mouth, run in sinuous grooves and extend to the inner surface of the tentacles (instead of staying far back, as in Cydippidae). Between the tentacles on either side of the mouth, many species of tentacles have four auricles, which are gelatinous projections flanked by spacer hairs that produce water currents that help direct microscopic prey towards the mouth. This combination of structures allows the locusts to continuously feed on planktonic prey.

**Question 0**

What to lobby for in a couple?

**Question 1**

What are earlobes?

**Question 2**

How many earlobes do most species have?

**Question 3**

What do the earlobes do?

**Question 4**

What do lobats eat?

**Question 5**

How many lobes does plankton have?

**Question 6**

How often does plankton need to feed?

**Question 7**

What are planktonic lobates?

**Question 8**

How many auricles does plankton have?

**Question 9**

How do plankton tentacles help them find their prey?

**Text number 17**

Lobates have eight rows of combs, which originate from the aboral navel and do not usually extend outside the body into the lobes; in species with (four) auricles, the spacers flanking the auricles are extensions of the four rows of spacers. Most lobates are rather passive when moving in the water and use the spacers of their comb rows as propulsion, although Leucothea has long and active earlobes, whose movements also contribute to propulsion. Members of the genera Bathocyroe and Ocyropsis can escape danger by slamming their hips together, whereby they are propelled backwards very quickly by the outgoing jet of water. Unlike cydippids, the movements of the lobate combs are coordinated by water shocks generated by the nerves rather than the cilia, but the combs of the same row beat in the same Mexican wave style as the mechanically coordinated comb lines of cydippids and beroids. This may have allowed the lobates to grow larger than the cydippids and to have a less egg-like shape.

**Question 0**

What do bathocyroe and ocyropsis do to escape danger?

**Question 1**

What happens when bathocyroe and ocyropsis clap their tentacles together?

**Question 2**

What controls the movements of the lobates?

**Question 3**

What do Cydippid combs control?

**Question 4**

How many segments does a cilia have?

**Question 5**

What are most cobwebs like when moving through water?

**Question 6**

What kind of lugs do the cilia have?

**Question 7**

How do cavies and aborals escape danger?

**Question 8**

What happens when the cilia and arboles meet their blocks?

**Text number 18**

The Beroida, also known as the Nuda, lacks a feeding gland, but has a "macrocilia" at the end of its mouth in its large pharynx, which is just inside the large mouth and fills most of the pouch-like body. These fused bundles of several thousand large cilia are capable of "biting off" pieces of prey too large to be swallowed whole - almost always other ctenophores. In front of the macrocilia, on the mouth 'lips' of some Beroe species, are a pair of narrow bands of adhesive epithelial cells in the stomach wall that 'zip' the mouth closed when the animal is not eating, forming intercellular junctions with the opposite adhesive epithelial cell. This tight closure streamlines the front of the animal as it chases prey.

**Question 0**

Beroida is known by what other name?

**Question 1**

Which group has no feeding organs?

**Question 2**

Some species of beroe have a pair of adhesive bands in the stomach wall, which are made up of adhesive cells. What does it do?

**Question 3**

What does a beroe do when it is chasing prey?

**Question 4**

What does beroida have instead of feeding muscles?

**Question 5**

What's one thing that pubic hair doesn't have?

**Question 6**

What epithelial cells fill most of Nuda?

**Question 7**

What do epithelial cells have at the end of the mouth?

**Question 8**

What can epithelial cells do if the prey is too big to swallow?

**Question 9**

What does the big swallow do in Beroe when it's not eating?

**Text number 19**

Cestida ("armadillos") are ribbon-shaped planktonic animals with the mouth and aboral organ in the middle of opposite sides of the ribbon. Each aboral edge has a pair of comb rows, and tentacles run the length of the mouth edge, flowing back along most of the wing-like body surface. Cestids can swim by swinging their bodies and by hitting the cranial line. There are two known species and they are found worldwide in warm and warm temperate waters: Cestum veneris ('Venus' waist') is one of the largest ctenophores - it is up to 1.5 metres long and can sway slowly or quite rapidly. Velamen parallelum, typically less than 20 centimetres long, can move much faster, in what has been described as a "darting motion".

**Question 0**

Which species are ribbon-like plankton?

**Question 1**

What is the name of cestida?

**Question 2**

How do cestids swim?

**Question 3**

What is the biggest ctenophore?

**Question 4**

Which species moves in a darting motion?

**Question 5**

How long is Aboral?

**Question 6**

How does Aboral move?

**Question 7**

What is another name for Aboral?

**Question 8**

What shape is Aboral usually in?

**Question 9**

Where is the mouth of Aboral located?

**Text number 20**

Most Platyctenida have an oval body, flattened between the mouth and the aorta, with a pair of tentacle-bearing tentacles on the surface of the aorta. They cling to surfaces and crawl on surfaces by turning the pharynx outwards and using it as a muscular 'foot'. All but one of the known platyctenid species lack crank rows. Platyctenids are usually cryptic in colour, live on rocks, algae or other invertebrate body surfaces, and are often revealed by long tentacles with many lateral branches that appear to flow from the dorsum of the ctenophore to the stream.

**Question 0**

What do most platyctenida have on the aboral surface?

**Question 1**

What does Platyctenida use its pharynx for?

**Question 2**

What is missing in all but one of the platycenida species?

**Question 3**

Where does platycenida live?

**Question 4**

What does Aboral use its rows of combs for?

**Question 5**

What is the shape of Aboral's body?

**Question 6**

How many tentacles does Aboral have in its throat?

**Question 7**

What is missing from all but one Aboral?

**Question 8**

Where does Aboral usually live?

**Text number 21**

Almost all species are hermaphrodites, i.e. they act as both male and female at the same time - except for two species of Ocryopsis, whose individuals remain the same sex throughout their lives. The gonads are located in parts of the internal ductal network under the rows of combs, and the eggs and sperm are released through pores in the epidermis. In most species fertilisation is external, but platyctenids use internal fertilisation and keep the eggs in the nest chambers until they hatch. Self-fertilisation has sometimes been observed in species of the genus Mnemiopsis, and most hermaphroditic species are believed to be self-fertile.

**Question 0**

How are oocytes and sperm released?

**Question 1**

How do platyctenids reproduce?

**Question 2**

In which family has self-fertilisation been observed?

**Question 3**

Where are the gonads located?

**Question 4**

Is fertilisation in most species internal or external?

**Question 5**

What do most species of the genus Ocryopsis do at the same time?

**Question 6**

In what kind of chamber do Ocryopsis species keep their eggs until hatching?

**Question 7**

What is released from the pores of the comb lines?

**Question 8**

What has ever been observed in species of the genus Ocryopsis?

**Question 9**

What are most species of the genus Ocryopsis thought to be?

**Text number 22**

Fertilised eggs develop directly, i.e. they do not have a distinct larval form, and juveniles of all groups usually resemble miniature cydippid adults. Young individuals of the genus Beroe, like adults, do not have tentacles or tentacle pupae. In most species, juveniles gradually develop the body forms of their parents. In some groups, such as the flat, bottom-dwelling platyctenids, juveniles behave more like true larvae because they live among plankton and are thus in a different ecological range from their parents, reaching adult form by a more radical metamorphosis after falling to the seafloor.

**Question 0**

What are young and adult beros missing?

**Question 1**

Where do young platyctenids live?

**Question 2**

When do young people become adults?

**Question 3**

Young platyctenids behave like what?

**Question 4**

Which family is missing tentacles and sheaths?

**Question 5**

How does the caterpillar develop?

**Question 6**

What do bottom-dwelling platyctenids usually lack, like adults?

**Question 7**

How do young Beroe individuals behave?

**Question 8**

Among which Beroe animals do they usually live young?

**Question 9**

What kind of area do Beroe youngsters live in that is different from that of their parents?

**Text number 23**

When some species, such as Bathyctena chuni, Euplokamis stationis and Eurhamphaea vexilligera, are disturbed, they produce secretions (ink) that luminesce at much the same wavelengths as their bodies. Young animals glow more brightly in proportion to their body size than adult animals, whose luminescence is scattered throughout their bodies. Detailed statistical studies have given no indication of the function of ctenophores' bioluminescence, nor have they provided any correlation between its exact colour and any environmental factors such as depth or whether they live in coastal or mid-ocean waters.

**Question 0**

What do Bathyctena chun, Euplokamis stationis and Eurhamphaea vexilligera have in common?

**Question 1**

When do Bathyctena chuni, Euplokamis stationis and Eurhamphaea vexilligera excrete?

**Question 2**

What is the common name for excreta?

**Question 3**

Is the luminescence of adult or juvenile secretions brighter?

**Question 4**

What do Bathyctena chuni, Euplokamis stationis and Euhamphaea veilligera produce only when they change colour?

**Question 5**

Are most ctenophores the same colour or different colours?

**Question 6**

What happens to seawater when it absorbs certain wavelengths?

**Question 7**

How does seawater affect the luminescence of certain animals?

**Question 8**

What is the evidence that ctenophores release in their environment?

**Text number 24**

Almost all ctenophores are predators - there are no herbivores, and only one genus is partially parasitic. If food is plentiful, they can eat 10 times their own weight in a day. Beroe prey mainly on other ctenophores, but other surface water species prey on zooplankton (planktonic animals) ranging in size from microscopic animals such as mollusc and fish larvae to small adult crustaceans such as copepods, amphipods and even krill. Members of the genus Haeckelia prey on jellyfish and incorporate the nematocysts (stinging cells) of their prey into their tentacles instead of colloblasts. Ctenophores have been compared to spiders for their many different predatory techniques - some hang motionless in the water using their tentacles as 'webs', some are ambush predators like salticid jumping spiders, and some dangle a sticky droplet on the end of a fine thread, as bolas spiders do. This diversity explains the wide range of body shapes in a tribe with relatively few species. The bipedal "cydippid" Lampea feeds exclusively on salps, which are close relatives of sea spiders and form large chain-like floating colonies, and young Lampea spiders attach themselves as parasites to salps that are too large for them to swallow. Members of the Pleurobrachia and Bolinopsis genera often reach high population densities in the same place and at the same time, because they specialise in different types of prey: the long tentacles of Pleurobrachia predominantly catch relatively strong swimmers such as adult aquatic turtles, while Bolinopsis usually feed on smaller, weaker swimmers such as sponge limpets and mollusc and crustacean larvae.

**Question 0**

Are ctenophores predators, herbivores or parasites?

**Question 1**

Haeckelia preys mainly on what animal?

**Question 2**

What happens to jellyfish nematocysts when they are eaten by haeckelia?

**Question 3**

What does a bolinopsis usually eat?

**Question 4**

What is the name of the cydipteran cydippid that lives in the salps?

**Question 5**

How much food can crustacean larvae eat in a day?

**Question 6**

What do zooplankton usually prey on?

**Question 7**

What do members of the Haeckelia family usually capture in the adult version?

**Question 8**

On which smaller, weaker swimmers do amphipods live?

**Question 9**

What does Pleurobrachia include in its own tentacles?

**Text number 25**

Ctenophores used to be considered "dead ends" in marine food chains because their low organic matter and salt/water ratios were thought to make them poor food for other animals. Ctenophores' remains are also often difficult to identify in the gut of potential predators, although combs sometimes remain intact long enough to provide clues. Detailed studies of the chum salmon, Oncorhynchus keta, showed that these fish digest ctenophores 20 times faster than shrimp of the same weight, and that ctenophores can be good food if they are present in sufficient quantities. Beroids prey mainly on other ctenophores. Some jellyfish and turtles eat large quantities of ctenophores, and jellyfish can temporarily wipe out ctenophore populations. As ctenophores and jellyfish populations are often highly seasonal, most of the fish that prey on them are generalists and may have a greater impact on populations than jellyfish specialist jellyfish eaters. This is underlined by the observation of herbivorous fish deliberately feeding on jellyfish zooplankton during Red Sea blooms. The larvae of some sea anemones are parasitic on ctenophores, as are the larvae of some flatworms that parasitise fish as they mature.

**Question 0**

Why was it thought that ctenophores were bad food for other animals?

**Question 1**

What is the name of oncorhynchus?

**Question 2**

What do beroids usually eat?

**Question 3**

Where have herbivorous fish been seen feeding on jelly-like zooplankton?

**Question 4**

What can turtles and jellyfish eat in large quantities?

**Question 5**

What was salmon used to be considered in marine food chains?

**Question 6**

Where is it difficult to identify salmon remains?

**Question 7**

How fast do shrimps digest ctenophor compared to other prey species?

**Question 8**

What kind of food can salmon provide for other predators?

**Question 9**

What kind of populations can be temporarily wiped out by shrimps?

**Text number 26**

On the other hand, in the late 1980s, the western Atlantic ctenophore Mnemiopsis leidyi was accidentally introduced into the Black Sea and Sea of Azov via ships' ballast tanks, and has been blamed for a drastic decline in fish catches because it feeds on both fish larvae and small crustaceans that would otherwise feed on adult fish. Mnemiopsis is well equipped to conquer new areas (although this was not predicted until it had so successfully colonised the Black Sea), being able to reproduce very rapidly and tolerate a wide range of water temperatures and salinities. The impact was compounded by chronic overfishing and eutrophication, which provided a short-term boost to the whole ecosystem and caused the Mnemiopsis population to grow even faster than normal - and above all by the lack of efficient predators for the ctenophores that entered the area. Mnemiopsis populations in these areas were finally brought under control when the North American ctenophore Beroe ovata, which feeds on Mnemiopsis, was accidentally introduced and when the local climate cooled between 1991 and 1993, significantly slowing down the animal's metabolism. However, plankton abundance in the area is unlikely to return to pre-Mnemiopsis levels.

**Question 0**

What is to blame for the sharp decline in fish catches in the Black Sea and Azov Sea?

**Question 1**

How did the ctenophore mnemiopsis leidyi spread to the Black Sea and Sea of Azov?

**Question 2**

When was ctenophore mnemiopsis leidyi planted in the Black Sea and Sea of Azov?

**Question 3**

How were the Black Sea and Azov Sea mnemiopsis populations brought under control?

**Question 4**

How does the cooling of the local environment affect mnemiopsis?

**Question 5**

When were fish larvae accidentally introduced into the Black Sea?

**Question 6**

Where else in the sea have fish larvae accidentally fallen into?

**Question 7**

How did the fish larvae accidentally end up in these two bodies of water?

**Question 8**

What has caused the steep decline in fish larvae?

**Question 9**

How fast can fish larvae grow?

**Text number 27**

Because of their soft, jelly-like bodies, ctenophores are extremely rare as fossils, and fossils interpreted as ctenophores have only been found in lagoons, i.e. places where the environment was exceptionally favourable for the preservation of soft tissues. Until the mid-1990s, only two specimens of good enough quality for analysis were known, both belonging to the crown group and dating from the Early Devonian (Emsian). Subsequently, three other putative species were found in the Burgess Shale and other similar rocks in Canada around 505 million years ago in the Middle Cambrian. All three apparently lacked tentacles, but had 24-80 rows of combs, far more than the 8 rows typical of living species. They also appear to have had internal organ-like structures not found in living ctenophorans. One fossil species, first reported in 1996, had a large mouth, apparently surrounded by a folded edge that may have been muscular. Evidence from China a year later suggests that such ctenophores were widespread in the Cambrian period, but perhaps very different from the species we see today - for example, the comb-lines of one fossil were attached to visible wings. The Eoandromeda of Ediacaran could presumably represent a comb jelly.

**Question 0**

Why are ctenophores extremely rare as fossils?

**Question 1**

Ediacaran eoandromeda can be considered to represent what?

**Question 2**

What was the name of the period 505 million years ago?

**Question 3**

How many species were found in the Burgess Shale?

**Question 4**

What was missing from the fossils found in the Burgess Shale?

**Question 5**

When were the first tentacles formed on the ctenofor?

**Question 6**

How many visible tentacles were found in 1996?

**Question 7**

How long ago was the ediacaran season?

**Question 8**

What kind of structures are typical of living lagoons?

**Question 9**

What year was Edicara's Eoandromeda named?

**Text number 28**

Stromatoveris, an Early Cambrian sessile rim fossil from the Chengjiang deposit in China, dating back to around 515 million years ago, is very similar to the Vendobionta of the preceding Ediacaran period. De-Gan Shu, Simon Conway Morris et al. found what they believed to be filter-feeding dyes in its branches. They proposed that Stromatoveris was the evolutionary 'aunt' of the ctenophores and that the ctenophores were derived from sedentary animals whose descendants became swimmers and who transformed the cilia from a feeding mechanism to a propulsion system.

**Question 0**

How old were the fossils found in China?

**Question 1**

What kind of fossils were found in China?

**Question 2**

Which family is considered to be the "aunt" of the ctenophores?

**Question 3**

Stromatoveris is similar to which family?

**Question 4**

When did Vendobionta live?

**Question 5**

Which family is considered the aunt of the Vendobionta family?

**Question 6**

What period do the feeding mechanisms date back to?

**Question 7**

What did Simon Conway find on the branches of lager trees?

**Question 8**

What became of Vendobionta's descendants?

**Question 9**

Where did Vendobionta's offspring change their colouring?

**Text number 29**

The relationship of ctenophores to other Metazoa is crucial to understanding the early evolution of animals and the origin of multicellularity. It has been debated for many years. Ctenophores have been claimed to be a sister lineage to Bilateria, a sister lineage to Cnidaria, a sister lineage to Cnidaria, Placozoa and Bilateria, and a sister lineage to all other animal families. Several studies examining the presence and absence of members of gene families and signalling pathways (e.g. homeoboxes, nuclear receptors, Wnt signalling pathway and sodium channels) showed that the latter two scenarios, i.e. that ctenophores are either sister lines to Cnidaria, Placozoa and Bilateria or sister lines to all other animal families, are consistent. Several more recent studies comparing the complete sequenced genomes of ctenophores with other sequenced animal genomes have also supported the status of ctenophores as sister lineages to all other animals. This position would suggest that neural and muscle cell types either disappeared from the major animal lineages (e.g. Porifera) or that they evolved independently in the ctenophore lineage. However, other researchers have argued that the placement of Ctenophora as a sister to all other animals is a statistical anomaly due to the high rate of evolution of the ctenophore genomes, and that Porifera (fungi) is instead the earliest diverged animal phylum. Ctenophores and fungi are also the only known animal families lacking any true hox genes.

**Question 0**

Recent studies believe that ctenophores are related to what?

**Question 1**

What do some scientists think is the earliest diverging animal phylum?

**Question 2**

What are all the other animal species missing?

**Question 3**

How do other scientists believe Porifera developed and evolved its neurons?

**Question 4**

Where is Cnidaria sometimes classified instead of Ctenophora?

**Question 5**

What is important to understand about nerve and muscle cell types?

**Question 6**

What has been the focus for many years on the presence of hox genes?

**Text number 30**

Since all modern ctenophores except beroids have cydippid-like larvae, it is widely assumed that their last common ancestor also resembled cydippids, with an egg-shaped body and a pair of retractable tentacles. A purely morphological analysis by Richard Harbison in 1985 concluded that cydippids are not monophyletic, i.e. they do not contain all the descendants of one common ancestor and only one, which was itself a cydippid. Instead, he found that different families of cydippids more closely resembled members of other ctenophore orders than other cydippids. He also suggested that the last common ancestor of modern ctenophores was either a cydippid or a beroid. A 2001 molecular phylogeny analysis using 26 species, including four recently discovered species, confirmed that cydippids are not monophyletic and concluded that the last common ancestor of modern ctenophores was cydippid-like. It also found that the genetic differences between these species were very small - so small that the relationships between Lobata, Cestida and Thalassocalycida remained uncertain. This suggests that the last common ancestor of modern ctenophores was relatively recent, and perhaps lucky enough to survive the Cretaceous-Palaeogene extinction 65.5 million years ago, when other lineages were wiped out. When the analysis was extended to include representatives of other tribes, it was concluded that molluscs are probably more closely related to bipeds than either group is to ctenophores, but this diagnosis is uncertain.

**Question 0**

Which genus of ctenophores do not have larvae that are kydiform?

**Question 1**

Molecular phylogeny analysis confirmed that cydippids are not what?

**Question 2**

When did the Cretaceous and Palaeogene extinction occur?

**Question 3**

Who did the morphological analysis in 1985 that concluded that cydippids are not monophyletic?

**Question 4**

What did Richard Harbison say in 2001 about beroids?

**Question 5**

What do beroids resemble more than other bipeds?

**Question 6**

In which period did Lobata, Cestida and Thalassocalycida become extinct?

**Question 7**

What was Harbison's analysis of Lobata in 2001?

**Question 8**

How many species of Cestida were discovered in 1985?

**Document number 454**

**Text number 0**

Fresno (/ˈfrɛznoʊ/ FREZ-noh), the capital of Fresno County, is a city in the U.S. state of California. In 2015, the city had a population of 520,159, making it the fifth largest city in California, the largest inland city in California, and the 34th largest city in the country. Fresno is located in the middle of the San Joaquin Valley and is the largest city in the Central Valley, which includes the San Joaquin Valley. It is located approximately 350 kilometres northwest of Los Angeles, 270 kilometres south of the state capital Sacramento and 300 kilometres south of San Francisco. Fresno's name means "ash tree" in Spanish, and the ash leaf is on the city's flag.

**Question 0**

Which city is the fifth largest in California?

**Question 1**

How far is Fresno from Los Angeles?

**Question 2**

What does the name Fresno mean in Spanish?

**Question 3**

What is on the flag of the city of Fresno?

**Question 4**

How to pronounce Fresno?

**Question 5**

What is the population of Los Angeles?

**Question 6**

What does Sacramento mean in Spanish?

**Question 7**

How big is the San Joaquin Valley?

**Question 8**

Which valley is Los Angeles in?

**Question 9**

What state capital is Fresno?

**Text number 1**

In 1872, the Central Pacific Railroad established a station near Easterby - now a highly productive wheat farm - for its new Southern Pacific line. Soon there was commerce around the station, and the commerce grew into the town of Fresno Station, later called Fresno. Many Millerton residents, attracted by the proximity of the railroad and concerned about flooding, moved to the new community. Fresno became an incorporated city in 1885. By 1931, the Fresno Traction Company operated 47 streetcars on 49 miles of track.

**Question 0**

The Central Pacific Railroad established a station on its new line in what year?

**Question 1**

What were the reasons residents moved to Fresno Station?

**Question 2**

In what year did Fresno become a registered town?

**Question 3**

How many streetcars did the Fresno Traction Company operate in 1931?

**Question 4**

What triggered the growth of Fresno's position?

**Question 5**

When was the Central Pacific Railroad founded?

**Question 6**

When did Millerton residents move out of Fresno?

**Question 7**

How long was the Southern Pacific line?

**Question 8**

When did Fresno Traction Company come to Fresno?

**Question 9**

Where did Fresno residents move to during the floods?

**Text number 2**

Before World War II, Fresno had many ethnic neighbourhoods, such as Little Armenia, German Town, Little Italy and Chinatown. In 1940, the Census Bureau reported that 94.0 percent of Fresno's population was white, 3.3 percent black, and 2.7 percent Asian. (Oddly enough, Chinatown was primarily a Japanese neighborhood, and Japanese-American businesses still exist). In 1942, Pinedale, in what is now North Fresno, was home to the Pinedale Assembly Center, a temporary facility for transferring Japanese Americans from the Fresno area to internment camps. The Fresno Fairgrounds was also used as an assembly center.

**Question 0**

What percentage of Fresno's population was Asian in 1940?

**Question 1**

In 1940, which ethnic district of Fresno had a predominantly Japanese population?

**Question 2**

What was the previous name of North Fresno in 1942?

**Question 3**

What was the Pinedale conference centre?

**Question 4**

What was the Fresno Exhibition Centre used for?

**Question 5**

What was the white population in Fresno in 1942?

**Question 6**

What percentage of Pinedale residents are black?

**Question 7**

What year was Chinatown founded?

**Question 8**

In which area of Fresno was the Fresno Exhibition Centre located?

**Question 9**

Which area was renamed Pinedale?

**Text number 3**

In September 1958, Bank of America launched a new product in Fresno called BankAmericard. After a difficult wait during which its creator resigned, the BankAmericard became the first successful credit card, i.e. a financial instrument that could be used with a variety of merchants and also allowed cardholders to pay their balances (earlier financial products could do one or the other, but not both). In 1976, BankAmericard was renamed and spun off as a separate company, now known as Visa Inc.

**Question 0**

Which new product was introduced by Bank of America in 1958?

**Question 1**

What was the name of the first successful credit card?

**Question 2**

What did BankAmericard allow customers to do that they could not do with previous financial instruments?

**Question 3**

In what year did BankAmericard change its name?

**Question 4**

What kind of company did BankAmericard become today?

**Question 5**

In which month did the creator of BankAmericard resign?

**Question 6**

What was the original name of BankAmericard?

**Question 7**

The BankAmericard could be used at many different merchants, but what couldn't it do?

**Question 8**

What year was BankAmericard successful?

**Question 9**

Where is Visa Inc. located?

**Text number 4**

In the 1970s, the city was the subject of the song "Walking Into Fresno", written by Hall Of Fame guitarist Bill Aken and recorded by Bob Gallion for the world-famous "WWVA Jamboree" radio and television program in Wheeling, West Virginia. Aken, who was adopted by Mexican film actress Lupe Mayorga, grew up in the neighboring town of Madera, and his song was about the hardships faced by migrant workers he saw as a child. Aken also made his first television appearance playing guitar on the old country-western show The Fresno Barn.

**Question 0**

Who wrote "Walking in Fresno"?

**Question 1**

Who recorded "Walking in Fresno"?

**Question 2**

In which town did Bill Aiken grow up?

**Question 3**

In which programme did Bill Aiken make his television debut?

**Question 4**

Who was Bill Aiken's adoptive mother?

**Question 5**

Which song did Bob Gallion write?

**Question 6**

What was Bill Aken's ethnic origin?

**Question 7**

Who owned the WWVA Jamboree?

**Question 8**

In which series did Lupe Mayorga star?

**Question 9**

Which singer was in the Hall of Fame?

**Text number 5**

Fresno has three major public parks, two in the city and one in the county in the southwest. Woodward Park, with its Shinzen Japanese Garden, numerous picnic areas and several miles of trails, is located in northern Fresno and borders the San Joaquin River Parkway. Near downtown Fresno, Roeding Park is home to the Fresno Chaffee Zoo and Rotary Storyland and Playland. Kearney Park is the largest park system in the Fresno area, home to the historic Kearney Mansion, and hosts the annual Civil War Revisited, the largest Civil War re-enactment on the West Coast of the United States.

**Question 0**

How many large public parks are there in Fresno?

**Question 1**

In which park is the Fresno Chafffee Zoo located?

**Question 2**

In which park is Kearney Manor located?

**Question 3**

What is one of the parks in North Fresno?

**Question 4**

Which park hosts the largest Civil War re-enactment on the West Coast?

**Question 5**

What kind of garden is Roeding Park?

**Question 6**

Which park is the smallest?

**Question 7**

What is the largest mansion on the West Coast?

**Question 8**

How long are the trails in Roeding Park?

**Question 9**

In which direction are the two parks in the city located?

**Text number 6**

Between the 1880s and World War II, downtown Fresno boomed, filled with electric streetcars and featuring some of the most beautiful architecture in the San Joaquin Valley. These included the original Fresno County Courthouse (demolished), the Fresno Carnegie Public Library (demolished), the Fresno Water Tower, the Bank of Italy Building, the Pacific Southwest Building, the San Joaquin Light & Power Building (now known as the Grand 1401) and the Hughes Hotel (burned).

**Question 0**

During which period did the centre of Fresno flourish?

**Question 1**

Which two of Fresno's most beautiful architectural buildings have now been demolished?

**Question 2**

Which former building is now known as Grand 1401?

**Question 3**

Which of the hotels in Fresno burned down?

**Question 4**

When was the Fresno County Courthouse demolished?

**Question 5**

What is the current name of the Pacific Southwest Building?

**Question 6**

What happened to the Bank of Italy building?

**Question 7**

What was the name of the Grand 1401 building renamed?

**Question 8**

What is the name of the hotel that was renamed Grand 1401?

**Text number 7**

Fulton Street in downtown Fresno was Fresno's main financial and commercial district before it was transformed into one of the country's first pedestrian malls in 1964. The area known as the Fulton Mall contains Fresno's densest collection of historic buildings. Although the Fulton Mall corridor has suffered a steep decline since its heyday, the mall contains some of the finest public art in the country, including the world's only Pierre-Auguste Renoir work that you can walk up to and touch. Current plans are to reopen the Fulton Mall to car traffic. Public artworks will be restored and placed close to their current locations, with wide sidewalks (up to 28 metres on the east side of the street) to maintain the pedestrian-friendly environment of the area.

**Question 0**

What year did Fresno get its first pedestrian mall?

**Question 1**

What was the new name of the pedestrian area?

**Question 2**

Which artist's work is located in Fulton Mall?

**Question 3**

Where will the works of art be located after restoration?

**Question 4**

What kind of feature will enrich the pedestrian-friendly environment after restoration?

**Question 5**

When did Fulton Street become the main financial district?

**Question 6**

How big is a work by Pierre-Auguste Renoir?

**Question 7**

What was the name of the Fulton Mall renamed?

**Question 8**

28' is the minimum size for what?

**Question 9**

Which side of the street are the works of art on?

**Text number 8**

Sunnyside is located on the southeast side of Fresno, bordering the west side of Chestnut Avenue. Its main thoroughfares are Kings Canyon Avenue and Clovis Avenue. Although part of Sunnyside is part of the City of Fresno, much of the neighborhood is a "county island" of Fresno County. The area was largely built from the 1950s to the 1970s, but there has been a recent boom in new housing construction. The area is also home to the Sunnyside Country Club, which operates a William P. Bell-designed golf course.

**Question 0**

Where is Sunnyside located in Fresno?

**Question 1**

What are the two main routes to Sunnyside?

**Question 2**

When was most of Sunniside developed?

**Question 3**

Where is Sunnyside Country Club located?

**Question 4**

Who designed the Sunnyside Country Club golf course?

**Question 5**

Who designed Sunnyside?

**Question 6**

In which decade was the Country Club built?

**Question 7**

Which street is on the west side of the golf course?

**Question 8**

Kings Canyon Avenue is southeast of which city?

**Question 9**

Chestnut Avenue runs through what?

**Text number 9**

The popular district known as the Tower District is centred around the historic Tower Theatre, which is on the National List of Historic Places. The theatre was built in 1939 and is located at the corner of Olive and Wishon Avenues in the heart of the Tower District (the name of the theatre refers to a well-known landmark, the Water Tower, which is actually located in another nearby area). The Tower District neighborhood is north of downtown Fresno proper and a half-mile south of Fresno City College. Although the district was known as a residential neighborhood in the past, the Tower District's early commercial establishments began as small shops and services that came to the area shortly after World War II. The character of local small businesses has largely survived to the present day. To some extent, Tower District businesses developed due to the proximity of the original Fresno Normal School (later renamed California State University at Fresno). In 1916, the college moved to the site of the current Fresno City College, located a half-mile north of the Tower District.

**Question 0**

Which historic theatre is surrounded by the Tower District?

**Question 1**

When was the tower theatre built?

**Question 2**

From which Fresno landmark is the Tower Theatre named?

**Question 3**

What was the original name of California State University in Fresno?

**Question 4**

How far is Fresno City College from the Tower District?

**Question 5**

When was the landmark water tower built?

**Question 6**

Fresno City College is located on which two streets?

**Question 7**

How many kilometres north of downtown Fresno is the Tower District?

**Question 8**

When was Fresno Normal School founded?

**Question 9**

What was the name of the renamed California State University?

**Text number 10**

This vibrant and culturally diverse retail and residential area underwent a period of renewal after a major recession in the late 1960s and 1970s. After decades of neglect and neighborhood blight, neighborhood revitalization followed the reopening of the Tower Theatre in the late 1970s, which at the time was showing second and third-run films as well as classic movies. Roger Rocka's Dinner Theater & Good Company Players also opened nearby in 1978 at the corner of Olive and Wishon Avenues[citation needed]. Audra McDonald, a Fresno native, starred in Evita and The Wiz when she was a high school student. McDonald went on to become a leading performer on New York's Broadway and a Tony Award-winning actress. The Tower District is also home to the Good Company Players' 2nd Space Theatre.

**Question 0**

What time was the Tower Theatre reopened?

**Question 1**

What kind of films did the Tower Theatre show after it reopened?

**Question 2**

What year did Roger Rocka's Dinner Theater & Good Company Players open?

**Question 3**

Where is Audra McDonald from?

**Question 4**

Which two main roles did Audra McDonald play as a high school student?

**Question 5**

When was the Tower Theatre closed?

**Question 6**

What did Roger Rocka's Dinner Theater & Good Company Players perform?

**Question 7**

What year did Audra McDonald play the roles in Evita and The Wiz?

**Question 8**

What kind of prize did Roger Rocka win?

**Question 9**

Who reopened the Tower Theatre?

**Text number 11**

The area has restaurants, live theatre and nightclubs, as well as several independent shops and bookshops currently operating on or near Olive Avenue, all within a few hundred metres of each other. Since the redevelopment, the Tower District has become an attractive area for restaurants and other local businesses. Today, the Tower District is also known as a hub for Fresno's LGBT and hipster communities; in addition, the Tower District is also known as a hub for Fresno's local punk/goth/death rock and heavy metal community[citation needed][citation needed].

**Question 0**

What kind of theatre is there in your neighbourhood?

**Question 1**

How far apart are some neighbourhood characteristics?

**Question 2**

What area has become attractive to restaurants?

**Question 3**

Which Fresno neighbourhood is the centre of the LGBT community?

**Question 4**

Which part of Fresno is known as the centre of the heavy metal community?

**Question 5**

How long is Olive Avenue?

**Question 6**

What kind of nightclubs are there in Fresno?

**Question 7**

What was the Tower District known for before the regeneration?

**Question 8**

Which communities avoid the Tower District?

**Text number 12**

The area is also known for its early 20th century homes, many of which have been restored in recent decades. There are many California bungalow and American Craftsman style houses, Spanish Colonial Revival architecture, Mediterranean Revival architecture, Mission Revival architecture and many story houses designed by Fresno architects, Hilliard, Taylor & Wheeler. The architecture of the Tower District residential areas contrasts with the newer low-rise residential areas to the north and east of Fresno.

**Question 0**

What kind of homes is Fresno known for?

**Question 1**

What kind of houses do Fresno architects design?

**Question 2**

Is the residential architecture of the Tower District comparable or contrasting with other Fresno neighbourhoods?

**Question 3**

How recently have Fresno homes been renovated?

**Question 4**

Who designed the Mission Revival-style architecture?

**Question 5**

Which area's architecture is the Tower District reminiscent of?

**Question 6**

When did Hilliard, Taylor and Wheeler work?

**Question 7**

Are California bungalows in the north or east?

**Question 8**

Who renovated the bungalows?

**Text number 13**

Early 20th-century houses line the boulevard in the heart of the historic Alta Vista Tract. The stretch of Huntington Boulevard between First Street on the west side and Cedar Avenue on the east side has many large, stately homes. Original development of the area began around 1910 on 190 acres of what had been alfalfa fields. The Alta Vista Tract was surveyed by William Stranahan for the Pacific Improvement Corporation and officially platted in 1911. The tract boundaries were Balch Avenue on the south, Cedar Avenue on the east, the rear property line of Platt Avenue (east of Sixth Street) and Platt Avenue (west of Sixth Street) on the north, and First Street on the west. The area was annexed into the city in January 1912 in an election that was the first in which women voted in the community. When the Alta Vista Tract was annexed into the city, it was uninhabited but landscaped, although trees had to be watered by tanker truck. In 1914, developers Billings & Meyering acquired the tract, completed the street construction, made the last necessary municipal improvements, including water, and began marketing the area with a frenzy. Just half a decade later, the area had 267 apartments. This rapid development was undoubtedly spurred by the Fresno Traction Company's ownership of a section of Huntington Boulevard that provided streetcar service between downtown and the county hospital.

**Question 0**

On which boulevard will you find many majestic homes in the area?

**Question 1**

Who surveyed the Alta Vista Tract?

**Question 2**

What year did Billings & Meyering acquire the Alta Vista Tract?

**Question 3**

How many homes were on the Alta Vista Tract five years after it was purchased by Billings & Meyering?

**Question 4**

Which company provided tram services between the city centre and the hospital?

**Question 5**

Who planted the alfalfa fields?

**Question 6**

To whom did the city grant the property in 1912?

**Question 7**

How many homes were built by Pacific Improvement Corporation?

**Question 8**

What was holding back the development of houses?

**Question 9**

When did the Fresno Traction Company start offering streetcar service?

**Text number 14**

Fresno's "West Side", often referred to as "Southwest Fresno", is one of the city's oldest neighbourhoods. Located on the southwest side of Highway 99 (which separates it from downtown Fresno), the west side of Highway 41, and the south side of Nielsen Avenue (or the newly constructed 180), the area straddles the city limits to the west and south. The neighborhood is traditionally considered the center of Fresno's African-American community. It is culturally diverse, with significant Mexican-American and Asian-American (primarily Hmong or Laotian) populations.

**Question 0**

What is another name for the west side of Fresno?

**Question 1**

In which direction is the west side of Fresno located in relation to Highway 99?

**Question 2**

What is the centre of the ethnic community west of Fresno?

**Question 3**

What are the two main Asian-American groups living in the west side of Fresno?

**Question 4**

Which district is located west of the 41 motorway?

**Question 5**

What is west of the West Side?

**Question 6**

What divides downtown Fresno?

**Question 7**

What is the ethnic community traditionally found in the centre?

**Question 8**

What are the specific groups in the Mexican-American population?

**Question 9**

What is remarkable about the age of downtown Fresno?

**Text number 15**

The area includes Kearney Boulevard, named after early 20th century entrepreneur and millionaire M. Theo Kearney, which stretches from Fresno Street in southwest Fresno about 20 miles west to Kerman, California. Kearney Boulevard is a small, two-lane rural road lined with tall palm trees. The approximately one-half mile stretch of Kearney Boulevard between Fresno Street and Thorne Avenue was once a favoured residential area for Fresno's elite African-American families. The other section, Brookhaven, on the southern edge of West Side south of Jensen and west of Elm, was named by the Fresno City Council in an effort to revitalize the neighborhood's image. The remote area was known for years as "Dogg Pound" by local gangs, and in late 2008 was still known for its high violent crime rate.

**Question 0**

Who is Kearney Boulevard named after?

**Question 1**

What kind of trees line Kearney Boulevard?

**Question 2**

Between which two streets on Kearney Boulevard did wealthy African-Americans once live?

**Question 3**

What was the name given to the section of Kearney Boulevard in an attempt to change the image of the area?

**Question 4**

Which area of Brookhaven is still known for its high crime rate?

**Question 5**

Who is Kerman, California named after?

**Question 6**

How long is Fresno Street?

**Question 7**

Who preferred Brookhaven's share?

**Question 8**

Who named Thorne Avenue?

**Question 9**

Which gang came to the West Side in 2008?

**Text number 16**

Although many of the houses in the neighbourhood date from the 1930s or before, there are also a number of public housing units in the area, built by the Fresno Housing Authority in the 1960s and 1990s. The US Department of Housing and Urban Development has also built small single-family homes in the area for low-income working families to purchase. There have been several attempts to revitalise the suburb, including the construction of a modern shopping centre at the corner of Fresno and B Streets, a failed attempt to build luxury apartments and a golf course on the western edge of the suburb, and some new Section 8 apartments built along Church Avenue on the west side of Elm St. Cargill Meat Solutions and Foster Farms both have large processing plants in the suburb, and the odour from these (and other small industrial plants) has long been a problem for residents. Fresno Chandler Executive Airport is also located on the West Side. Because of its location on the edge of town and years of neglect by developers, it is not a true "downtown" area, and the neighborhood is full of vacant lots, strawberry fields and vineyards. There is very little retail in the area except for the area near Fresno Street and the State Route 99 Freeway (Kearney Palm Shopping Center, built in the late 1990s) and small corner stores scattered throughout.

**Question 0**

When were public housing buildings built in the neighbourhood?

**Question 1**

On what corner is the shopping centre located?

**Question 2**

Which two processing plants are located nearby?

**Question 3**

Where is the airport located?

**Question 4**

How much retail is there in the neighbourhood?

**Question 5**

Which organisation built houses in the neighbourhood in the 1930s?

**Question 6**

On which corner were luxury apartments built?

**Question 7**

Which street was the golf course built on?

**Question 8**

What problem at Fresno Chandler Airport has been bothering residents?

**Question 9**

When was the State Route 99 Freeway built?

**Text number 17**

Woodward Park, in the north-east of Fresno, was founded by the late Ralph Woodward, a long-time resident of Fresno. He bequeathed much of his estate in 1968 to establish a regional park and bird sanctuary in northeast Fresno. The park is located on the south bank of the San Joaquin River between Highway 41 and Friant Road. With an original 235 acres (0.95 km2) and additional acres subsequently acquired by the City, the park now encompasses 300 acres (1.2 km2). Woodward Park is now full of amenities and is the only regional park of its size in the Central Valley. The southeast corner of the park is home to numerous bird species, providing birders with excellent viewing opportunities. The park features a multi-purpose amphitheater that can seat up to 2,500 people, an authentic Japanese garden, a fenced dog park, a three-mile equestrian trail, a fitness trail, three children's playgrounds, a lake, three small ponds, seven picnic areas and eight kilometers (5 miles) of multi-use trails that are part of the San Joaquin River Parkway's Lewis S. Eaton Trail. When complete, the Lewis S. Eaton Trail system will cover 35 miles between Highway 99 and Friant Dam. The park's numerous picnic tables make it a great picnic destination and a convenient escape from city life. The park's amphitheatre was renovated in 2010 and has hosted performances by the likes of Deftones, Tech N9ne and Sevendust. The park is open from April to October from 6am to 10pm and from November to March from 6am to 7pm. Woodward Park hosts the annual CIF (California Interscholastic Federation) State Cross Country Championships in late November. The park also hosts the Woodward Shakespeare Festival, which began performances at the park in 2005.

**Question 0**

Who founded Woodward Park?

**Question 1**

How many acres is Woodward Park in total?

**Question 2**

How many seats are there in the Woodward Park Amphitheatre?

**Question 3**

How many kilometres will the Lewis S. Eaton Trail be when completed?

**Question 4**

What months of the year is Woodward Park open?

**Question 5**

When did Ralph Woodward come to Fresno?

**Question 6**

How large was Woodward's total estate?

**Question 7**

What did Lewis S. Eaton donate?

**Question 8**

How many people visit the park every day?

**Question 9**

When is the amphitheatre open?

**Text number 18**

Founded in 1946, Sierra Sky Park Airport is a residential airport community created by a unique traffic law agreement that allows private planes and cars to share certain roads. Sierra Sky Park was the first built aviation community[citation needed], and today there are numerous such communities throughout the United States and the world. Developer William Smilie created the country's first planned aviation community. Still in operation today, the public-use airport provides a unique neighborhood that sparked interest and similar communities across the country.

**Question 0**

When was Sierra Sky Park Airport established?

**Question 1**

Who created the country's first aviation community?

**Question 2**

What is the name of the first aeronautical community built?

**Question 3**

With whom does the traffic law allow passenger aircraft to share roads?

**Question 4**

Are there other aviation communities like Sierra Sky Park in the US?

**Question 5**

When did Sierra Sky Park go out of service?

**Question 6**

Who created all the aviation communities in the country?

**Question 7**

What was prohibited by the Transport Act?

**Question 8**

What was the difference between planes and cars?

**Question 9**

What is the only one of its kind in the US?

**Text number 19**

Fresno is characterised by a semi-arid climate (Köppen BSh), with mild and humid winters and hot and dry summers, giving it a Mediterranean climate. December and January are the coldest months, with an average temperature of around 8,1 °C. There are 14 frosts each year, and the coldest night of the year is typically below -1.1°C. December and January are the coldest months, averaging around 8.1°C. December and January are the coldest months. July is the warmest month, averaging 83.0°F (28.3°C); there are usually 32 days when the temperature is above 100°F (37.8°C) and 106 days when the temperature is above 90°F (32.2°C), with only three or four days in July and August when the temperature does not rise above 90°F (32.2°C). During the summer, the sun shines a lot, with July seeing the highest sunlight levels at 97% of all possible hours. In January, sunlight is at its lowest, with only 46% of daylight hours in January due to thick fire and fog. However, during the year, sunshine averages 81% of the possible sunshine, or a total of 3,550 hours. The average annual rainfall is about 292.1 mm (11.5 inches), which by definition would classify the area as semi-arid. The majority of wind chill directions are from the northwest, as winds are directed downward along the axis of the California Central Valley; during Christmas, January, and February, wind chill statistics show more southeasterly wind directions. Fresno Meteorology was selected in a nationwide study by the U.S. Environmental Protection Agency for an equilibrium temperature analysis using ten years of meteorological data as representative of a warm and dry western U.S. locality.

**Question 0**

How could you describe the summers in Fresno?

**Question 1**

Which month is the warmest in Fresno?

**Question 2**

How much does it rain in Fresno on average per year?

**Question 3**

From which direction does most of the wind in Fresno come?

**Question 4**

During which month does the wind blow more from the south-east in Fresno?

**Question 5**

How many days in August are frosty?

**Question 6**

What percentage of light hours are in December?

**Question 7**

Which direction does the wind blow from in July?

**Question 8**

What is the average rainfall in July?

**Question 9**

On how many days in December does the temperature not reach 90 degrees?

**Text number 20**

The official high temperature record for Fresno is 46.1 °C (115 °F) on July 8, 1905, and the official low temperature record is -8 °C (17 °F) on January 6, 1913. The average temperatures averaged 37.8 °C (100 °F), 32.2 °C (90 °F), and frosts averaged from June 1 to September 13, April 26 to October 9, and December 10 to January 28, with no frosts in 1983/1984. Annual precipitation has ranged from 598.7 mm (23.57 inches) of rain from July 1982 to June 1983 to 112.5 mm (4.43 inches) from July 1933 to June 1934. The most rain in one month was 9.54 inches (242.3 mm) in November 1885 and the most rain in 24 hours was 3.55 inches (90.2 mm) on 18 November 1885. Measured rainfall averages 48 days per year. Snow is rare; the heaviest snowfall at the airport was 2.2 inches (0.06 m) on 21 January 1962.

**Question 0**

What is the hottest temperature record in Fresno?

**Question 1**

On what day did Fresno have record low temperatures?

**Question 2**

What year did it rain the most in Fresno?

**Question 3**

How much snow has it ever snowed the most in Fresno?

**Question 4**

What is the highest 24-hour rainfall recorded in Fresno?

**Question 5**

What is the record low for July?

**Question 6**

What is the record high for January?

**Question 7**

What was the highest rainfall recorded in June?

**Question 8**

How much snow fell in 1885?

**Question 9**

How much did it rain in 1962?

**Text number 21**

According to the 2010 US Census, Fresno had a population of 494,665. The population density was 4 404.5 people per square mile (1 700.6/km²). The racial makeup of Fresno was 245,306 (49.6%) white, 40,960 (8.3%) African American, 8,525 (1.7%) Native American, 62,528 (12.6%) Asian (3.6% Hmong, 1.7% Native American, 1,2 % Filipino, 1.2 % Laotian, 1.7 % Native American, 1.7 % Filipino, 1.2 % Laotian, 1.7 % African American, 1.7 % African American, 1.7 % African American and 1.7 % Laotian. 0% Thai, 0.8% Cambodian, 0.7% Chinese, 0.5% Japanese, 0.4% Vietnamese, 0.2% Korean), 849 (0.2%) Pacific Islanders, 111,984 (22.6%) from other races and 24,513 (5.0%) from two or more races. There were 232,055 (46.9%) Hispanics or Latinos. 42.7% of the Hispanic population is Mexican, 0.4% Salvadoran and 0.4% Puerto Rican. Whites accounted for 30.0% of the population in 2010, down from 72.6% in 1970.

**Question 0**

What was the population of Fresno in 2010?

**Question 1**

What was the percentage of whites in Fresno in 2010?

**Question 2**

How many Indians lived in Fresno in 2010?

**Question 3**

What was the percentage of non-Hispanic whites in 2010?

**Question 4**

How many people per square kilometre lived in Fresno in 2010?

**Question 5**

What was the population of the United States in 2010?

**Question 6**

How many Native Americans were there in 1970?

**Question 7**

What percentage of the population of Fresno was Filipino in 1970?

**Question 8**

Which breed group has increased since 1970?

**Question 9**

What was the population density in 1970?

**Text number 22**

There were 158,349 households, of which 68,511 (43.3%) had children under the age of 18, 69,284 (43.8%) had married couples of the opposite sex living together, 30,547 (19.3%) had a female housekeeper without a husband and 11,698 (7.4%) had a male housekeeper without a wife. There were 12 843 (8.1%) unmarried partnerships of the opposite sex and 1 388 (0.9%) same-sex married couples or partnerships. 35 064 households (22.1%) were made up of individuals, and 12 344 (7.8%) had a person aged 65 or over living alone. The average household size was 3.07. There were 111 529 families (70.4% of all households) with an average family size of 3.62.

**Question 0**

How many households have children under 18 living in them?

**Question 1**

What proportion of female housekeepers had no husband present?

**Question 2**

How many same-sex married couples or partnerships were there?

**Question 3**

What was the average family size?

**Question 4**

What was the average household size?

**Question 5**

What percentage of households had children over 18 years old?

**Question 6**

What was the average family size without the wife?

**Question 7**

How many unmarried opposite-sex couples had children?

**Question 8**

How many same-sex partnerships without children were there?

**Question 9**

How many households had a person aged under 18 living alone?

**Text number 23**

At the 2000 census, the city was home to 427 652 people, 140 079 households and 97 915 families. The population density was 4 097.9 people per square mile (1 582.2/km²), with 149 025 dwellings and an average population density of 1 427.9 square miles (3 698 km2). The racial composition of the city was 50.2% white, 8.4% black or African American, 1.6% Native American, 11.2% Asian (of which about one-third are Hmong), 0.1% Pacific Islander, 23.4% other races, and 5.2% bi-racial or multi-racial. Hispanics or Latinos made up 39.9% of the population.

**Question 0**

How many people lived in Fresno in 2000 according to the Census Bureau?

**Question 1**

How many dwellings were there in 2000?

**Question 2**

What was the percentage of black or African-Americans living in the city?

**Question 3**

What proportion of the Asian population were Hmong?

**Question 4**

What was the population density in 2000?

**Question 5**

What is the ethnic origin of a third of Pacific Islanders?

**Question 6**

How many families per square kilometre are there in Fresno?

**Question 7**

What percentage of whites are Hispanic or Latino?

**Question 8**

What percentage of the population are Hmong?

**Question 9**

What proportion of Hmong are Asian?

**Text number 24**

To avoid interference with existing VHF TV stations in the San Francisco Bay Area and those planned for Chico, Sacramento, Salinas and Stockton, the Federal Communications Commission decided that only UHF TV stations would be located in Fresno. The first Fresno television station to begin broadcasting was KMJ-TV, which began operation on June 1, 1953. KMJ is now known as KSEE, a subsidiary of NBC. Other Fresno stations include ABC O&O KFSN, CBS subsidiary KGPE, CW subsidiary KFRE, FOX subsidiary KMPH, MNTV subsidiary KAIL, PBS subsidiary KVPT, Telemundo O&O KNSO, Univision O&O KFTV and MundoFox and Azteca subsidiary KGMC-DT.

**Question 0**

Why are there only UHF TV stations in Fresno?

**Question 1**

What was the first television station to broadcast in Fresno?

**Question 2**

When did KMJ-TV broadcast its first programme?

**Question 3**

What is the KMJ referred to now?

**Question 4**

What is the name of Fresno's CBS subsidiary?

**Question 5**

What kind of stations are there in Chico?

**Question 6**

What was the name of the first Sacramento station?

**Question 7**

When did the FCC decide that only UHF stations could exist in Fresno?

**Question 8**

What was the original name of KMJ?

**Question 9**

What is the FOX affiliate in Salinas?

**Text number 25**

Fresno is served by State Route 99, the main north-south highway connecting the major population centres of California's Central Valley. State Route 168, the Sierra Freeway, leads east to the city of Clovis and Huntington Lake. State Route 41 (Yosemite Freeway/Eisenhower Freeway) enters Fresno from Atascadero in the south and then runs north to Yosemite. State Route 180 (Kings Canyon Freeway) enters from the west via Mendota and east from Kings Canyon National Park towards the town of Reedley.

**Question 0**

Which route connects Fresno and the Central Valley of California?

**Question 1**

What is another name for Highway 168?

**Question 2**

What is another name for the Yosemite Freeway?

**Question 3**

From which direction does State Highway 180 come through Mendota?

**Question 4**

What is another name for Highway 99?

**Question 5**

Highway 168 is called the Sierra Freeway and what other two names?

**Question 6**

What's on the west side of State Route 41?

**Question 7**

What is the name of the park in Atascadero?

**Question 8**

Which state road 168 on the west side?

**Text number 26**

Fresno is the largest US city not directly on a highway. When the Interstate Highway System was created in the 1950s, it was decided to build the current Interstate 5 on the west side of the Central Valley, bypassing many of the settlements in the area rather than improving the existing State Route 99. Because of the rapid growth in population and traffic in the towns along SR 99 and the desirability of federal funding, there has been much discussion of upgrading it to interstate standards and eventually incorporating it into the interstate highway system, most likely as Interstate 9. Significant improvements in signage, lane width, median separation, vertical clearance and other aspects are underway.

**Question 0**

What is the largest city not connected to a motorway?

**Question 1**

What year was the Interstate Highway System created?

**Question 2**

What state-by-state improvements to interstate standards have been discussed?

**Question 3**

What factors have contributed to the desire to improve SR 99 interstate?

**Question 4**

What is the largest city directly on the motorway?

**Question 5**

When was Highway 99 built?

**Question 6**

What increased rapidly in State 5?

**Question 7**

What do many people want to include on Highway 5?

**Question 8**

Which side of SR 99 is built on?

**Text number 27**

Amtrak San Joaquins provides passenger rail services. The main train station is the recently renovated historic Santa Fe Railroad Depot in downtown Fresno. The Burlington Northern Santa Fe Railway and Union Pacific Railroad's Bakersfield-Stockton main lines intersect in Fresno, and both railroads have yards in the city; the San Joaquin Valley Railroad also operates former Southern Pacific branch lines running west and south of the city. The City of Fresno is planned to serve the future California High Speed Rail line.

**Question 0**

Which company provides train services in Fresno?

**Question 1**

Where is the Santa Fe Railroad Depot located?

**Question 2**

Which two railway companies have yards in the city of Fresno?

**Question 3**

If you wanted to take a train west or south from Fresno, which train would you take?

**Question 4**

Which city is to be part of the California High Speed Rail?

**Question 5**

Who restored the Santa Fe Railroad Depot?

**Question 6**

What does the San Joaquin Valley Railway cross?

**Question 7**

Who owns the California high-speed train?

**Question 8**

Which main lines run west and south of the city?

**Question 9**

Who took over the San Joaquin Valley Railroad branch lines?

**Document number 455**

**Text number 0**

In the late 1950s, American computer scientist Paul Baran developed the concept of Distributed Adaptive Message Block Switching to provide a fault-tolerant and efficient routing method for telecommunications messages as part of a US Department of Defense-funded research programme at the RAND Corporation. This concept was contrary to and in conflict with the previously established principles of preallocation of network bandwidth, which had been largely reinforced by the development of telecommunications in the Bell system. The new concept had little resonance with network implementers until Donald Davies went freelance at the UK's National Physical Laboratory (NPL) in the late 1960s. Davies is credited with coining the modern term packet switching and inspiring numerous packet switching networks in Europe over the next decade, including its inclusion in the early ARPANET network in the United States.

**Question 0**

What Paul Baran developed

**Question 1**

What Distributed Adaptive Message Block Switching did

**Question 2**

What this concept was in conflict with

**Question 3**

What Donald Davies has done

**Question 4**

What Paul Baran developed in the late 1950s -

**Question 5**

What was the aim of the scheme

**Question 6**

Who gave this system its modern name?

**Question 7**

Which concept was developed in the late 1950s?

**Question 8**

What did the concept hope to achieve?

**Question 9**

How much funding did the RAND Corporation receive?

**Question 10**

What was Donald Davis' independent work?

**Question 11**

What was the Bell System?

**Question 12**

What did the US Department of Defense get for its funding to the RAND Corporation?

**Question 13**

Who gave Paul Baran credit for his development?

**Question 14**

Who created the Bell system?

**Question 15**

The aim of Packet Switching was to create what?

**Question 16**

Who created ARPANET?

**Question 17**

Did Paul Baran develop Distributed Adaptive Message Block Switching with the aim of making money from it?

**Question 18**

Did Paul Baran get help from anyone when he developed the concept?

**Question 19**

Was the development of this concept initially considered "classified" or secret?

**Question 20**

Was this concept originally intended for military use only?

**Question 21**

Why was this concept generally unpopular before Donald Davies finished his work?

**Question 22**

What did Donald Davies develop in the late 1950s?

**Question 23**

What did the RAND Corporation do?

**Question 24**

Which organisation did Paul Baran work with in the UK?

**Question 25**

Who created ARPANET in the United States?

**Question 26**

What reinforced this concept?

**Text number 1**

Packet switching differs from the other main network paradigm, circuit switching, which is a method of pre-allocating network bandwidth to each communication session, with a constant bit rate and delay between nodes. In billable services such as mobile services, circuit switching is characterised by a charge per unit of connection time even if no data is transferred, while packet switching may be characterised by a charge per unit of information transferred, such as characters, packets or messages.

**Question 0**

Packet switching as opposed to what other main

**Question 1**

What is specific to circuit switching

**Question 2**

How packet switching is characterised

**Question 3**

What is the difference between packet switching and

**Question 4**

How the circuit switching is distributed

**Question 5**

How the circuit connection is characterised

**Question 6**

How packet switching is characterized

**Question 7**

What is circuit switching?

**Question 8**

How much bandwidth is reserved for each communication session?

**Question 9**

How is data charged for packet switching?

**Question 10**

How is data charged differently for circuit switching?

**Question 11**

What is the delay between nodes?

**Question 12**

What is packet switching?

**Question 13**

What is the bit rate for packet switching communications?

**Question 14**

How is packet switching distributed?

**Question 15**

What determines the packet forwarding rate?

**Question 16**

What type of network is used for packet switching?

**Question 17**

Do the packages vary in size?

**Question 18**

If parcel sizes vary, are they always charged at the same price per parcel?

**Question 19**

What is the minimum package size, if any?

**Question 20**

Can the package be sent empty? If so, is it billable?

**Question 21**

What kind of information is charged for?

**Question 22**

Is there a charge for packet switching when data is not transferred?

**Question 23**

What does packet switching share in advance?

**Question 24**

What is special about the packet switching communication sessions?

**Text number 2**

Communication in packet mode can be implemented with or without intermediary nodes (packet switches or routers). Intermediate network nodes typically forward packets asynchronously using buffering first-in, first-out, but they may be forwarded according to some scheduling scheme for fair queuing, traffic shaping, or differentiated or guaranteed quality of service, such as weighted fair queuing or leaky buckets. In the case of a shared physical medium (such as radio or 10BASE5), packets may be delivered under a multiple access scheme.

**Question 0**

If it is a shared physical medium, how will they be delivered?

**Question 1**

How to communicate in packet mode

**Question 2**

How packages are usually forwarded

**Question 3**

In the case of a shared instrument, how is it delivered?

**Question 4**

What kind of communication can be done?

**Question 5**

Which route can be used to deliver the parcels?

**Question 6**

What type of equipment is a 10BASE5 radio?

**Question 7**

What are intermediate nodes?

**Question 8**

How are parcels delivered differently?

**Question 9**

How are parcels delivered when there is no shared medium?

**Question 10**

How are parcels delivered if the physical medium is not shared?

**Question 11**

How are parcels forwarded irregularly?

**Question 12**

When is packet mode data transfer not implemented?

**Question 13**

How is packet mode data transmission decrypted?

**Question 14**

How many access points are there in a "multi-locking system"?

**Question 15**

Do certain packages have priority over others if they are sent at exactly the same time?

**Question 16**

Can a package go missing, and if so, where does it go?

**Question 17**

What exactly does "leaky bucket" mean in this context?

**Question 18**

Does a data packet have physical mass?

**Question 19**

If there is no common physical medium, how will the packages be delivered?

**Question 20**

How are packets forwarded synchronously?

**Question 21**

If there is no radio or 10BASE5 network, how will the packages be delivered?

**Question 22**

What is the only way to forward parcels?

**Question 23**

What is not a guaranteed quality of service?

**Text number 3**

Baran developed the concept of distributed adaptive message block switching while researching survivable communication networks for the US Air Force at the RAND Corporation, first presented to the Air Force in the summer of 1961 as briefing B-265, later published as RAND Report P-2626 in 1962, and finally in Report RM 3420 in 1964. Report P-2626 described the general design of a large-scale, distributed and viable communications network. The work focused on three key ideas: a distributed network with multiple paths between any two points, the division of user messages into message blocks, later called packets, and the delivery of these messages by storing and forwarding them.

**Question 0**

What Baran developed during his research at RAND

**Question 1**

What was developed for the air force

**Question 2**

Which 3 things are the most important tasks of the Air Force?

**Question 3**

How Air Force messages are delivered

**Question 4**

Which concept was developed by Baran during his research at RAND.

**Question 5**

What was report P-2626

**Question 6**

What the network focused on

**Question 7**

What delivery message was used

**Question 8**

What was developed in the summer of 1961?

**Question 9**

What were the ideas put forward in the 1964 report?

**Question 10**

How many priorities were there in report P-2626?

**Question 11**

Who owned RAND?

**Question 12**

How was the move forward implemented?

**Question 13**

Who introduced the B-265 to the US Air Force?

**Question 14**

What did RM 3420 report?

**Question 15**

What was the US Air Force interested in?

**Question 16**

How were the messages delivered before implementation?

**Question 17**

What was the Air Force not interested in in its messaging system?

**Question 18**

Did Baran develop this "only" for the air force?

**Question 19**

Did RAND retain any of the research results?

**Question 20**

If this was developed for the Air Force, does the Air Force technically still own the intellectual property?

**Question 21**

Assuming that the Air Force paid for the concept development, would the Air Force be entitled to a royalty for each package sent?

**Question 22**

Was RAND prohibited from disclosing research to anyone other than the Air Force?

**Question 23**

What was developed for RAND Corporation?

**Question 24**

How does the company communicate these messages?

**Question 25**

What was report R-2626?

**Question 26**

What concept did Baran explore for the US Air Force?

**Question 27**

How did RAND use this network?

**Text number 4**

From 1965, Donald Davies worked independently at the National Physical Laboratory in the UK, developing the same message routing method as Baran had developed. He called it packet switching, a more accessible name than Baran's, and proposed building a nationwide network in the UK. He gave a presentation on the proposal in 1966, after which a person from the Ministry of Defence (MoD) told him about Baran's work. A member of Davies' group (Roger Scantlebury) met Lawrence Roberts in 1967 at an ACM symposium on the principles of operating systems and suggested it for use in ARPANET.

**Question 0**

What Donald Davies developed

**Question 1**

Why Davies called his scheme

**Question 2**

What Davies wanted to build

**Question 3**

What use was proposed for the system

**Question 4**

which developed the same technology as Baran

**Question 5**

Why Davies called the scheme

**Question 6**

What was proposed at the symposium in 1967?

**Question 7**

How independently was a separate system created in 1965?

**Question 8**

Where was the ACM Symposium held?

**Question 9**

What does ARPANET mean in simple terms?

**Question 10**

What did the Ministry of Defence discuss in 1966?

**Question 11**

Has "independently developed" ever been proven?

**Question 12**

Did Davies and Baran collaborate at any point after they both developed this concept?

**Question 13**

Why did Davies never research his theory, concept, idea, etc. before developing it?

**Question 14**

Did Davies develop his concept with the intention of making money from it?

**Question 15**

Why not a global network and not just a UK network?

**Question 16**

What did Baran call his system?

**Question 17**

What did Lawrence Roberts propose the system for?

**Question 18**

What did Baran want to build with the system?

**Question 19**

Who did Davies tell about Baran's work?

**Question 20**

What did Baran call his message routing method?

**Text number 5**

In unconnected mode, each packet contains full address information. Packets are routed one by one, sometimes resulting in different routing paths and disorderly delivery. Each packet is tagged with the destination address, source address and port numbers. The packet may also have a packet sequence number. This way, the packet does not need a separate path to help it find its destination, but the packet header requires much more information, so it is larger, and this information must be searched for in the power-hungry content memory. Each packet is sent and may take different paths; possibly the system has to do as much work for each packet as a connection-oriented system has to do to establish a connection, but has less information about the application's requirements. At the destination, the original message/data is reassembled into the correct order based on the sequence number of the packet. Thus, a virtual connection, also known as a virtual circuit or byte stream, is provided to the end user using a transport layer protocol, even though intermediate nodes in the network only provide network layer service without connection.

**Question 0**

What does each package contain in unconnected mode?

**Question 1**

How packets are routed

**Question 2**

What each label contains

**Question 3**

What happens to the parcel at destination

**Question 4**

What leads to out-of-order delivery?

**Question 5**

Even if the packages are correctly labelled, what can happen to them?

**Question 6**

Why do parcels arrive out of order?

**Question 7**

Where will the data be recompiled?

**Question 8**

What is a virtual connection?

**Question 9**

Can I send an incomplete package?

**Question 10**

If three consecutive packets are sent and the middle packet is lost, how can the data be reassembled in a meaningful way?

**Question 11**

Can a parcel ever be sent to the wrong number?

**Question 12**

If the parcels take different routes, how do they arrive in order?

**Question 13**

What is each message marked with?

**Question 14**

How are messages routed?

**Question 15**

Why do we need a dedicated path?

**Question 16**

What does the data contain in the disconnected state?

**Text number 6**

Connection-oriented transmission requires that each participating node has an initiation phase to define the communication parameters before packets are transmitted. Packets contain a contact identifier instead of address information, and are negotiated between end nodes to ensure that they are delivered in an orderly and error-checked manner. The address information is transferred to each node only during the connection establishment phase, when the route to the destination is discovered and an entry is added to the switch table at each node in the network through which the connection passes. The signalling protocols used allow the application to define its requirements and find the link parameters. The acceptable values of the service parameters can be negotiated. Routing a packet requires the node to look up the connection ID in the table. The packet header can be small, as it only needs to contain this identifier and possible information such as length, timestamp or sequence number, which are different for different packets.

**Question 0**

What it takes to establish a connection

**Question 1**

What is the connection identifier

**Question 2**

Why does a node need to retrieve data from

**Question 3**

Is the title of the package long

**Question 4**

What is the start-up phase?

**Question 5**

What does error checking have to do with editing?

**Question 6**

Which system requires a routing package?

**Question 7**

What does the node read?

**Question 8**

What values are negotiable?

**Question 9**

Can packages ever collide on the route?

**Question 10**

Are the link parameters based on size?

**Question 11**

Can a node ever get the wrong contact number?

**Question 12**

Can the address information be changed after the incorporation phase?

**Question 13**

Is there a situation where a destination cannot be found?

**Question 14**

When is address information not transferred to each node?

**Question 15**

What is required for a connectionless transfer?

**Question 16**

What does the title of a large package contain?

**Question 17**

What addresses are being negotiated?

**Text number 7**

Both X.25 and Frame Relay offer connection-oriented functions. However, X.25 does so at the network layer of the OSI model. Frame Relay does it at layer two, the data link layer. Another major difference between X.25 and Frame Relay is that X.25 requires a handshake between the communicating parties before sending user packets. Frame Relay does not specify such handshakes. X.25 does not specify any functions within the packet network. It operates only at the user network interface (UNI). Thus, the network provider is free to use any procedure it wishes within the network. X.25 defines some limited retransmission procedures in the UNI, and its link layer protocol (LAPB) provides standard HDLC-type link management procedures. Frame Relay is a modified version of the ISDN second layer protocol, LAPD and LAPB. As such, its integrity features apply only to the operations between nodes in the link, not to end-to-end operations. All retransmissions must be performed using upper layer protocols. The X.25 UNI protocol is part of the X.25 protocol suite, which consists of the three lower layers of the OSI model. It was widely used in UNI packet switching networks in the 1980s and early 1990s to provide a standardised interface to and from packet networks. In some implementations, X.25 was also used within the network, but its connection-oriented characteristics made this configuration cumbersome and inefficient. Frame relay works mainly at the second layer of the OSI model. However, its address field (Data Link Connection ID or DLCI) can be used at the OSI network layer if a minimum number of procedures are used. This frees it from many of the burdens of the third layer of X.25, but the DLCI is still used as an identifier in addition to the second layer link protocol between nodes. The simplicity of Frame Relay makes it faster and more efficient than X.25. Because Frame Relay is a data link layer protocol, it, like X.25, does not specify intra-network routing operations. X.25's packet identifiers - virtual circuit and virtual channel numbers - must be mapped to network addresses. The same is true in Frame Relay for DLCI. How this is done depends on the network provider. Since Frame Relay has no network layer procedures, it is connection-oriented at the second layer level using the HDLC/LAPD/LAPB Set Asynchronous Balanced Mode (SABM) method. X.25 connections are usually established for each data transfer session, but have a feature that allows a limited amount of traffic to be transferred over UNI without connection-oriented handshaking. Frame Relay was used for some time to connect LANs in broadband networks. However, X.25 and Frame Relay have been superseded by Internet Protocol (IP) at the network layer and Asynchronous Transfer Mode (ATM) and Multi-Protocol Label Switching (MPLS) versions at layer two. A typical configuration is to use IP over ATM or MPLS. <Uyless Black, X.25 and Related Protocols, IEEE Computer Society, 1991> <Uyless Black, Frame Relay Networks, McGraw-Hill, 1998> <Uyless Black, MPLS and Label Switching Networks, Prentice Hall, 2001> <Uyless Black, ATM, Volume I, Prentice Hall, 1995>.

**Question 0**

What do the x.25 and Frame Relay standards require?

**Question 1**

What were X.25 and Frame relay used for?

**Question 2**

What replaced Frame Relay and X.25?

**Question 3**

What is a typical configuration

**Question 4**

What does Frame Relay offer?

**Question 5**

What is the second level of connectionism?

**Question 6**

What is a "handshake" between the parties involved in communication?

**Question 7**

What is a protocol package?

**Question 8**

Where was packet switching used in the 1980s?

**Question 9**

Frame Relay requires a handshake from where?

**Question 10**

What does Frame Relay's LAPB offer?

**Question 11**

What are the integrity functions of X.25 for?

**Question 12**

When did UNI start using Frame Relay protocols?

**Question 13**

How are X.25 connections routed on the second floor?

**Text number 8**

ARPANET and SITA HLN were introduced in 1969. Before the introduction of X.25 in 1973, about twenty different network technologies had been developed. Two fundamental differences related to the distribution of functions and tasks between hosts at the edge of the network and the core of the network. In a datagram system, hosts are responsible for the correct delivery of packets. User Datagram Protocol (UDP) is an example of a datagram protocol. In a virtual telephony system, the network guarantees sequential delivery of data to the host. This results in a simpler host interface with fewer functions than the datagram model. The X.25 protocol package uses this type of network.

**Question 0**

When were ARPNET and SITA introduced?

**Question 1**

2 differences between X.25 and ARPNET CITA technologies

**Question 2**

What does the UserDatagram Protocol guarantee?

**Question 3**

X.25 uses which network type

**Question 4**

How many different types of network technology existed before 1973?

**Question 5**

What kind of network does SITA HLN not use?

**Question 6**

X.25 was simpler than what?

**Question 7**

X.25 had fewer functions because of what?

**Question 8**

What are the differences between ARPANET and SITA HLN and X.25?

**Question 9**

How many network technologies had been developed since the introduction of X.25 in 1973?

**Question 10**

What does the network guarantee in UDP?

**Question 11**

Which packet uses UDP?

**Question 12**

What is the responsibility of hosts in a virtual call system?

**Text number 9**

AppleTalk was a proprietary set of network protocols developed by Apple Inc. in 1985 for Apple Macintosh computers. It was the primary protocol used by Apple devices in the 1980s and 90s. AppleTalk included features that allowed ad hoc local area networks to be set up without a central router or server. AppleTalk automatically assigned addresses, updated the distributed namespace and configured the necessary network-to-network routing. It was a plug-n-play system.

**Question 0**

What was Apple Talk

**Question 1**

What were the features of Apple Talk

**Question 2**

What Apple's system automatically showed

**Question 3**

This type of system is known as

**Question 4**

What did Apple Inc create in 1985?

**Question 5**

What was the purpose of the series developed in 1985?

**Question 6**

Why was Appletalk considered a plug-n-play version?

**Question 7**

What created the central router or server?

**Question 8**

Would only Apple devices be able to use this suite?

**Question 9**

AppleTalk was developed in 1995 for whom?

**Question 10**

How was Appletalk used to create non-neighbourhood networks?

**Question 11**

What was the system for routing between networks?

**Question 12**

Which protocol was popular in the 1970s and 80s at Apple?

**Text number 10**

The CYCLADES packet switching network was a French research network designed and managed by Louis Pouzin. First presented in 1973, it was developed to explore alternatives to the early ARPANET structure and to support network research in general. It was the first network where the reliable delivery of data was the responsibility of the hosts rather than the network itself, using unreliable datagrams and associated end-to-end protocol mechanisms. The concepts of this network influenced the later ARPANET architecture.

**Question 0**

Which network was designed by the French

**Question 1**

What was the first time for this network

**Question 2**

How this was possible

**Question 3**

This network influenced later models

**Question 4**

Which alternative to ARPANET was developed?

**Question 5**

Did ARPANET develop the first system to make hosts responsible for providing data?

**Question 6**

What concepts influenced the later ARPANET?

**Question 7**

Who had influenced ARPANET?

**Question 8**

What options did CYCLADES offer?

**Question 9**

Who developed the Finnish research network, the CYCLADES package?

**Question 10**

Why was it developed in 1983?

**Question 11**

It was not the first network that made the hosts responsible for what?

**Question 12**

How did the network deliver the data?

**Text number 11**

DECnet is a set of network protocols created by Digital Equipment Corporation, originally released in 1975 to connect two PDP-11 minicomputers. It evolved into one of the first peer-to-peer network architectures, making DEC a network powerhouse in the 1980s. Originally a three-layer network, it later (1982) evolved into a seven-layer OSI-compliant network protocol. The DECnet protocols were entirely designed by Digital Equipment Corporation, but DECnet Phase II (and later phases) were open standards whose specifications were published, and several implementations were developed outside DEC, including one for Linux.

**Question 0**

What is DECnet

**Question 1**

What DECnet originally did

**Question 2**

The DEC originally had 3 layers, but it evolved into how many layers?

**Question 3**

What became of DECnet Phase 2

**Question 4**

DECnet means what?

**Question 5**

What is a peer-to-peer network?

**Question 6**

What kind of protocols have been developed?

**Question 7**

What does the DECnet suite include?

**Question 8**

Who took advantage of the late releases?

**Question 9**

DECnet was originally published in 1982 for what reason?

**Question 10**

How many floors did the DEC originally have when it was built with four floors?

**Question 11**

Why did Linux become the powerhouse of networks in the 1980s?

**Question 12**

Who designed the DECnet II protocols?

**Question 13**

What became of DECnet Phase I?

**Text number 12**

In 1965, at the initiative of Warner Sinback, a data network based on this voice telephone network was designed to connect GE's four computer sales and service centers (Schenectady, Phoenix, Chicago and Phoenix) and facilitate computer time-sharing services, apparently the world's first commercial network service. (In addition to selling GE computers, the centers were also computer service bureaus that provided batch processing services. The centres were making a loss from the start, and Sinback, a high-level marketing executive, was tasked with turning the business around. He decided that a time-sharing system based on Kemeny's work at Dartmouth, using a computer on loan from GE, could be profitable. Warner was right.)

**Question 0**

What was Warner Sinback

**Question 1**

The four sales and service centres are considered to be

**Question 2**

Were the centres profitable

**Question 3**

What Warner Sinback decided

**Question 4**

Who lost money?

**Question 5**

What kind of work was done at Dartmouth?

**Question 6**

What was the world's first commercial online service?

**Question 7**

What did Warner Sinback offer?

**Question 8**

What was Warner right about?

**Question 9**

What are these five computer sales and service centres?

**Question 10**

Which university did Sinback work with on the time-sharing system?

**Question 11**

What was Kemney's job at GE?

**Text number 13**

Merit Network, Inc. is an independent non-profit 501(c)(3) corporation operated by Michigan Public Universities, founded in 1966 as the Michigan Educational Research Information Triad to explore computer networking among three Michigan public universities as a means to promote education and economic development in the state. With initial support from the State of Michigan and the National Science Foundation (NSF), the packet-switched network was first demonstrated in December 1971, when an interactive host computer link was established between the IBM mainframe systems of the University of Michigan in Ann Arbor and Wayne State University in Detroit. In October 1972, connections to the CDC mainframe at Michigan State University in East Lansing completed the trio. Over the next few years, the network was extended beyond interactive host-to-host connections to support terminal-to-terminal connections, host-to-host batch connections (remote job submission, remote printing, file transfer), interactive file transfer, gateways to the public Tymnet and Telenet networks, host-to-host X.25interfaces, gateways to X.25 networks, Ethernet-connected hosts, and eventually TCP/IP, and Michigan's public universities joined the networks. All this paved the way for Merit's role in the NSFNET project from the mid-1980s onwards.

**Question 0**

Why was the Merit network established in Michigan?

**Question 1**

What completed the trio

**Question 2**

What set the stage for Merits' role in NSFNET?

**Question 3**

What helped the state's educational and economic development?

**Question 4**

Where was the packet-switched network first introduced?

**Question 5**

What was the triad?

**Question 6**

What was Merits' possible role?

**Question 7**

How many people joined the "network"?

**Question 8**

After Ann Arbor University and Wayne State University, who was the third university to complete the trio?

**Question 9**

When did Michigan's public universities form Michigan Network Inc?

**Question 10**

Why was the Michigan Education Research Data Cluster established?

**Question 11**

What did Michigan Inc. start in the mid-1980s?

**Question 12**

NSF helped the network to improve what?

**Text number 14**

Telenet was the first public information network licensed by the FCC in the United States. It was founded by former ARPA IPTO Director Larry Roberts as a way to make ARPANET technology public. He had tried to get AT&T interested in buying the technology, but the monopoly reacted that this was not compatible with its future. Bolt, Beranack and Newman (BBN) provided the funding. It initially used ARPANET technology, but changed the host interface to X.25 and the terminal interface to X.29. Telenet designed these protocols and helped standardise them at CCITT. Telenet was founded in 1973 and became operational in 1975. It was listed on the stock exchange in 1979 and then sold to GTE.

**Question 0**

What was telenet

**Question 1**

Who created Telnet

**Question 2**

The purpose of Telnet

**Question 3**

Telnet Used what connection technology

**Question 4**

Telnet was sold

**Question 5**

Telenet was licensed under which founder?

**Question 6**

What did Larry Roberts wish for?

**Question 7**

What did the BBN finance?

**Question 8**

Why was Telenet bought in 1979?

**Question 9**

Why didn't AT&T buy the technology?

**Question 10**

When AT&T funded the project, what technology did it use?

**Question 11**

Who was the head of GTE who wanted to make ARPANET technology public?

**Question 12**

How will the BBN monopoly react to Roberts?

**Question 13**

Which company was founded in 1975?

**Text number 15**

Tymnet was an international telecommunications network headquartered in San Jose, California, that used virtual circuit packet switching technology and X.25, SNA/SDLC, BSC and ASCII interfaces to connect thousands of host computers (servers) in large corporations, educational institutions and government agencies. Users typically connected via dial-up or dedicated asynchronous connections. The operation consisted of a large public network supporting dial-up users and a private network allowing government agencies and large corporations (mainly banks and airlines) to build their own stand-alone networks. Private networks were often connected to the public network through gateways to reach places not covered by the private network. Tymnet was also connected to dozens of other public networks in the US and internationally via X.25/X.75 gateways. (Interesting note: Tymnet was not named after Tyme. Another employee suggested the name. )

**Question 0**

What was Tymnet

**Question 1**

What the Tymnet brought together

**Question 2**

How a Tymnet user contacted

**Question 3**

Business allows private companies to do what they want

**Question 4**

The gateways allow private companies to do what

**Question 5**

Who did Tymnet work with?

**Question 6**

Why were private networks connected through gateways?

**Question 7**

Who suggested the name Tymnet?

**Question 8**

Dial up or dedicated asynchronous connections connected to who?

**Question 9**

Where were the servers located?

**Question 10**

Which international telecommunications network was headquartered in San Juan, California?

**Question 11**

Public networking enabled government agencies to do what?

**Question 12**

How was Tymnet connected to dozens of other private networks?

**Question 13**

How were X.75, ASCII and other interfaces used?

**Question 14**

Tymnet consisted of a large private network supporting whom?

**Text number 16**

There were two types of X.25 networks. Some, such as DATAPAC and TRANSPAC, were originally implemented with an external X. 25 interface. Some older networks, such as TELENET and TYMNET, were modified to provide an X.25 host interface in addition to the old host interconnection systems. DATAPAC was developed by Bell Northern Research, a joint venture between Bell Canada (a common carrier) and Northern Telecom (a telecommunications equipment supplier). Northern Telecom sold several DATAPAC clones to foreign PTT companies such as Deutsche Bundespost. X.75 and X.121 enabled the interconnection of national X.25 networks. A user or host could call a host on a foreign network by including the DNIC code of the remote network as part of the destination address [referenced ].

**Question 0**

How many different X.25 networks originally existed?

**Question 1**

Who developed DATAPAC

**Question 2**

What did the foreign clones of DATAPAC enable?

**Question 3**

What was implemented with the X.25 interface?

**Question 4**

What was sold to foreign PTTs?

**Question 5**

What did the DNIC let the host do?

**Question 6**

Deutsce Bundespost bought what kind of interface looks like likes?

**Question 7**

What helped X.25 networks?

**Question 8**

How were TRANSPAC and TYMNET changed?

**Question 9**

Bell Northern Research developed TRANSPAC as a joint venture between which two companies?

**Question 10**

To whom did Northen Telecom sell the TRANSPAC clones?

**Question 11**

What tools were used to implement TELENET and TRANSPAC?

**Question 12**

What did X.25 and X.121 enable?

**Text number 17**

AUSTPAC was the Australian public X. 25 network operated by Telstra. Established by Telecom Australia in the early 1980s, AUSTPAC was Australia's first public packet-switched data network, supporting, among other things, online betting, financial applications - the Australian Taxation Office used AUSTPAC - and remote access to academic institutions, which maintained their connections to AUSTPAC in some cases until the mid-1990s. Access can be via dial-up to the PAD or by connecting a permanent X.25 node to the network. [Reference needed]

**Question 0**

What was AUSTPAC

**Question 1**

What AUSTPAC support

**Question 2**

How AUSTPAC connections are made

**Question 3**

What did Telecom Australia start?

**Question 4**

What online framework was used to support online betting?

**Question 5**

What kind of connections did Telstra offer?

**Question 6**

Who had remote access?

**Question 7**

Why did the Australian Taxation Office use AUSTPAC?

**Question 8**

What did Telstra start in the early 1980s?

**Question 9**

What did the Australian Taxation Office use AUSTPAC to access remotely?

**Question 10**

What applications were not supported by AUSTPAC?

**Question 11**

What was the Australian public X.75 network operated by Telstra?

**Text number 18**

Datanet 1 was a public data network operated by the Dutch PTT Telecom (now KPN). Strictly speaking, Datanet 1 referred only to the network and the users connected to it via leased lines (using X.121 DNIC 2041), the name also referred to the public PAD service Telepad (using DNIC 2049). Since the Videotex main service used the network and modified PADs as infrastructure, these services were also referred to as Datanet 1. Although this use of the name was incorrect, the confusion was caused by the fact that all these services were managed by the same persons in one KPN department.

**Question 0**

What was DATANET 1

**Question 1**

Exactly who was part of DATANET 1?

**Question 2**

Who else DATNET 1 meant

**Question 3**

Was the use of the name DATANET 1 correct?

**Question 4**

What was confusing about KPN?

**Question 5**

Datanet 1 also referred to what?

**Question 6**

KPN called Datanet 1 as follows

**Question 7**

What was considered to be wrong with the services provided by KPN?

**Question 8**

Who manages KPN's Datanet 1?

**Question 9**

What did KPN's public Telepad service use?

**Question 10**

Which service used the network and changed KPN's equipment?

**Question 11**

What was the network operated by Duct PTT Telecom?

**Question 12**

Even if the name was correct, all these services are managed by whom?

**Text number 19**

The Computer Science Network (CSNET) was a computer network funded by the US National Science Foundation (NSF), which started in 1981. Its purpose was to extend network benefits to computer science departments in academic and research institutions that could not be directly connected to ARPANET due to funding or authorization restrictions. It played a major role in increasing awareness and access to the national network and was a significant milestone on the road to a global Internet.

**Question 0**

What is CSNET

**Question 1**

What was the purpose of CSNET

**Question 2**

Due to funding constraints, CSNET was able to be whatever

**Question 3**

What was considered a major milestone?

**Question 4**

Who spread awareness of national networking?

**Question 5**

Who benefited from CSNET?

**Question 6**

Which foundation funded Global Internet?

**Question 7**

Extended network benefits helped those who could not connect to which platform?

**Question 8**

What started in 1982?

**Question 9**

What was the purpose of the NSF?

**Question 10**

Why did academia and research institutions need NSF's help to join ARPANET?

**Question 11**

Where did ARPANET play a significant role?

**Question 12**

The NSF was a major milestone for what?

**Text number 20**

Internet2 is a US-based non-profit computer networking consortium led by members of the research and education communities, industry and governments. Together with Qwest, the Internet2 community built the first Internet2 network, the Abilene network, in 1998 and was the lead investor in the National LambdaRail (NLR) project. In 2006, Internet2 announced a partnership with Level 3 Communications to launch a brand new nationwide network with a capacity of 10 Gbit/s to 100 Gbit/s. In October 2007, Internet2 formally abandoned the Abilene network and now calls the new, higher capacity network the Internet2 network.

**Question 0**

what is the Internet2

**Question 1**

Who internet2 has partnered with

**Question 2**

What was the name of the first internet2 network

**Question 3**

Who internet2 has partnered with

**Question 4**

ableine retired, and the new platform is called

**Question 5**

Who did Qwest work with to create Internet2?

**Question 6**

What did the Level 3 communication trigger?

**Question 7**

What became of Internet2 in 2007?

**Question 8**

What was Abilene referring to?

**Question 9**

Which project created a network with a higher capacity?

**Question 10**

What was the first Internet2 network created with NLR?

**Question 11**

Who did Internet2 work with to increase its capacity from 100 Gbit/s to 1000 Gbit/s?

**Question 12**

Who runs the Qwest consortium?

**Question 13**

To which project was Abilene the main donor?

**Text number 21**

The National Science Foundation Network (NSFNET) was a National Science Foundation (NSF)-funded program of coordinated and emerging projects that began in 1985 to promote advanced research and education networking in the United States. NSFNET was also the name of several nationwide backbone networks, operating at 56 kbit/s, 1.5 Mbit/s (T1) and 45 Mbit/s (T3), built to support NSF network initiatives between 1985 and 1995. Originally created to connect researchers to NSF-funded supercomputing centres, it evolved through public funding and private industry partnerships into a major part of the Internet backbone.

**Question 0**

What is NSFNET

**Question 1**

What NSFNET contributed

**Question 2**

What NSFNET finally offered

**Question 3**

Which sponsor developed the advanced networking?

**Question 4**

What was the result of the research promoted in 1985?

**Question 5**

What was the original purpose of the NFS funding?

**Question 6**

What developments did public and private funding lead to?

**Question 7**

Why did advanced research and training in networking come into being?

**Question 8**

NSF was launched in 1985 to promote what?

**Question 9**

How did NSF develop with public funding and private partnerships?

**Question 10**

What was built to support the NSF between 1985 and 1999?

**Question 11**

Why was NSFUS originally created?

**Text number 22**

Very high-speed Backbone Network Service (vBNS) was introduced in April 1995 as part of a National Science Foundation (NSF)-funded project to provide high-speed connectivity between NSF-funded supercomputer centres and selected access points in the United States. The network was designed and operated by MCI Telecommunications under a cooperative agreement with NSF. By 1998, vBNS had grown to connect over 100 universities and research and engineering institutions through 12 national access points with DS-3 (45 Mbps), OC-3c (155 Mbps) and OC-12c (622 Mbps) links on the OC-12c backbone, a significant technical achievement at the time. In February 1999, vBNS installed one of the first OC-48c (2,5 Gbit/s) IP link production links and continued to upgrade the entire backbone network to OC-48c.

**Question 0**

what does vBNS mean

**Question 1**

What vBNS did

**Question 2**

Who used the vBSN network

**Question 3**

How many universities had been affiliated by 199?

**Question 4**

What the network installed in 1999

**Question 5**

What were the selected sites connected to?

**Question 6**

How were high-speed connections maintained and who controlled them?

**Question 7**

Who signed the cooperation agreement?

**Question 8**

Why was the OC-12c considered a major technical achievement?

**Question 9**

When was the OC-12c updated?

**Question 10**

Why was NSFBNS created?

**Question 11**

Who designed and operated the NSF?

**Question 12**

NSF grew to bring together how many universities?

**Question 13**

NSF installed one of the first in February 1999?

**Question 14**

How many branches did NSFBNS have by 1998?

**Document number 456**

**Text number 0**

The Black Death is believed to have originated in the arid plains of Central Asia, from where it travelled along the Silk Road to Crimea by 1343. From there, it was probably introduced by oriental rat colonies living on the black rats that were regular passengers on merchant ships. The Black Death spread throughout the Mediterranean and Europe, killing an estimated 30-60% of the European population. Overall, the plague reduced the world population from an estimated 450 million to 350-375 million in the 13th century. The world population as a whole did not return to pre-plague levels until the 17th century. The plague occurred sporadically in Europe until the 19th century.

**Question 0**

Where did the black death come from?

**Question 1**

How did the Black Death reach the Mediterranean and Europe?

**Question 2**

How much of the European population was killed by the Black Death?

**Question 3**

When did the world's population finally recover from the Black Death?

**Question 4**

How long did the plague stay here?

**Question 5**

In what year did the Black Death originate in Central Asia?

**Question 6**

How did the Black Death travel along the Silk Road?

**Question 7**

What percentage of people died in black deaths in Central Asia?

**Question 8**

What percentage of people died in Crimea in the Black Death?

**Question 9**

What year did the Black Death arrive in the Mediterranean?

**Text number 1**

Plague caused by the bacterium Yersinia pestis (Yersinia pestis) is endemic (common) in flea populations carried by terrestrial rodents, including marmots, in various regions, including Central Asia, Kurdistan, West Asia, northern India and Uganda. In Kyrgyzstan, the tombs of Nestorius near Lake Issyk Kul, dating from 1338-39, contain carvings suggestive of the plague, which many epidemiologists believe mark the start of an outbreak that could have easily spread to China and India. In October 2010, medical geneticists suggested that all three major plague outbreaks originated in China. In China, the Mongol conquest in the 13th century caused a decline in agriculture and trade. However, there was an economic recovery in the early 1300s. In the 1330s, a large number of natural disasters and epidemics led to a widespread famine that began in 1331, followed shortly afterwards by the deadly plague. The epidemics, which may have included the plague, killed an estimated 25 million Chinese and other Asians in the 15 years before it reached Constantinople in 1347.

**Question 0**

What does it mean that the disease is endemic?

**Question 1**

How old are gravestones referring to the plague?

**Question 2**

Where do scientists believe all plagues originated?

**Question 3**

When did the Chinese famine start?

**Question 4**

How many people did this epidemic kill in China?

**Question 5**

What year did the plague spread to Central Asia?

**Question 6**

In what year did the Mongol conquest of China begin?

**Question 7**

How many people lived in China in the 13th century?

**Question 8**

In which country is Constantinople located?

**Question 9**

What is the term for a disease that is not common?

**Text number 2**

The plague was first introduced to Europe by Genoese traders in the Crimean port city of Kaffa in 1347. After a prolonged siege during which a Mongol army led by Jani Beg suffered from the disease, the army threw infected bodies over the walls of the city of Kaffa to infect the inhabitants. Genoese traders fled, taking the plague by ship to Sicily and southern Europe, where it spread northwards. Whether or not this hypothesis is correct, it is clear that a number of existing circumstances, such as war, famine and weather, contributed to the severity of the Black Death.

**Question 0**

Who brought the plague to Europe?

**Question 1**

To whom did the military siege belong?

**Question 2**

What did the Mongol army throw with their catapults?

**Question 3**

Where did Genoese traders bring the plague?

**Question 4**

What contributed to the severity of the plague?

**Question 5**

In what year did Jani Beg become the leader of the Mongolian army?

**Question 6**

In what year was Kaffa founded?

**Question 7**

Who else but Genoa did business with Kaffa?

**Question 8**

To which city in Sicily did the Genoese traders flee?

**Question 9**

Whose infected body was one of those thrown over the walls of Kaffa by the Mongol army?

**Text number 3**

From Italy, the disease spread north-west across Europe, hitting France, Spain, Portugal and England by June 1348, before turning and spreading eastwards through Germany and Scandinavia between 1348 and 1350. The disease spread to Norway in 1349 when a ship landed at Askøy, and then spread to Bjørgvin (now Bergen) and Iceland. Finally, it spread to north-west Russia in 1351. The plague was somewhat less common in parts of Europe with fewer trade links with their neighbours, such as the Kingdom of Poland, most of the Basque Country, isolated parts of Belgium and the Netherlands, and isolated Alpine villages across the continent.

**Question 0**

Which way did the disease move first?

**Question 1**

Which country was the last to contract the disease?

**Question 2**

Which European groups were able to avoid the plague?

**Question 3**

Where did the disease spread between 1348 and 1350?

**Question 4**

When did the plague ship land in Norway?

**Question 5**

In what month and year did the Black Death spread to France?

**Question 6**

Which country's ship landed in Oskoi?

**Question 7**

What year did the Black Death spread to Iceland?

**Question 8**

With whom did the Kingdom of Poland trade?

**Question 9**

Which was one of the countries with isolated alpine villages?

**Text number 4**

During the pandemic, the plague struck several countries in the Middle East, leading to severe depopulation and permanent changes in both economic and social structures. As the disease spread to Western Europe, it also entered the region from Southern Russia. In the autumn of 1347, the plague reached Alexandria in Egypt, probably through trade with the port of Constantinople, and the ports of the Black Sea. During 1347 the plague spread eastwards to Gaza and along the east coast northwards to cities in Lebanon, Syria and Palestine, including Ashkelon, Acre, Jerusalem, Sidon, Damascus, Homs and Aleppo. In 1348-49 the disease reached Antioch. The inhabitants of the city fled north, most of them dying on the way, but the infection had also spread to the people of Asia Minor[citation needed].

**Question 0**

How did the plague affect the Middle East?

**Question 1**

When did the plague arrive in Alexandria?

**Question 2**

How did the plague invade Alexandria?

**Question 3**

Where did the people of Antioch flee to?

**Question 4**

What year did the plague start in the Middle East?

**Question 5**

Where did the people of Antioch flee to in the plague?

**Question 6**

In what years did the infection spread to the people of Asia Minor?

**Question 7**

Which was one of the cities that had a port on the Black Sea?

**Question 8**

Which country was Damascus in?

**Text number 5**

Gasquet (1908) claimed that the Latin name atra mors (black death) for the 13th century epidemic first appeared in modern times in 1631 in a book on the history of Denmark by J.I. Pontanus: "Vulgo & ab effectu atram mortem vocatibant." ("Generally and by its effects it was called the black death"). The name spread in Scandinavia and then in Germany, and was gradually associated with the mid-13th century epidemic as a proper name. In England, the medieval epidemic was first called the Black Death only in 1823.

**Question 0**

Who claimed that the name Black Death first appeared in 1631?

**Question 1**

What is the Latin name of the Black Death?

**Question 2**

Who is said to have invented the name Black Death?

**Question 3**

When did the term 'black death' officially take root in England?

**Question 4**

Did the plague spread first in Scandinavia or Germany?

**Question 5**

In what year did the term "Black Death" spread to Germany?

**Question 6**

What year did the Black Death spread to England?

**Question 7**

In what year was J.I. Pontanus born?

**Question 8**

In what year in Scandinavia did the plague start to be called the Black Death?

**Question 9**

What is the Latin name for Germany?

**Text number 6**

Medical knowledge had stagnated in the Middle Ages. At the time, the most authoritative account came from the Paris medical faculty in a report to the King of France, which blamed the heavens for the 1345 merger of three planets that caused the "great plague of the air". This report became the first and most widely circulated of the plague texts, which sought to give advice to sufferers. The theory that the plague was caused by bad air became the most widely accepted theory. Today this is known as the miasma theory. The word 'plague' had no particular meaning at the time, and it was only the repeated outbreaks in the Middle Ages that gave it the name it has become a medical term.

**Question 0**

What was originally blamed for the Black Death?

**Question 1**

To whom is the medical report written?

**Question 2**

What is the newer, more widely accepted theory of plague spread?

**Question 3**

What is the official name of the bad air theory?

**Question 4**

In which city did the King of France live?

**Question 5**

What actually caused the plague?

**Question 6**

In what year was the Paris medical faculty founded?

**Question 7**

In what year did medical knowledge begin to stagnate in the Middle Ages?

**Text number 7**

The dominant explanation for the Black Death is the plague theory, which attributes the outbreak to the bacterium Yersinia pestis, which was also responsible for the epidemic that started in southern China in 1865 and eventually spread to India. The 19th century plague pathogen was first investigated by teams of scientists visiting Hong Kong in 1894, including the Franco-Swiss bacteriologist Alexandre Yersin, who named the pathogen Yersinia pestis. In 1898, Paul-Louis Simond elucidated the mechanism by which Y. pestis was usually transmitted, and found it to be associated with the bites of fleas whose guts had become clogged by multiplying Y. pestis several days after they had eaten an infected host. The blockage leads to starvation and aggressive feeding behaviour by the fleas, which repeatedly attempt to remove the blockage by burping, resulting in thousands of plague bacteria being flushed into the feeding site and infecting the host. The bubonic plague mechanism was also dependent on two rodent populations: one was resistant to the disease, acting as a host to keep the disease endemic, and the other was resistant. When one population dies, the fleas are transmitted to other hosts, including humans, causing a miraculous epidemic.

**Question 0**

What was responsible for the black death and epidemic in southern China?

**Question 1**

Where and when did the investigation into the plague pathogen begin?

**Question 2**

Who is yersinia pestis named after?

**Question 3**

What was founded by Paul-Louis Simond in 1898?

**Question 4**

What was the bubonic plague mechanism based on?

**Question 5**

When did the Black Death spread to India?

**Question 6**

What year did Alexandre Yersin discover Yersinia pestis?

**Question 7**

What nationality was Paul-Louis Simond?

**Question 8**

Who was the second scientist, apart from Alexandre Yersin, to visit Hong Kong in 1894?

**Question 9**

Who named the pathogen Yersinia pestis?

**Text number 8**

Historian Francis Aidan Gasquet wrote of the "great plague" in 1893 and suggested that "it seems to be some kind of ordinary oriental plague or bubonic plague". He was able to adopt the epidemiology of the bubonic plague for the second edition of Black Death in 1908, linking it to rats and fleas, and his interpretation was widely accepted for other ancient and medieval epidemics, such as Justinian's plague in the Eastern Roman Empire from 541 to 700 AD.

**Question 0**

Who wrote about the Great Plague of 1893?

**Question 1**

What did Gasquet think the plague was?

**Question 2**

When was the second edition of Gasquet's book published?

**Question 3**

What did Gasquet's book blame the plague for?

**Question 4**

What other plague is believed to have spread in the same way?

**Question 5**

When was Francis Aidan Gasquet born?

**Question 6**

When did the bubonic plague start in Europe?

**Question 7**

What was the name of Justinian's plague epidemic?

**Question 8**

In what year was the Eastern Roman Empire founded?

**Text number 9**

Modern researchers have suspected other forms of plague. Modern bubonic plague has a mortality rate of 30-75% and symptoms include fever of 38-41°C, headache, painful joint pain, nausea and vomiting, and general malaise. If left untreated, 80% of people with bubonic plague die within eight days. The mortality rate for pneumonic plague is 90-95%. Symptoms include fever, cough and bloody sputum. As the disease progresses, the sputum becomes runny and bright red. Septicaemic plague is the rarest of the three forms, with a mortality rate of almost 100%. Symptoms include high fever and purple patches of skin (purpura due to disseminated intravascular coagulation). In the case of pneumonic plague, and especially septic plague, the disease progresses so rapidly that there is often no time to develop the enlarged lymph nodes that were found in the abscesses.

**Question 0**

What is the mortality rate of modern bubonic plague?

**Question 1**

How high does plague fever get?

**Question 2**

What percentage of untreated plague victims die within 8 days?

**Question 3**

What is the mortality rate for COPD?

**Question 4**

Which skin-related symptom is manifested by pneumoconiosis?

**Question 5**

What colour is the sputum of septicemic plague patients?

**Question 6**

What temperature is the fever in someone with pneumonia?

**Question 7**

How high is the fever in someone with septicemic plague?

**Question 8**

How quickly does septic blood poisoning kill most people if left untreated?

**Question 9**

How quickly does pneumonic plague usually kill most people if left untreated?

**Text number 10**

In October 2010, an article by a multinational team published in the open access journal PLoS Pathogens re-examined the role of Yersinia pestis in the Black Death after its identification was disputed by Drancourt and Raoult in 1998. They used polymerase chain reaction (PCR) techniques to assess the presence of Y. pestis DNA/RNA in human skeletal toothpicks from mass graves in northern, central and southern Europe that were archaeologically associated with the Black Death and subsequent relapses. The authors concluded that this new study, together with previous analyses from southern France and Germany, "... concludes the debate on the aetiology of the Black Death and unequivocally demonstrates that Y. pestis was the cause of the epidemic that devastated Europe in the Middle Ages".

**Question 0**

When was Plos Pathogens magazine published?

**Question 1**

What was Plos Pathogens all about?

**Question 2**

How do scientists assess the DNA/RNA of Yersinia pestis?

**Question 3**

Where did the researchers find their Y. pestis samples?

**Question 4**

What does Plos Pathogen claim?

**Question 5**

What year was PloS Pathogens first released?

**Question 6**

In which country is PloS Pathogens headquartered?

**Question 7**

In what year were polymerase chain reactions first used by scientists?

**Question 8**

Which French scientific journal published a preliminary analysis of the black death?

**Question 9**

In which month was the Drancourt and Raoult study published in 1998?

**Text number 11**

The study also found that two previously unknown but related clades (genetic branches) of the Y. pestis genome are associated with medieval mass graves. These clades (believed to be extinct) were found to be ancestors of the current Y. pestis strains Y. p. orientalis and Y. p. medievalis, suggesting that the plague may have entered Europe in two waves. Studies of the remains of plague pits in France and England show that the first variant entered Europe via the port of Marseilles around November 1347, spread through France over the next two years and finally arrived in England in the spring of 1349, where it spread in three epidemics. Studies of the remains of plague pits from the Dutch town of Bergen op Zoom showed that the Y. pestis genotype in the Netherlands from 1350 differed from that observed in Britain and France, suggesting that Bergen op Zoom (and possibly other parts of the southern Netherlands) was not directly infected from England or France in 1349, and suggesting that a second wave of plague, different from the British and French plague outbreaks, may have entered the Netherlands from Norway, the Hanseatic cities or elsewhere.

**Question 0**

What are clades?

**Question 1**

What strains of y. pestis were found in mass graves?

**Question 2**

What do y. pestis strains indicate about plague?

**Question 3**

How and when did the first variant of y. pestis enter Europe?

**Question 4**

When did y. pestis arrive in England?

**Question 5**

In what year was Marseille founded?

**Question 6**

What year did the plague hit the Netherlands?

**Question 7**

What was one of the Hanseatic cities?

**Question 8**

In what month in 1349 did the plague arrive in England in a second wave?

**Question 9**

From which country does the Y. p. orientalis genome originate?

**Text number 12**

The results of Haensch's study have since been confirmed and modified. Based on genetic evidence from victims of the black death at East Smithfield Cemetery in England, Schuenemann et al. concluded in 2011 "that the black death in medieval Europe was caused by a variant of the Y. pestis bacterium that may no longer exist". The study, published in October 2011 in the journal Nature, sequenced the genome of Y. pestis from plague victims and showed that the strain that caused the Black Death is the ancestor of most of today's disease strains.

**Question 0**

What is the current state of Haensch research?

**Question 1**

Where was the burial site used in the tests located?

**Question 2**

What is thought to have happened to the y. pestis bacterium that caused the Black Death?

**Question 3**

When was the study on sequenced Y genomes published?

**Question 4**

In what year was the Haensch study published?

**Question 5**

Who wrote the study published in Nature in October 2011?

**Question 6**

What was Schuenemann's first name?

**Question 7**

What year were the East Smithfield black slaying victims found?

**Text number 13**

The plague theory was first significantly challenged by British bacteriologist J. F. D. Shrewsbury in 1970, who noted that reported mortality rates in rural areas during the 13th century pandemic were inconsistent with modern bubonic plague, leading him to conclude that contemporary reports were exaggerations. In 1984, zoologist Graham Twigg presented the first major work directly challenging the bubonic plague theory, and his doubts about the identity of the Black Death have been followed up by several authors, including Samuel K. Cohn Jr. (2002), David Herlihy (1997) and Susan Scott and Christopher Duncan (2001).

**Question 0**

Who was the first to question the plague theory?

**Question 1**

What did Shrewsbury say about the plague?

**Question 2**

What was Shrewsbury's conclusion?

**Question 3**

What did Graham Twigg publish in 1984?

**Question 4**

Who discussed the Twigg study in 2002?

**Question 5**

Who first invented the boomerang theory?

**Question 6**

What is Samuel K. Cohn Jr's career?

**Question 7**

What kind of scientist is David Herlihy?

**Question 8**

Who invented the term "black death"?

**Question 9**

In what year did Samuel K. Cohn Jr. read Graham Twigg's magnum opus?

**Text number 14**

It is recognised that epidemiological investigation of the plague is as important as identifying the symptoms, but the lack of reliable statistics for this period makes the work of researchers difficult. Most of the work has been done on the spread of plague in England, and even estimates of the total population at the beginning of the plague vary by more than 100% because no census was taken between the publication of the Domesday Book and 1377. Estimates of plague victims are usually extrapolated from figures provided by the clergy.

**Question 0**

What is as important as recognising the symptoms of plague?

**Question 1**

Why are researchers struggling to unravel the plague story?

**Question 2**

How much do estimates of the population at the time of the plague vary?

**Question 3**

What can be used to extrapolate population estimates?

**Question 4**

In which years was no census taken?

**Question 5**

What year did the plague start in England?

**Question 6**

What year was the Domesday Book written?

**Question 7**

What is the Domesday Book about?

**Question 8**

In what year did the clergy arrive in England?

**Text number 15**

Skeptics of the bubonic plague theory argue that the rat population was insufficient to explain the bubonic plague pandemic, and they also point out that the symptoms of the Black Death are not unique (and that in some cases they may differ from bubonic plague), that flea-borne contamination of goods was probably marginal, and that DNA results may be erroneous and may not have been reproducible elsewhere, even though they were widely sampled from other mass graves. Other arguments include the fact that there are no reports of rat deaths prior to plague epidemics in the 1300s and 1600s; that temperatures in northern Europe were too cold for fleas to survive; that, despite primitive transport systems, the spread of black death was much faster than the spread of modern bubonic plague; that black death mortality appears to have been very high; that while modern bubonic plague is largely an endemic disease in rural areas, the Black Death struck indiscriminately in urban and rural areas; and that the course of the Black Death, in which large outbreaks occurred in the same areas every 5-15 years, differs from modern bubonic plague, which often spreads endemically for decades and outbreaks occur annually.

**Question 0**

Why couldn't rats be responsible for the plague?

**Question 1**

How significant was the transmission of the disease through fleas?

**Question 2**

Why might temperature affect the theory of plague spread?

**Question 3**

Was the boom faster or slower than the modern boom?

**Question 4**

How many years could have passed between the onset of the Black Death?

**Question 5**

In which century did the modern bubonic plague hit Europe?

**Question 6**

Is the weather in southern Europe suitable for fleas?

**Question 7**

How did the Black Death spread in Europe?

**Question 8**

How many years did it take for the Black Death to spread across Europe?

**Question 9**

How long did it take you to travel across Europe with rudimentary transport systems?

**Text number 16**

Several alternatives have been proposed for Y. pestis. Twigg suggested a form of anthrax, and Norman Cantor (2001) speculated that it may have been a combination of anthrax and other pandemics. Scott and Duncan have argued that the pandemic was a form of infectious disease, described as an Ebola-like haemorrhagic disease. Archaeologist Barney Sloane has argued that there is insufficient evidence in the archaeological record of the medieval London waterfront of the extinction of large numbers of rats and that the plague spread too quickly to support the thesis that Y. pestis was spread by rat fleas; he argues that infection must have been human-to-human. However, no single alternative solution has gained widespread acceptance. Many researchers who argue that Y. pestis was the main cause of the pandemic suggest that its extent and symptoms can be explained by a combination of bubonic plague and other diseases such as typhoid, smallpox and respiratory infections. In addition to bubonic plague, others point to septicaemic (a form of 'blood poisoning') and pneumonic (an airborne plague that invades the lungs before the rest of the body) forms of plague, which prolong the duration of outbreaks in all seasons and contribute to the high mortality rate and additional symptoms recorded. In 2014, researchers from Public Health England reported the results of 25 bodies excavated from the Clerkenwell area of London, as well as testaments registered in London at the time, which supported the pneumonic plague hypothesis.

**Question 0**

What does Graham Twigg suggest about the spread of disease?

**Question 1**

What was Norman Cantor's theory of plague?

**Question 2**

Which diseases do many researchers think contributed to the plague pandemic?

**Question 3**

What is blood poisoning?

**Question 4**

How many bodies did Public Health England dig up?

**Question 5**

What was Twigg's first name?

**Question 6**

What kind of scientist is Norman Cantor?

**Question 7**

Who was one of Public Health England's researchers in 2014?

**Question 8**

What year was the Scott and Duncan study published?

**Question 9**

Who found Y. pestis?

**Text number 17**

The most widely accepted estimate of the mortality rate in the Middle East, including Iraq, Iran and Syria, during this period is around one third. The Black Death killed about 40% of Egypt's population. Half of Paris' population of 100 000 died. In Italy, Florence's population fell from 110-120 thousand in 1338 to 50 thousand in 1351. At least 60% of the population of Hamburg and Bremen died, and a similar percentage of Londoners may have died of disease. Interestingly, although contemporary reports suggest that mass graves were created to cope with the high death toll, recent scientific research in a central London burial pit found that well-preserved individuals were buried in single, evenly spaced graves, suggesting at least some degree of pre-planning and Christian burials at the time. Before 1350, Germany had about 170 000 inhabitants, a number which had fallen by almost 40 000 by 1450. In 1348, the plague spread so rapidly that before doctors or authorities had time to consider its origin, about a third of Europe's population had already died. In crowded cities, it was common for up to 50% of the population to die. The disease bypassed some areas, and the outermost regions were less susceptible to infection. Monks and priests were particularly badly affected, as they treated the victims of the black death.

**Question 0**

How much of the Middle East's population died from the plague?

**Question 1**

How much of the population of Paris died from the plague?

**Question 2**

What do the separate, disconnected graves of the plague victims tell us?

**Question 3**

How many people would die of plague in large populated cities?

**Question 4**

Which areas were least susceptible to disease?

**Question 5**

How many people were living in Egypt when the Black Death began?

**Question 6**

In which country is Hamburg located?

**Question 7**

Where did the plague start?

**Question 8**

What percentage of monks and priests died in the Black Death?

**Question 9**

What percentage of people in isolated areas of Europe died in the Black Death?

**Text number 18**

The plague returned repeatedly to haunt Europe and the Mediterranean in the 1300s and 1700s. According to Biraben, the plague appeared somewhere in Europe every year between 1346 and 1671. The second pandemic was particularly widespread in 1360-63, 1374, 1400, 1438-39, 1456-57, 1464-66, 1481-85, 1500-03, 1518-31, 1544-48, 1563-66, 1573-88, 1596-99, 1602-11, 1623-40, 1644-54 and 1664-67. Subsequent outbreaks, albeit severe, marked the withdrawal of the disease from most of Europe (in the 1700s) and North Africa (in the 1800s). According to Geoffrey Parker, 'France alone lost nearly a million people to plague in the 1628-31 epidemic'.

**Question 0**

When did the plague return to Europe?

**Question 1**

What did Biraben say about the plague in Europe?

**Question 2**

How many French people died of the plague in 1628-31?

**Question 3**

What is Biraben's first name?

**Question 4**

When did the first pandemic end?

**Question 5**

Where is Geoffrey Parker from?

**Question 6**

Where is Biraben from?

**Question 7**

How many people died in the Black Death in North Africa?

**Text number 19**

In the absence of census data for England, historians suggest that the population before the disaster ranged from 7 million to 4 million in 1300, and up to 2 million after the disaster. By the end of 1350, the Black Death subsided, but it never disappeared from England. Over the next few hundred years, further outbreaks occurred in 1361-62, 1369, 1379-83, 1389-93 and throughout the first half of the 15th century. An outbreak in 1471 killed up to 10-15% of the population, and in 1479-80 the death rate from plague may have been as high as 20%. The most common outbreaks in Tudor and Stuart England appear to have started in 1498, 1535, 1543, 1563, 1589, 1603, 1625 and 1636 and ended with the Great Plague of London in 1665.

**Question 0**

What did historians do when there were no census figures?

**Question 1**

When did the black death technically subside?

**Question 2**

How many people died in the 1471 outbreak?

**Question 3**

When was the Great Plague in London?

**Question 4**

What percentage of London's population died during the Black Death of 1589?

**Question 5**

What percentage of people died during the Great London Plague of 1665?

**Question 6**

In what year did the Tudor era begin in England?

**Question 7**

What was the population of Europe in 1665?

**Question 8**

What percentage of the population died in the Black Death of 1625?

**Text number 20**

In 1466, perhaps 40 000 people died of the plague in Paris. In the 1500s and 1600s, the plague occurred in Paris about 30% of the time. The Black Death raged in Europe for three years before spreading to Russia, where the disease appeared somewhere in the country 25 times between 1350 and 1490. A plague epidemic struck London in 1563, 1593, 1603, 1625, 1636 and 1665, with a population decline of between 10 and 30% in those years. More than 10% of Amsterdam's population died in 1623-25 and again in 1635-36, 1655 and 1664. Venice had 22 outbreaks of plague between 1361 and 1528. 50 000 people died of plague in Venice between 1576 and 1577, almost a third of the population. Late outbreaks in Central Europe included the Italian plague of 1629-1631, linked to mass movements during the Thirty Years' War, and the Great Plague of Vienna in 1679. More than 60% of the Norwegian population died between 1348-50. The last plague epidemic was in Oslo in 1654.

**Question 0**

How many people died of the plague in Paris in 1466?

**Question 1**

The Black Plague ravaged Europe for three years, after which country?

**Question 2**

How many times did the plague appear in Venice?

**Question 3**

What outbreak was associated with the troops in the Thirty Years' War?

**Question 4**

When was the last plague outbreak?

**Question 5**

What percentage of the population of Paris died of the plague in 1466?

**Question 6**

How many people lived in Oslo at the start of the plague epidemic in 1654?

**Question 7**

What percentage of the population of Venice died of the plague in 1361?

**Question 8**

Who did Italy fight during the Thirty Years' War?

**Question 9**

How many people lived in Norway in 1348?

**Text number 21**

In the first half of the 17th century, the plague claimed around 1.7 million victims in Italy, or about 14% of the population. In 1656, the plague killed about half of Naples' 300 000 inhabitants. More than 1.25 million people died in 17th century Spain from the plague, which was extremely common. The plague of 1649 probably halved the population of Seville. The plague epidemic following the Great Northern War (1700-21, Sweden v Russia and allies) in 1709-13 killed about 100 000 people in Sweden and 300 000 in Prussia. The plague killed two-thirds of the population of Helsinki and claimed a third of Stockholm. Europe's last major epidemic occurred in Marseilles in 1720.

**Question 0**

How many people died of the plague in Italy in the 17th century?

**Question 1**

How many people died of the plague in Naples in 1656?

**Question 2**

How many inhabitants of Seville died of the plague in 1649?

**Question 3**

Who fought in the Great Northern War?

**Question 4**

When was the last time there was a major epidemic in Europe?

**Question 5**

In which country is Seville located?

**Question 6**

What was one of Russia's allies in the Great Northern War?

**Question 7**

What percentage of the Spanish population died of the plague in the 17th century?

**Question 8**

What was the population of Stockholm?

**Question 9**

In which country is Marseille located?

**Text number 22**

The Black Death ravaged much of the Islamic world. The plague occurred in at least one place in the Islamic world almost every year between 1500 and 1850. The plague struck repeatedly in North African cities. In Algiers, it killed 30-50 000 inhabitants between 1620-21 and again in 1654-57, 1665, 1691 and 1740-42. The plague was a major event in Ottoman society until the second quarter of the 19th century. Thirty-seven major and minor epidemics were recorded in Constantinople between 1701 and 1750, and a further thirty-one epidemics between 1751 and 1800. Baghdad has suffered badly from plague attacks, sometimes losing two-thirds of its population.

**Question 0**

During which years did the plague appear in Islamic countries?

**Question 1**

How many people disappeared in Algeria between 1620 and 21?

**Question 2**

How long did the plague last in the Ottoman Empire?

**Question 3**

How many people in Baghdad have died from the plague?

**Question 4**

In what year did Baghdad residents first contract the plague?

**Question 5**

How many people lived in Constantinople in 1701?

**Question 6**

How many people died of plague in Ottoman society in the 19th century?

**Question 7**

How many times did the plague visit Baghdad?

**Question 8**

How many times did the plague visit Ottoman society before the second quarter of the 19th century?

**Document number 457**

**Text number 0**

There are three types of rock: igneous, sedimentary and metamorphic. The rock cycle is an important geological concept that illustrates the relationship between these three rock types and magma. When a rock crystallises from a melt (magma and/or lava), it is an igneous rock. This rock may be weathered and eroded, then redeposited and fossilised as sedimentary rock, or it may become metamorphic rock under the influence of heat and pressure, which change the mineral content of the rock, giving it its characteristic structure. The sedimentary rock may then subsequently become metamorphic rock under the influence of heat and pressure, and then weather, erode, stratify and fossilize, eventually becoming sedimentary rock. Sedimentary rock can also erode and redeposit, and metamorphic rock can also undergo further metamorphism. All three types of rocks can melt again, forming new magma that can then crystallise again into igneous rock.

**Question 0**

A rock is a stone that crystallises from what?

**Question 1**

Sedimentary rock can be made from which of the three types of rock?

**Question 2**

What is formed when three types of rock are remelted?

**Question 3**

What are the three main types of stone?

**Question 4**

What changes the mineral content of a rock?

**Question 5**

What are the three types of crystallisation?

**Question 6**

What is an important concept in crystallisation?

**Question 7**

What type of mineral crystallises from erosion?

**Question 8**

What changes the way a mineral is deposited?

**Question 9**

What happens when three types of minerals are re-deposited and their properties change?

**Question 10**

What illustrates the relationship between stone and crystal?

**Question 11**

What type of stone cannot be remelted?

**Question 12**

How is a stone fossilised?

**Question 13**

What does heat prevent from changing in the crystallisation process?

**Question 14**

What gives sedimentary rock its typical structure?

**Text number 1**

In the 1960s, a series of discoveries, the most important of which was the spreading of the seafloor, showed that the Earth's lithosphere, comprising the crust and the rigid upper mantle, is divided into several tectonic plates that move through a plastically deformable, solid upper mantle called the asthenosphere. Plate motion at the surface and mantle convection are closely related: ocean plate motion and mantle convection currents always move in the same direction because the ocean lithosphere is the rigid upper thermal boundary layer of the convective mantle. This coupling between rigid plates moving on the Earth's surface and the convective mantle is called plate tectonics.

**Question 0**

What was the most important discovery that led to the understanding that the Earth's lithosphere is divided into tectonic plates?

**Question 1**

Which parts of the Earth belong to the lithosphere?

**Question 2**

What is another word for the upper mantle of the Earth?

**Question 3**

Plate tectonics can be seen as a close coupling between rigid plates on the earth's surface and what.

**Question 4**

In which decade was the spreading of the seabed detected?

**Question 5**

When was the most important discovery about thermal limits made?

**Question 6**

What is another word for seabed spreading?

**Question 7**

Which way do ocean currents and seabed spreading always move?

**Question 8**

What is involved in the interconnection of ocean currents?

**Question 9**

What is another term for sea currents?

**Question 10**

What are the different continental plates called?

**Question 11**

Why do ocean plates and mantle convection currents move in opposite directions?

**Question 12**

What is the name of the lower thermal boundary layer?

**Question 13**

When was the lithosphere discovered?

**Question 14**

What is the name of the lithosphere and asthenosphere when they are together?

**Text number 2**

The development of plate tectonics provided the physical basis for many observations of the solid Earth. Long linear regions of geological features could be explained as plate boundaries. Mid-Eastern ridges, high areas of the seafloor with hydrothermal vents and volcanoes, were explained as divergent boundaries where two plates move apart. Volcanic and earthquake arcs were explained as convergent boundaries, where one continental plate sinks beneath another. Convergence boundaries, such as the San Andreas fault system, led to widespread strong earthquakes. Plate tectonics also provided a mechanism for Alfred Wegener's theory of continental drift, where continents move across the Earth's surface over geological time. It also provided the driving force for the deformation of the Earth's crust and the observation of the geology of building in the new environment. The power of plate tectonics theory lies in its ability to combine all these observations into a single theory of how the lithosphere moves over the convective mantle.

**Question 0**

What is the name of the area where two discs move apart?

**Question 1**

What is the name of the area where one continental plate sinks under another?

**Question 2**

What is the definition of a fault boundary that includes widespread strong earthquakes, as in the state of California?

**Question 3**

Whose theory was the theory of continental drift?

**Question 4**

In plate tectonics theory, the lithosphere moves over which mantle?

**Question 5**

What did the San Andreas Fault theory do?

**Question 6**

What was the name given to the ridges and geological features of the highlands of the central ocean?

**Question 7**

What happened as a result of hydrothermal eruptions and underwater volcanoes, which are transformational boundaries?

**Question 8**

What holds up the theory of variational limits?

**Question 9**

Who discovered continental plate tectonics?

**Question 10**

Why was Wegener's theory important for understanding the lithosphere?

**Question 11**

In which ocean are the volcanic arches located?

**Question 12**

What is the mechanism of continental plate tectonics?

**Question 13**

What happens when one plate touches another?

**Text number 3**

Seismologists can use seismic wave arrival times in reverse to describe the interior of the Earth. Early results in this field showed that there is a liquid outer core (where shear waves could not propagate) and a dense solid inner core. These advances led to the development of a layered model of the Earth with the crust and lithosphere on top, the mantle below (separated by seismic discontinuities at 410 and 660 km) and the outer and inner cores below. More recently, seismologists have been able to create detailed images of wave speeds inside the Earth in the same way that a doctor images the body in a CT scan. These images have provided a much more detailed picture of the Earth's interior, replacing the simplified layered model with a much more dynamic model.

**Question 0**

What kind of waves do seismologists use to describe the Earth's interior?

**Question 1**

What is the outermost layer in the Earth's layer model?

**Question 2**

In the earth layer model, there are two layers under the mantle. What are they?

**Question 3**

At which layer in the Earth's layer model are there seismic discontinuities?

**Question 4**

Recently, a more detailed model of the Earth was developed. Seismologists were able to create it using images taken from the interior of the Earth?

**Question 5**

What do seismologists use to map the Earth's crust?

**Question 6**

What could not see through the Earth's dense solid core?

**Question 7**

How many kilometres apart are the shear waves when measured in the envelope?

**Question 8**

What have CT scans led to for doctors and their patients?

**Question 9**

In what layered model of the Earth is the inner core separated?

**Question 10**

What is the name of the external kernel?

**Question 11**

What is the size of the nappy?

**Question 12**

How fast do wave speeds move inside the country?

**Text number 4**

The following four timelines describe the geological time scale. The first shows the entire period from the formation of the Earth to the present, but summarises the most recent eon. Therefore, the second scale shows the most recent eon on an extended scale. The second scale condenses the most recent epoch, so the third scale has the most recent epoch expanded. Since the quaternary epoch is a very short period with short epochs, it is further expanded in the fourth scale. The second, third and fourth time scales are therefore each sub-scales of the previous time scale, as indicated by the asterisks. The Holocene (the most recent epoch) is too small to be clearly visible on the third timeline on the right, which is another reason for the extension of the fourth scale. The Pleistocene (P) epoch. Q denotes a quarter of a century.

**Question 0**

Why is a second timeline needed?

**Question 1**

What timeline is further extended in the fourth scale?

**Question 2**

What is the name of the latest era?

**Question 3**

What is the period of the Pleistocene era?

**Question 4**

What does the second timeline summarise?

**Question 5**

What has the first timeline added to the timeline to extend it?

**Question 6**

Why is the most recent era being extended at the first scale?

**Question 7**

Where will the holocene be extended further, as it is very short and contains short periods of time?

**Question 8**

Why is the holocene not clearly visible on the first timeline?

**Question 9**

What is the biggest eon?

**Question 10**

Which timeline is the most accurate?

**Question 11**

How many eras are there?

**Question 12**

What does the fourth scale summarise?

**Question 13**

On the second scale, what is the name of the extended era?

**Text number 5**

The principle of lattice relationships is related to the formation of faults and the age of the periods they intersect. Thus, if it is observed that a fault penetrates some formations but not the formations on top of it, the formations intersected by the fault are older than the fault, and those not intersected by the fault must be younger than the fault. Finding the key layer in these situations can help determine whether the fracture is a normal or a shear fracture.

**Question 0**

What is the principle behind the formation of defects and the age of the sections they intersect?

**Question 1**

When there are uncut rock formations on the top of the carcass, do they have to be older or younger than the carcass?

**Question 2**

Finding What helps you determine whether the fault is a normal or a push fault?

**Question 3**

Are the cut stones on top of the bruise always older or younger than the bruise itself?

**Question 4**

What principle helps you to find the difference between a normal and a pushing fault?

**Question 5**

What are key beds for younger people?

**Question 6**

What do you need to find to find out if the stones are connected?

**Question 7**

What is the age of the key beds if they are related to a fault and not cut?

**Question 8**

How does cutting the keystone help the older stone form?

**Question 9**

What is a key bed?

**Question 10**

Which principle helps to define the key pedal?

**Question 11**

Why are the cut stones on the bruise younger than the bruise?

**Question 12**

What is a misalignment?

**Question 13**

What can you say about a fault that penetrates the upper rocks but not the lower formations?

**Text number 6**

According to the principle of inclusions and components, for sedimentary rocks, if inclusions (or clasts) occur in a formation, the inclusions must be older than the formation containing them. For example, in sedimentary rocks, it is common for gravel from an older formation to rupture and be incorporated into a newer layer. The same is true for igneous rocks where xenoliths are present. These foreign bodies are picked up by magma or lava flows, incorporated and subsequently cool in the matrix. As a result, the xenoliths are older than the rock that contains them.

**Question 0**

What kind of foreign bodies older than the rocks are found in magma rocks that are older than the rocks themselves?

**Question 1**

What collects xenoliths and settles in a matrix of magmatic rocks?

**Question 2**

What is another word for inclusions in sedimentary rocks?

**Question 3**

What is the principle that sedimentary rock inclusions must be older than the formation that contains them?

**Question 4**

What is something that often ruptures and is contained in sedimentary rock?

**Question 5**

What do the matrix components tell us about how magma flows?

**Question 6**

Where does the gravel in xenoliths come from?

**Question 7**

What happens to the gravel in xenoliths?

**Question 8**

What is another word for xenoliths?

**Question 9**

How old is the lava flow after it has cooled down?

**Question 10**

Why is gravel used in magmatic rocks?

**Question 11**

What are xenoliths made of?

**Question 12**

What says that formations must be older than the inclusions within them?

**Question 13**

What is a matrix?

**Question 14**

What is another name for the formation?

**Text number 7**

The principle of the inheritance of animal species is based on the presence of fossils in sedimentary rocks. Since organisms occur all over the world at the same time, their presence or (sometimes) absence can be used to determine the relative age of the formations in which they occur. The principles are based on those developed by William Smith almost a century before Charles Darwin's theory of evolution was published, and the principles of succession were developed independently of evolutionary thought. However, the principle becomes quite complex when one takes into account the uncertainties associated with fossilisation, the localisation of fossil types due to lateral changes in habitat (facies changes in sedimentary strata) and the fact that not all fossils may be found at the same time worldwide.

**Question 0**

What is the principle behind the presence of fossils in sedimentary rocks?

**Question 1**

On whose principles was the principle of animal succession built?

**Question 2**

The fact that not all fossils may be found globally at the same time means that the principle becomes what?

**Question 3**

What is the presence or absence of which can be used to determine the relative age of the formations in which they occur?

**Question 4**

The principle of animal succession was developed 100 years before whose theory of evolution?

**Question 5**

Where can sedimentary rocks not occur at the same time?

**Question 6**

What is the theory of evolution based on?

**Question 7**

What habitat changes can be used to gain information about formation?

**Question 8**

How much after Charles Darwin did William Smith develop the principles of heredity?

**Question 9**

What is one uncertainty about evolutionary theory that makes it complex?

**Question 10**

When was Charles Darwin's theory of evolution published?

**Question 11**

Who wrote the Principles of Faunal Succession?

**Question 12**

Why is evolutionary theory so complicated?

**Question 13**

Why is the absence of an organism an easy way to show the age of a formation?

**Question 14**

What is the idea behind the principles of succession?

**Text number 8**

In the early 20th century, the ability to obtain precise absolute dates for geological events using radioactive isotopes and other methods contributed to significant advances in geological science. This changed the concept of geological time. Previously, geologists could only use fossils and stratigraphic correlation to date rock units in relation to each other. Isotopic data allowed absolute ages to be assigned to rock units, and these absolute dates could be applied to fossil sequences with datable material, converting old relative ages into new absolute ages.

**Question 0**

When was the possibility of using radioactive isotopes to date rock formations developed?

**Question 1**

What kind of correlation was used in the past to date rock formations?

**Question 2**

Today, it is possible to convert old relative ages into what kind of ages using isotope data?

**Question 3**

Before isotopic dating, rock fragments had to be dated using fossils and stratigraphic correlation with respect to what?

**Question 4**

When dating rocks, where does absolute isotopic time apply?

**Question 5**

How did the development of fossil use help geological science in the early 20th century?

**Question 6**

What did the use of fossils help to change scientists?

**Question 7**

When was the ability to use fossils to date isotopic formations developed?

**Question 8**

What is now possible to do when isotopes are timed using fossils?

**Question 9**

Where can scientists apply relative rock sections to find isotopes?

**Question 10**

When did geologists stop using isotopes?

**Question 11**

When did geologists start comparing fossils?

**Question 12**

What did stratigraphic correlation replace?

**Question 13**

Absolute ages had to be converted to what?

**Question 14**

What are fossil sequences applied to?

**Text number 9**

In many geological applications, isotopic ratios of radioactive elements in minerals are measured, which indicate how much time has elapsed since the rock passed a certain confinement temperature, the point at which different radiometric isotopes stop diffusing into and out of the crystalline reservoir. These are used in geochronological and thermochronological studies. Common methods include uranium-lead, potassium-argon, argon-argon and uranium-thorium dating. These methods are used for a wide range of applications. Dating of lava and volcanic ash layers within the stratigraphic sequence can provide absolute age information for sedimentary rocks that do not contain radioactive isotopes and calibrate relative dating methods. These methods can also be used to determine the date of origin of plutons. Thermochemical methods can be used to determine crustal temperature profiles, mountain uplift and paleotopography.

**Question 0**

What techniques can be used to determine paleotopography?

**Question 1**

What is called the point at which different radiometric isotopes stop diffusing into and out of the crystal lattice?

**Question 2**

What kind of ratios are used in geochronological and thermochronological studies?

**Question 3**

How can the absolute age of sedimentary rocks that do not contain radioactive isotopes be determined?

**Question 4**

What is used to measure crystalline lattices?

**Question 5**

What is the one thing that measuring the crystal boxes shows in the ash layers?

**Question 6**

What is one thing that can be used to determine the ash layers in a crystal grid?

**Question 7**

What does the positioning of plutons give after the stratigraphic sequence has been measured in minerals?

**Question 8**

Which studies use pluton placement?

**Question 9**

What is a crystalline structure made of?

**Question 10**

What does palaeotopography study?

**Question 11**

What is the point at which radiometric isotopes start to diffuse?

**Question 12**

What cannot be used to determine the date of birth of plutons?

**Question 13**

What determines the temperature profile outside the envelope?

**Text number 10**

When rock units are subjected to horizontal compression, they become shorter and thicker. Since the volume of rock units other than mud does not change significantly, this happens mainly in two ways: through fractures and warps. In the shallow crust, where brittle deformation can occur, thrust fractures form, causing the deeper rock to move over the shallower rock. Since the deeper rock is often older, as the overlap principle shows, this can lead to the older rock moving over the younger rock. Movement along fractures can lead to warping, either because the fractures are not flat, or because rock layers are pulled along them to form ripples as sliding occurs along the fracture. Deeper in the Earth, rocks behave plastically and fold instead of fracture. These buckles can either be where the material in the centre of the buckle bends upwards, creating an 'antiform', or where it bends downwards, creating a 'synform'. If the tops of the rock units within the warps point upwards, they are called anticlinal and syncline respectively. If some of the units within the warp point downwards, the structure is called inverted anticlinal or syncline, and if all the rock units are inverted or the correct upward orientation is not known, they are simply referred to by the more general terms antiforms and synforms.

**Question 0**

Rock units become thicker and shorter when subjected to this type of compression.

**Question 1**

Where do impact fractures occur?

**Question 2**

When a rock folds deep inside the earth, it can fold in two ways: when it folds upwards, it creates what?

**Question 3**

When a rock folds deep inside the earth, it can fold in two ways: when it folds downwards, it creates what?

**Question 4**

If the tops of the rock units inside the warps point upwards, they are called what?

**Question 5**

What happens when syncline is compressed horizontally?

**Question 6**

What are two ways in which mud does not change in volume?

**Question 7**

What happens because the younger rock is deeper?

**Question 8**

What happens deeper in the Earth, where brittle deformation is taking place?

**Question 9**

What types of faults occur in the shallow crust?

**Question 10**

What kind of unit tends to change its volume?

**Question 11**

According to what principle are deeper rocks generally younger?

**Question 12**

What kind of behaviour causes rocks deeper in the ground to fracture instead of folding?

**Question 13**

What happens to rock units under vertical pressure?

**Question 14**

Why are downward knots called downward knots in the fault location?

**Text number 11**

The expansion causes the rock units as a whole to lengthen and thin. This occurs primarily through normal fracturing and persistent elongation and thinning. Normal fractures drop higher rock units below lower rock units. This typically results in younger units being placed below older units. Elongation of units can lead to thinning; in fact, in the Maria Fold and Thrust Belt, there is a place where the entire sedimentary sequence of the Grand Canyon is visible for less than a metre. At depths where rocks are persistently stretched, they are often also metamorphosed. These stretched rocks can also compress into lenses, known as boudins (after the French word for sausage) because of their visual similarity.

**Question 0**

This causes the rock unit as a whole to become longer and thinner.

**Question 1**

Stretched stones compressed into a lens are known by what word?

**Question 2**

Where is the entire sedimentary section of the Grand Canyon visible in less than a metre?

**Question 3**

Rocks that are persistently elongated in depth are often also what?

**Question 4**

What causes the rock to expand?

**Question 5**

What is another French word for thinning stones?

**Question 6**

Where can you see the lower cliffs of the Grand Canyon?

**Question 7**

What happens to the sediment layers, which are also thinning?

**Question 8**

What does the extension do to sediment less than a metre long?

**Question 9**

How does sediment make a rock fall?

**Question 10**

What puts younger units above older units?

**Question 11**

How long is the boudin?

**Question 12**

How tall is Maria Fold?

**Question 13**

Where will enlargement take place?

**Question 14**

What was the name of the stretched section of the Grand Canyon?

**Text number 12**

During deformation, new rock units are often created both by layering and intrusively. Cross-cutting and other deformation processes result in topographic gradients, whereby material in the uplifting rock unit erodes into slopes and channels. These sediments are deposited on top of the descending rock unit. Continued movement along the fault maintains a topographic gradient despite sediment movement and continues to create space for material to settle. Deformation events are also often associated with volcanism and volcanic activity. Volcanic ash and lavas accumulate at the surface, and magmatic intrusions come from below. Dikes, long, flat igneous rocks, intrude along fractures and therefore often form in large quantities in areas of active deformation. This can lead to the formation of dike swarms, such as the dike swarms seen in the Canadian Shield or the dike rings around the volcanic lava tube.

**Question 0**

What is another word for long, flat igneous rock intrusions?

**Question 1**

Where do dams form?

**Question 2**

What types of gradients are formed by fractures and other deformation processes?

**Question 3**

Which function maintains topographic gradients?

**Question 4**

What events are often associated with volcanism and igneous activity?

**Question 5**

What are two ways in which lava tubes are inserted during deformation?

**Question 6**

What is the process by which lava tubes expand?

**Question 7**

Which two types of activity are associated with the Canadian Shield?

**Question 8**

What are the movements along the dam banks sustaining?

**Question 9**

What does the constant movement along the dam banks do to sediment deposition?

**Question 10**

What causes erosion of slopes and channels?

**Question 11**

What causes topographic gradients?

**Question 12**

What causes the collapse of topographic gradients?

**Question 13**

What is another name for a deformative event?

**Question 14**

What is another name for a dam?

**Text number 13**

Not all these processes necessarily take place in the same environment and not necessarily in the same order. The Hawaiian Islands, for example, are composed almost entirely of layered basaltic lava flows. The sedimentary sequences of the mid-continent of the United States and the Grand Canyon in the southwestern United States contain nearly deformed sedimentary rock piles that have remained in place since Cambrian times. Other areas are much more geologically complex. In the southwestern United States, sedimentary, igneous and intrusive rocks are metamorphosed, fractured, foliated and twisted. Even older rocks, such as the Acasta gneiss of the Slave Craton in northwestern Canada, the oldest known rock in the world, are so metamorphosed that their origin cannot be discerned without laboratory analysis. Moreover, these processes can occur in stages. In many places, of which the Grand Canyon in the southwestern United States is a very visible example, lower rock units metamorphosed and deformed, after which the deformation ceased and the upper, undeformed units were deposited. Although rock displacement and rock deformation can occur in any number of ways and at any number of times, these concepts provide a guide to understanding the geological history of the area.

**Question 0**

What are the islands of Hawaii made up of almost entirely?

**Question 1**

What is the oldest known stone in the world?

**Question 2**

What kind of rock is in the Grand Canyon?

**Question 3**

When have the cliffs of the Grand Canyon been in place?

**Question 4**

Where is the oldest known rock in the world?

**Question 5**

What is Hawaii made of that has been around since the Cambrian era?

**Question 6**

What has happened to the sedimentary, volcanic and intrusive rocks of the Grand Canyon?

**Question 7**

What has happened to the Grand Canyon rock, the oldest rock in the world?

**Question 8**

What about the origin of the Grand Canyon rock is difficult to determine unless it is analysed in a laboratory?

**Question 9**

In which area of north-western Canada are the sedimentary rock piles nearly deformed?

**Question 10**

What is the youngest rock type that has changed?

**Question 11**

How long have the intrusive rocks of the south-western United States been around?

**Question 12**

What is the Grand Canyon not an example of?

**Question 13**

What's so complicated about the layering of the Hawaiian islands?

**Question 14**

What was formed after the deformable units had been layered?

**Text number 14**

Geologists use a range of field, laboratory and numerical modelling techniques to understand the history of the Earth and the processes that take place on and within it. In typical geological studies, geologists primarily use data related to petrology (the study of rocks), stratigraphy (the study of sedimentary layers) and structural geology (the study of the location of rock units and their deformation). In many cases, geologists also study modern soils, rivers, landscapes and glaciers, investigate the evolution of past and present life and biogeochemical pathways, and use geophysical methods to study the Earth's surface.

**Question 0**

What is petrology?

**Question 1**

What is stratigraphy?

**Question 2**

What is building geology?

**Question 3**

What modern formations do geologists study?

**Question 4**

What do scientists use to determine the movement of rivers?

**Question 5**

What is another word for examining past and present life?

**Question 6**

Which method is used to study the location of glaciers and their sub-surface?

**Question 7**

What sediment layers are used to study?

**Question 8**

What biogeochemical pathways are used to investigate?

**Question 9**

How do geologists study extraterrestrial processes?

**Question 10**

What is used in atypical studies?

**Question 11**

What are biogeochemical pathways?

**Question 12**

What do geologists use to explore the surface?

**Question 13**

What ancient features do geologists study?

**Text number 15**

In addition to identifying rocks in the field, petrologists also identify rock samples in the laboratory. The two main methods for identifying rocks in the laboratory are the optical microscope and the electron microprobe. In optical mineralogical analysis, thin sections of rock samples are analysed using a petrographic microscope, where minerals can be identified by their different properties in plane-polarised and cross-polarised light, including their double-break, pleochroism, double-bonding and interference properties on a cone lens. Electron microscopy analyses individual sites based on their precise chemical composition and compositional variations within individual crystals. Studies of stable and radioactive isotopes provide information on the geochemical evolution of rock units.

**Question 0**

What do petrologists use electron microprobes for in the laboratory?

**Question 1**

What features do petrologists analyse with a conoscopic lens?

**Question 2**

What do studies of stable and radioactive isotopes reveal?

**Question 3**

Petrologists identify rock samples in the field and where else?

**Question 4**

What kind of microscope do petrologists use?

**Question 5**

How do petrologists identify cross-polarised light?

**Question 6**

What are the two methods for detecting plane-polarised light in the laboratory?

**Question 7**

What equipment is used to identify individual crystals?

**Question 8**

What are the properties of crystals?

**Question 9**

What is used to examine the properties of crystals?

**Question 10**

What do studies on unstable isotopes show?

**Question 11**

What does an optical microscope detect in individual spots?

**Question 12**

What types of stone samples are analysed by electron microprobe?

**Question 13**

What methods do petrologists use to study rocks in the field?

**Question 14**

What lens is used to identify chemical composition?

**Text number 16**

Petrologists can also use data on fluid inclusions and conduct physical experiments at high temperatures and pressures to understand the temperatures and pressures at which different mineral phases are formed and how they change during igneous and metamorphic processes. This research can be extrapolated to the field to understand metamorphic processes and the crystallization conditions of igneous rocks. This work can also help explain processes within the Earth, such as subduction and magma chamber evolution.

**Question 0**

How else can petrologists understand the pressures under which different mineral phases are formed?

**Question 1**

How else can petrologists understand the temperature at which different mineral phases are formed?

**Question 2**

Data from physical experiments can be extrapolated to the field to understand what processes?

**Question 3**

What do petrologists use to understand magma crystallisation?

**Question 4**

What experiments are used to understand how magma flows?

**Question 5**

How does the magma flow change?

**Question 6**

What else can magma flows help us understand?

**Question 7**

What experiments can be used to explain magma crystallisation?

**Question 8**

What does magma chamber evolution explain?

**Question 9**

What processes take place above ground?

**Question 10**

How do the physical experiments explain the fluid inclusion data?

**Question 11**

Research on metamorphic processes helps explain what about pressure?

**Text number 17**

Structural geologists use microscopic analysis of oriented thin sections of geological samples to detect the tissue inside rocks, which provides information about the stresses in the rock's crystal structure. They also plot and combine measurements of geological structures to better understand the orientation of fractures and faults and to reconstruct the history of rock deformation in the region. They also perform analog and numerical experiments on rock deformation in large and small environments.

**Question 0**

Which geologists provide information on the stresses in the crystalline structure of rocks?

**Question 1**

How do structural geologists observe the internal structure of rocks?

**Question 2**

What do structural geologists do with measurements of geological structures to better understand the trends of faults and warps?

**Question 3**

What kind of experiments on rock deformation do structural geologists carry out?

**Question 4**

In what situation do structural geologists reconstruct the crystal structure of rocks?

**Question 5**

What tests are used to reconstruct aggregate?

**Question 6**

Why do geologists draw crystals with a microscope?

**Question 7**

What information does the history of stone deformation provide about crystal structure?

**Question 8**

What do construction geologists do with crystalline fabric measurements?

**Question 9**

What does the trend in thin sections tell geologists?

**Question 10**

How do geologists identify geological structure measurements?

**Question 11**

What does rock deformation tell geologists?

**Question 12**

What test can be done with large settings that cannot be done with small settings?

**Question 13**

What equipment is used to perform analogue and numerical tests?

**Text number 18**

The most famous experiments in structural geology are the orogenic wedges, which are zones where mountains are built on the boundaries of convergent tectonic plates. In analogous versions of these experiments, horizontal sand layers are dragged along the lower surface to a back stop, creating realistic-looking fracture patterns and a critically tapered (all angles remain the same) orogenic wedge. Numerical models work in the same way as these analogous models, although they are often more sophisticated and may include mountain-zone erosion and uplift models. This helps to show the relationship between erosion and mountain form. These studies can also provide useful information on the pathways of metamorphism through pressure, temperature, space and time.

**Question 0**

What are the zones where mountains are built on the boundaries of convergent tectonic plates?

**Question 1**

What are the most famous experiments in structural geology?

**Question 2**

Which horizontal layers are drawn along the surface of the backstop in the analogous versions of the orogenic wedge experiments?

**Question 3**

What does critically tapering mean?

**Question 4**

Which is more advanced, the numerical model or the analogue model of orogenic wedges?

**Question 5**

With what do orogenic wedges work in the same way?

**Question 6**

What are the analogue models often considered to be compared to orogenic wedges?

**Question 7**

What do analogue models include for the process of metamorphosis?

**Question 8**

How do studies provide information about the boundaries of continental plates?

**Question 9**

What are some of the best-known experiments on failure modes?

**Question 10**

Where are the sand layers pulled out from?

**Question 11**

How do analogue models differ from numerical models?

**Question 12**

What are horizontal sand layers called?

**Question 13**

What do studies on metamorphism under pressure help to clarify?

**Question 14**

What is there in the analogue model that is not in the numerical model?

**Text number 19**

In the laboratory, stratigraphers analyse samples of stratigraphic components that can be recovered from the field, for example from drill cores. Stratigraphers also analyse data from geophysical surveys showing the location of stratigraphic units below the surface. Geophysical data and borehole logs can be combined to give a better picture of the subsurface, and stratigraphers often use computer software to do this in three dimensions. Stratigraphers can then use this information to reconstruct ancient processes on the Earth's surface, interpret past environments and locate extraction sites for water, coal and hydrocarbons.

**Question 0**

Who analyses stratigraphic sequences such as cores?

**Question 1**

What types of studies show the location of stratigraphic units in the underground layer?

**Question 2**

What can be combined with geophysical data to get a better picture of the surface?

**Question 3**

What tool do stratigraphers use to see their data in three dimensions?

**Question 4**

Stratigraphers are trying to locate areas for what kind of extraction?

**Question 5**

What do computers analyse in the laboratory?

**Question 6**

What is an example of what computers analyse in a laboratory?

**Question 7**

What do the cores tell you about the location of the water?

**Question 8**

What can the combination of drill cores and ancient processes show?

**Question 9**

What do computers use coal to rebuild?

**Question 10**

What is taken from the laboratory to the field?

**Question 11**

What indicates the location of the drill bits?

**Question 12**

Which computer program allows stratigraphers to view the earth's surface in three dimensions?

**Question 13**

What is the well log data?

**Question 14**

What are ancient processes used for?

**Text number 20**

In the laboratory, biostratigraphers analyse rock samples and cores to find the fossils they contain. These fossils help scientists date the core and understand the stratigraphic environment in which the rock units were formed. Geochronologists accurately date rocks within a stratigraphic sequence to provide more precise absolute limits on the timing and rate of deposition. Magnetic stratigraphers look for signs of magnetic reversals in magnetic rock units in drill cores. Other researchers conduct stable isotope studies of rocks to learn about past climates.

**Question 0**

Who analyses the stone samples taken from the cores in the laboratory?

**Question 1**

Who accurately dates the stones within a stratigraphic sequence?

**Question 2**

Why is it important to date rocks accurately within a stratigraphic sequence?

**Question 3**

Which researchers are looking for signs of magnetic reversal phenomena in magnetic rocks in cores?

**Question 4**

What do geochronologists analyse from the fossils of drill cores?

**Question 5**

What do the revelation samples help to date the magnetic stratigraphy?

**Question 6**

What do biostratigraphers want to understand about past climates?

**Question 7**

What exactly do magnetic direct writers time?

**Question 8**

What do geochronologists look for in cores?

**Question 9**

What do we find in fossils?

**Question 10**

What helps scientists date fossils?

**Question 11**

What do magnetic stratigraphers study with isotopes?

**Question 12**

Where is the stratigraphic sequence?

**Question 13**

What kind of research do geochronologists do?

**Text number 21**

Some modern scholars, such as Fielding H. Garrison, believe that the origins of geological science can be traced back to Persia after the Muslim conquests ended. Abu al-Rayhan al-Biruni (973-1048 AD) was one of the earliest Persian geologists, whose works include the earliest writings on the geology of India, in which he hypothesised that the Indian peninsula was once a sea. The Persian scholar Ibn Sina (Avicenna, 981-1037), who drew on Greek and Indian scientific literature that was not destroyed by the Muslim conquests, provided detailed explanations of mountain formation, the origin of earthquakes and other topics central to modern geology that laid the essential foundations for the later development of science. In China, the polymath Shen Kuo (1031-1095) formulated a hypothesis about the process of land formation: on the basis of his observations of fossil animal shells in a geological layer in a mountain range hundreds of kilometres from the sea, he concluded that the land had been formed by mountain erosion and silt deposition.

**Question 0**

Fielding H. Garrison believes that the science of geology originated from where?

**Question 1**

He lived between 973 and 1048 AD and was one of the earliest Persian geologists, what was his name?

**Question 2**

In China, this person concluded that the land was formed by the erosion of mountains and the deposition of silt, what was his name?

**Question 3**

What was the name of the person who proposed explanations for the origin of earthquakes and the formation of mountains?

**Question 4**

What made Shen Kuo believe that the land was formed by mountain erosion?

**Question 5**

Where did Ibna Sina believe the science of geology originated?

**Question 6**

One of the earliest writings on India, by Fielding H. Garrison, put forward the hypothesis.

**Question 7**

What literature did Fielding H. Garrison draw from that was not destroyed by the Muslims?

**Question 8**

On what did Ibn Sina, who lived between 1031 and 1095, base his hypothesis about the formation of the earth?

**Question 9**

How did Fielding H. Garrison believe the earth was formed?

**Question 10**

Where is Fielding H. Garrison from?

**Question 11**

What was Shen Kuo's religion?

**Question 12**

When was Greek and Indian literature destroyed by the conquests?

**Question 13**

On what did Abu al-Rayhan al-Biruni base his writings?

**Question 14**

When was Garrison born?

**Text number 22**

James Hutton is often regarded as the first modern geologist. In 1785, he presented a paper to the Royal Society of Edinburgh entitled The Theory of the Earth. In it, he explained his theory that the Earth must be much older than previously thought for the mountains to have eroded and for the sediments to have formed new rocks on the seabed, which in turn rose up and became dry land. Hutton published a two-volume version of his ideas in 1795 (Part 1, Part 2).

**Question 0**

Who is considered the first modern geologist?

**Question 1**

What article did James Hutton present to the Royal Society of Edinburgh in 1785?

**Question 2**

In what year did James Hutton publish a 2-crystal version of his theory?

**Question 3**

What was the main idea behind James Hutton's article?

**Question 4**

When was James Hutton born?

**Question 5**

When was the Edinburgh Royal Society founded?

**Question 6**

What did the Royal Society of Edinburgh present in 1785?

**Question 7**

What was the theory put forward by the Royal Society?

**Question 8**

Why did the Royal Society believe that the Earth is older than previously thought?

**Question 9**

When was James Hutton born?

**Question 10**

When was the Edinburgh Royal Society founded?

**Question 11**

Why did Hutton believe that the Earth had to be much younger than previously thought?

**Question 12**

Who was the first geologist?

**Question 13**

When did Hutton die?

**Text number 23**

William Maclure produced the first geological map of the United States in 1809. In 1807, Maclure began his self-imposed task of making a geological survey of the United States. He traversed and mapped nearly every state in the Union, crossing and recrossing the Allegheny Mountains about 50 times. The results of his self-initiated work were presented in the American Philosophical Society's memoir Observations on the Geology of the United States explanatory of a Geological Map, and were published in the Society's Transactions along with the first geological map of the country. This was six years older than William Smith's geological map of England, although it was drawn up on the basis of a different classification of rocks.

**Question 0**

Who drew the first geological map of the United States?

**Question 1**

What year was the first geological map of the United States produced?

**Question 2**

In what year did William Maclure start creating the first geological map of the United States?

**Question 3**

To whom did William Maclure deliver the map?

**Question 4**

What was the title of the American Philosophical Society's memoir?

**Question 5**

When was the American Philosophical Society founded?

**Question 6**

What did the American Philosophical Society produce in 1809?

**Question 7**

What did William Smith cross about 50 times?

**Question 8**

Which memoir was written by William Smith and published in the Society's Transactions?

**Question 9**

What was William Smith doing in the United States?

**Question 10**

When was the first geological map of the whole Earth created?

**Question 11**

How many times did Maclure cross the Union States?

**Question 12**

Who published William Smith's geological map?

**Question 13**

When was Maclure hired by the American Philosophical Society to do a geological survey?

**Question 14**

How many years later was Maclure's memoir published after the map?

**Text number 24**

Sir Charles Lyell first published his famous Principles of Geology in 1830, a book that influenced the thinking of Charles Darwin and successfully promoted the doctrine of uniformitarianism. According to this theory, slow geological processes have occurred throughout Earth's history and continue to do so. Catastrophism, on the other hand, is the theory that the Earth's features have been formed by single, catastrophic events and have remained unchanged since then. Although Hutton believed in uniformitarianism, the idea was not widely accepted at the time.

**Question 0**

Sir Charles Lyell first published this book in 1830, and what was its title?

**Question 1**

What lessons did the Principles of Geology successfully promote?

**Question 2**

According to which theory do slow geological processes still occur today, and have occurred throughout the history of the Earth?

**Question 3**

According to which theory did the Earth's features remain unchanged after it was formed in a single catastrophic event?

**Question 4**

Which famous evolutionary scientist's work was influenced by the book Principles of Geology?

**Question 5**

What did Charles Darwin publish in 1830?

**Question 6**

What did Charles Darwin successfully contribute?

**Question 7**

What does catastrophism believe is still happening today?

**Question 8**

What did people think about catastrophism in Charles Darwin's time?

**Question 9**

What did Hutton believe was formed in one disaster event?

**Question 10**

Which book did Darwin publish in 1830?

**Question 11**

Which idea of Charles Lyell's was widely accepted at the time of publication?

**Question 12**

When was Sir Charles Lyell born?

**Question 13**

Who influenced Charles Lyell?

**Question 14**

Lyell's book failed to disclose what view?

**Document number 458**

**Text number 0**

The word pharmacy is derived from the root word pharma, which was used in the 1400s and 1700s. However, the original Greek roots pharmakos mean witchcraft or even poison. In addition to its pharmaceutical functions, the pharmacy provided general medical advice and a range of services that today are performed exclusively by other specialists, such as surgery and midwifery. Pharma (as it was called) often operated through a retail shop, which sold tobacco and patent medicines in addition to pharmaceutical ingredients. Often this place was called an apothecary, and in several languages this is the prevailing term, although their practices more closely resemble the modern apothecary, in English the term apothecary would now be considered obsolete or only appropriate if a wide range of herbal medicines were available. Apothecaries also used many other herbs that are not listed. The Greek word pharmakeia (Greek φαρμακεία) comes from pharmakon (φάρμακον), meaning "medicine", "medicine" (or "poison")[n 1].

**Question 0**

Where does the word pharmacy come from?

**Question 1**

What goods were sold in the pharmacy?

**Question 2**

What does the Greek root pharmakos mean?

**Question 3**

How would modern speakers of English feel about the word apothecary?

**Question 4**

What else did pharmacists use?

**Question 5**

What medicine didn't sell?

**Question 6**

What does the English root pharmakos mean?

**Question 7**

What else did pharmacists avoid?

**Question 8**

In which century was the term pharma last used?

**Text number 1**

Pharmacists are healthcare professionals with specialised training who work in different roles to ensure optimal health for patients through the quality use of medicines. Pharmacists can also be small entrepreneurs who own the pharmacy where they work. As pharmacists have detailed knowledge of the mode of action, metabolism and physiological effects of a particular drug on the human body, they play an important role in optimising an individual's drug therapy.

**Question 0**

What kind of professionals are pharmacists?

**Question 1**

What kind of health outcomes are pharmacists seeking with their patients?

**Question 2**

In what kind of care are pharmacists important?

**Question 3**

What other jobs do many pharmacists do?

**Question 4**

What kind of products do pharmacists have?

**Question 5**

What kind of professionals do pharmacists lack?

**Question 6**

What kind of health outcomes do pharmacists never get with their patients?

**Question 7**

What other role do many pharmacists avoid?

**Question 8**

Which preparations are not required by pharmacists?

**Question 9**

For what kind of care are pharmacists not needed?

**Text number 2**

In the UK, a pharmacy technician is considered a healthcare professional and often does not work under the direct supervision of a pharmacist (if working in a hospital pharmacy), but is supervised and mentored by other senior pharmacy technicians. In the UK, the role of the PhT has increased and they have been given responsibility for managing the pharmacy department and pharmacy specialties, allowing pharmacists time to specialise in their own specialty as pharmacy consultants, allowing them to spend more time working with patients and researching. Once qualified, pharmacy technicians must register as professionals with the General Pharmaceutical Council (GPhC). The GPhC is the governing body for pharmacy health professionals, regulating the activities of pharmacists and pharmacy technicians.

**Question 0**

Who supervises a pharmacy technician in the UK?

**Question 1**

Which body must a pharmacy technician register with?

**Question 2**

What is the GPhC's main mission?

**Question 3**

What kind of professional is a pharmacy technician?

**Question 4**

What kind of tasks can a pharmacy technician have?

**Question 5**

Who is not required to supervise a pharmacy technician in the UK?

**Question 6**

Which body is a pharmacy not allowed to register with?

**Question 7**

What is the secondary duty of the GPhC?

**Question 8**

Which tasks may not necessarily be the responsibility of a pharmacy technician?

**Text number 3**

In ancient Greece, Diocles of Carystus (4th century BC) was one of many men who studied the medicinal properties of plants. He wrote several treatises on the subject. The Greek physician Pedanius Dioskorides is famous for writing a five-volume work in his native Greek, Περί ύλης lääketieteικής, in the 1st century AD. The Latin translation of De Materia Medica (Of Medical Materia) was used as the basis for many medieval texts, and many Middle Eastern scholars used it as a basis during the Islamic Golden Age. The title coined the term materia medica.

**Question 0**

Who was the man who researched herbal medicine seekers in ancient Greece?

**Question 1**

What is Pedanius Dioscorides known as?

**Question 2**

What is the name of the Latin translation of the Book of Dioscorides?

**Question 3**

What term was coined from the book of Dioscorides?

**Question 4**

Who added the book of Dioscorides in the golden age of Islam?

**Question 5**

Who is the man studying plant medicine candidates in modern Greece?

**Question 6**

What is Pedanius Dioscorides not known for?

**Question 7**

What is the title of the German translation of Dioscorides' book?

**Question 8**

Who was removed from the Book of Dioscorides in the golden age of Islam?

**Question 9**

Who was the only person to study the medicinal properties of plants in ancient Greece?

**Text number 4**

In Japan, at the end of the Asuka period (538-710) and the beginning of the Nara period (710-794), men who performed tasks similar to those of modern pharmacists were highly respected. The role of pharmacists in society was explicitly defined in the Taihō Code (701) and reaffirmed in the Yōrō Code (718). The imperial court had established positions before the beginning of the Heian period, and this organizational structure remained largely unchanged until the Meiji Restoration (1868). Within this very stable hierarchy, pharmacists - and even pharmacist assistants - were given a status higher than that of any other health-related professions, such as physicians and acupuncturists. In the imperial household, the pharmacist was even above the emperor's two personal physicians.

**Question 0**

What was the perception of men performing tasks similar to those of today's pharmacists in Asuka and Nara-era Japan?

**Question 1**

Which two codes codified the role of pharmacists?

**Question 2**

Why was the hierarchical structure introduced?

**Question 3**

What was the role of pharmacists at the imperial court before the time of Heia?

**Question 4**

Where was the pharmacist in relation to the emperor's personal physicians?

**Question 5**

What removed the hierarchical structure?

**Question 6**

Which two codes were the roles of pharmacists destroyed?

**Question 7**

Where was the pharmacist in relation to the emperor?

**Question 8**

What role was not respected in the Asuka era?

**Text number 5**

In the Middle East, advances in botany and chemistry led to medieval Islamic medicine making significant advances in pharmacology. For example, Muhammad ibn Zakarīya Rāzi (Rhazes) (865-915) promoted the medical use of chemical compounds. Abu al-Qasim al-Zahrawi (Abulcasis) (936-1013) pioneered the manufacture of medicines by sublimation and distillation. His Liber servitoris is of particular interest, as it provides the reader with recipes and explains how to prepare the 'simple medicines' that were used to make the complex medicines that were commonly used at the time. Sabur Ibn Sahl (d. 869), however, was the first physician to begin a pharmacopoeia, in which he described a wide range of medicines and remedies for ailments. Al-Biruni (973-1050) wrote one of the most valuable Islamic works on pharmacology, the Kitab al-Saydalah (Book of Medicine), in which he explained in detail the properties of medicines and outlined the role of pharmacists and the duties and responsibilities of the pharmacist. Avicenna also described as many as 700 preparations, their properties, modes of action and indications. In fact, he devoted an entire volume to simple medicines in The Canon of Medicine. The works of al-Maridin and Ibn al-Wafid (1008-1074), who lived in Baghdad and Cairo, were also highly influential, both of which were printed in Latin more than fifty times: the younger Mesue's De Medicinis universalibus et particularibus and the younger Abenguefit's Medicamentis simplicibus. Peter of Abano (1250-1316) translated and completed al-Maridin's work under the title De Veneris. Al-Muwaffaq's contribution in this field is also pioneering. He lived in the 10th century and wrote The foundations of the true properties of Remedies, in which, among other things, he describes arsenic oxide and introduces silicic acid. He made a clear distinction between sodium carbonate and potassium carbonate and drew attention to the toxicity of copper compounds, especially copper vitriol, and lead compounds. He also describes the distillation of seawater for drinking water.

**Question 0**

Which scientists' developments influenced the creation of pharmacology in medieval Islam?

**Question 1**

Who influenced the promotion of the use of chemical compounds as medicines?

**Question 2**

Who wrote Liber servitoris?

**Question 3**

Which two compounds did Al-Muwaffaq distinguish between?

**Question 4**

Who wrote about distilling drinking water from seawater?

**Question 5**

Who had no influence on promoting the use of chemical compounds as medicines?

**Question 6**

Who could not read the Liber servitoris letter?

**Question 7**

Who wrote about distilling seawater from drinking water?

**Question 8**

Which two compounds did Al-Muwaffaq combine?

**Question 9**

Which scientists avoided creating pharmacology in modern Islam?

**Text number 6**

There are still old pharmacies in Europe in Dubrovnik, Croatia, located inside a Franciscan monastery and opened in 1317, and in Tallinn's Town Hall Square, Estonia, dating back to at least 1422. The oldest is said to have been founded in 1221 in the church of Santa Maria Novella in Florence, Italy, which now houses a perfume museum. The medieval Esteve pharmacy, located in Llívia, a Catalan enclave near Puigcerdà, which is now also a museum, dates back to the 15th century and houses albarelles, old prescription books and antique medicines from the 16th and 17th centuries.

**Question 0**

How far back does one Croatian pharmacy go?

**Question 1**

Where is the oldest pharmacy located?

**Question 2**

What is the medieval Esteve pharmacy used for today?

**Question 3**

What kind of objects are on display at the Esteve Pharmacy Museum?

**Question 4**

In what year is the oldest pharmacy said to have been founded?

**Question 5**

Where is the latest pharmacy reported to be located?

**Question 6**

In what year is the oldest pharmacy said to have disappeared?

**Question 7**

What is the medieval Esteve pharmacy that is no longer used today?

**Question 8**

Which objects are never on display at the Esteve Pharmacy Museum?

**Text number 7**

In most countries, pharmacies are subject to pharmacy legislation, which includes requirements for storage conditions, mandatory texts, equipment, etc., which are specified in the legislation. Whereas pharmacy staff used to stay in the pharmacy to mix and dispense medicines, trained pharmaceutical assistants are increasingly being used, while pharmacy staff spend more time talking to patients. Pharmacy technicians are now increasingly reliant on automation to help them in their new role of dealing with patient prescriptions and patient safety issues.

**Question 0**

What applies to pharmacies in most countries?

**Question 1**

What were the tasks to which pharmacy technicians were previously restricted?

**Question 2**

What are pharmacy technicians increasingly dependent on?

**Question 3**

What new responsibilities do pharmacy technicians now have?

**Question 4**

What does pharmacy legislation say?

**Question 5**

What applies to pharmacy in minority countries?

**Question 6**

What are pharmacy technicians less and less dependent on?

**Question 7**

What pharmacy legislation will never prescribe?

**Question 8**

What are the tasks to which pharmacy technicians are limited?

**Question 9**

What duties do pharmacy technicians never perform?

**Text number 8**

Because of the complexities of medicines, including specific indications, the effectiveness of treatment regimens, drug safety (i.e. drug interactions) and patient compliance issues (in hospital and at home), many pharmacists working in hospitals acquire additional training after pharmacy school through a specialisation period in pharmacy practice, sometimes followed by a second specialisation period in a particular field. These pharmacists are often called clinical pharmacists and often specialise in different areas of pharmacy. For example, there are pharmacists who specialise in haematology/oncology, HIV/AIDS, infectious diseases, critical care, emergency medicine, toxicology, nuclear pharmacy, pain management, psychiatry, anticoagulation, herbal medicine, neurology/epilepsy, paediatrics, neonatal pharmacology and other areas.

**Question 0**

Where do pharmacists gain additional skills after pharmacy school?

**Question 1**

What do clinical pharmacists specialise in?

**Question 2**

What is the one thing that makes a pharmacist's job more complex?

**Question 3**

Which pharmacists are likely to seek further training after pharmacy school?

**Question 4**

Where do pharmacists not go after pharmacy school?

**Question 5**

What are clinical pharmacists not specialised in?

**Question 6**

What is the one thing that takes the complexity out of a pharmacist's job?

**Question 7**

Which pharmacists never seek further training after pharmacy school?

**Text number 9**

Hospital pharmacies are often located on hospital premises. Hospital pharmacies usually have a wider range of medicines, including specialised medicines, than would be available in the community. Most hospital medicines are single doses. Hospital pharmacists and trained pharmaceutical technicians prepare sterile products for patients, including total parenteral nutrition (TPN) and other intravenous medicines. This is a complex process that requires adequate staff training, product quality assurance and appropriate facilities. Several hospital pharmacies have chosen to outsource risk formulations and some other compounding activities to companies specialising in compounding. The high cost of medicines and medicines-related technology, and the potential impact of medicines and pharmacy services on patient outcomes and patient safety, make it essential for hospital pharmacies to operate at the highest possible level.

**Question 0**

Where are many hospital pharmacies located?

**Question 1**

What form do most hospital medicines take?

**Question 2**

What kind of pharmacy activities have been outsourced?

**Question 3**

What is one factor that adds to the importance of high performance in pharmacy?

**Question 4**

What are the advantages of hospital pharmacies?

**Question 5**

Where are there no hospital pharmacies?

**Question 6**

What form should most hospital medicines not take?

**Question 7**

Which pharmacy functions have never been outsourced?

**Question 8**

What is one factor that reduces the importance of high performance in pharmacy?

**Question 9**

What are the disadvantages of hospital pharmacies?

**Text number 10**

Pharmacists provide direct patient care services to optimise the use of medicines and promote health, well-being and disease prevention. Clinical pharmacists treat patients in all healthcare settings, but the clinical pharmacy movement originally began in hospitals and clinics. Clinical pharmacists often collaborate with physicians and other healthcare professionals to improve medication management. Today, clinical pharmacists are an integral part of a multidisciplinary approach to patient care. They are often involved in the selection of medicines for patient care rotations.

**Question 0**

What do pharmacists offer?

**Question 1**

What is the origin of clinical pharmacy?

**Question 2**

Who do clinical pharmacists work with most of the time?

**Question 3**

What are clinical pharmacists often involved in?

**Question 4**

Where do clinical pharmacists work with patients?

**Question 5**

What is not the origin of clinical pharmacy?

**Question 6**

Who do clinical pharmacists never work with?

**Question 7**

What are clinical pharmacists not involved in?

**Question 8**

Where are clinical pharmacists not allowed to work with patients?

**Text number 11**

The clinical pharmacist's duties include developing a comprehensive drug treatment plan for patient-specific problems, setting treatment goals and reviewing all prescribed medicines before dispensing and administering them to the patient. The review process often includes assessing the appropriateness (e.g. choice of drug, dose, dosage, route of administration, frequency and duration of treatment) and efficacy of drug therapy. The pharmacist must also monitor for potential drug interactions and side effects, and assess the patient's drug allergies when developing and initiating the drug treatment plan.

**Question 0**

What is an example of a clinical pharmacist's role?

**Question 1**

What is involved in reviewing prescribed medicines?

**Question 2**

What are the components of medical treatment?

**Question 3**

What other factors should the pharmacist monitor?

**Question 4**

What is not an example of a clinical pharmacist?

**Question 5**

What is never involved in reviewing prescribed medicines?

**Question 6**

What are no longer part of medical treatment?

**Question 7**

What other factors cannot be controlled by the pharmacist?

**Text number 12**

In the US federal health care system (including the VA, Indian Health Service and NIH), pharmacists in ambulatory care have full independent prescribing authority. In some states, such as North Carolina and New Mexico, these clinical pharmacists have been given collaborative prescribing and diagnostic authority. In 2011, the Board of Pharmacy Specialties approved outpatient pharmacy practice as a separate board certification. Pharmacists who have passed the Board Certification in Ambulatory Care Pharmacy are officially designated as Board Certified Ambulatory Care Pharmacists, and these pharmacists bear the initials BCACP.

**Question 0**

What powers do outpatient pharmacists have in the US federal health care system?

**Question 1**

In which states do pharmacy clinics have prescribing and diagnostic powers?

**Question 2**

When was outpatient pharmacy accepted as a separate certification?

**Question 3**

What is the name of a pharmacist who has completed an ambulatory care pharmacist qualification?

**Question 4**

Which entities are part of the federal health care system?

**Question 5**

What powers are not given to outpatient pharmacists in the US federal health care system?

**Question 6**

In which states do pharmacy clinics not have prescribing and diagnostic powers?

**Question 7**

When was an outpatient pharmacy rejected as a separate certificate?

**Question 8**

Which entities are not part of the federal health care system?

**Question 9**

What is the name of the pharmacist if he or she does not pass the pharmacist's ambulance exam?

**Text number 13**

Consultant pharmacy practice focuses more on reviewing medication regimens (i.e. "cognitive services") than on the actual dispensing of medicines. Consultant pharmacists typically work in nursing homes, but increasingly they are also working in other institutional and non-institutional settings. Traditionally, consultant pharmacists have tended to be self-employed, but in the US many are now employed by several large pharmacy management companies (mainly Omnicare, Kindred Healthcare and PharMerica). This trend may be gradually reversing as consultant pharmacists begin to work directly with patients, mainly because many elderly people now use many medicines but continue to live outside institutional settings. Some community pharmacies employ consultant pharmacists and/or provide consultancy services.

**Question 0**

What does a consultant pharmacy mainly do?

**Question 1**

Where do most consultant pharmacists work?

**Question 2**

What are the big pharmacy management companies?

**Question 3**

What is the main reason why consultant pharmacists are increasingly working directly with patients?

**Question 4**

What do some community pharmacies do?

**Question 5**

What is the consultant pharmacist not worried about?

**Question 6**

Where do a minority of consultant pharmacists work?

**Question 7**

What are small pharmacy management companies?

**Question 8**

What is a secondary reason why consultant pharmacists are increasingly working directly with patients?

**Question 9**

What do community pharmacies not do?

**Text number 14**

Since around 2000, Internet pharmacies have been increasingly established worldwide. Many of these pharmacies resemble community pharmacies, and in fact many of them are actually community pharmacies run by cornerstone pharmacies that serve consumers both online and door-to-door. The main difference is the method by which medicines are requested and received. Some customers find this method more convenient and private than travelling to a community pharmacy, where another customer may overhear about the medicines they are taking. Internet pharmacies (also called online pharmacies) are also recommended by doctors for some patients if they are at home.

**Question 0**

When did online pharmacies start to emerge?

**Question 1**

Who often acts as the administrator of online pharmacies?

**Question 2**

What are online pharmacies known as?

**Question 3**

What is one reason why a patient might choose an online pharmacy?

**Question 4**

What is the main difference between online pharmacies and pharmacies?

**Question 5**

When did online pharmacies start to run out?

**Question 6**

Who cannot use internet pharmacies?

**Question 7**

Why are online pharmacies never called?

**Question 8**

What is not a reason for a patient to choose an online pharmacy?

**Question 9**

What is the difference between online and community pharmacies?

**Text number 15**

Most Internet pharmacies sell prescription medicines and require a valid prescription, but some Internet pharmacies sell prescription medicines without a prescription. Many customers order medicines from such pharmacies to avoid the "hassle" of a doctor's visit or to obtain medicines that their doctors have refused to prescribe. However, this practice has been criticised as potentially dangerous, particularly by those who believe that only doctors can reliably assess contraindications, risk-benefit ratios and the overall suitability of an individual for taking a medicine. It has also been reported that such pharmacies have dispensed poor quality products.

**Question 0**

Why might customers order from online pharmacies?

**Question 1**

Who has criticised ordering from online pharmacies that do not require prescriptions?

**Question 2**

What criticisms are there of online pharmacies that dispense medicines without a prescription?

**Question 3**

What are the practices of some internet pharmacies?

**Question 4**

What do most online pharmacies do?

**Question 5**

Why might customers not order from online pharmacies?

**Question 6**

What do online pharmacies not allow?

**Question 7**

What is the requirement for online pharmacies that dispense medicines without a prescription?

**Question 8**

What practice do all online pharmacies avoid?

**Text number 16**

A particular concern with internet pharmacies is that people, particularly young people, can easily obtain controlled substances (e.g. Vicodin, commonly known as hydrocodone) over the internet without a prescription from a doctor or practitioner with an established doctor-patient relationship. There are many cases where a doctor gives a prescription for a controlled substance, transmitted by an Internet server, to a "patient" whom he has never met. In the US, a prescription for a controlled substance must be legal and must be issued by a licensed physician in a legal doctor-patient relationship for a legal medical purpose in order for the prescription to be valid. The dispensing pharmacist has a corresponding responsibility to ensure that the prescription is valid. Often, individual state laws define what constitutes a valid patient-physician relationship.

**Question 0**

What conditions must be met for a prescription for a controlled substance to be valid?

**Question 1**

What is one of the problems with internet pharmacies?

**Question 2**

What conditions must be met before a controlled substance can be prescribed?

**Question 3**

What is the pharmacy's obligation to fill the prescription?

**Question 4**

Who defines what a patient-doctor relationship is?

**Question 5**

What is an example of a controlled substance?

**Question 6**

What is not the problem with online pharmacies?

**Question 7**

Who does not define what a patient-physician relationship is?

**Question 8**

What is not an example of a controlled substance?

**Question 9**

What conditions for prescribing a controlled substance cannot be met?

**Question 10**

What is not the responsibility of the pharmacy filling the prescription?

**Text number 17**

In the United States, efforts have been made to legalise the import of medicines from Canada and other countries to reduce costs for consumers. Although the importation of prescription drugs in most cases violates Food and Drug Administration (FDA) regulations and federal laws, enforcement is generally directed at international drug suppliers rather than consumers. There is no known case in which authorities have ever prosecuted a US citizen who purchased Canadian medicines for personal use with a prescription.

**Question 0**

What is the reason for requiring the legalisation of imports of medicines from other countries?

**Question 1**

Which country is proposed for the import of medicines?

**Question 2**

Who are the FDA's drug import laws for?

**Question 3**

Has anyone ever been charged with importing medicines from Canada for personal use?

**Question 4**

What is the US doing to reduce the cost of medicines for consumers?

**Question 5**

What is the reason for wanting to make the import of medicines from other countries illegal?

**Question 6**

Which country cannot be proposed for the importation of medicines?

**Question 7**

Who are the FDA's drug import laws not aimed at?

**Question 8**

Why is the US not working to lower the cost of medicines for consumers?

**Text number 18**

Pharmacy informatics is a combination of the science of pharmacy practice and applied informatics. Pharmacy informaticians work in many areas of pharmacy practice, but they may also work in IT departments or for healthcare IT vendors. Pharmacy informatics is growing rapidly as a practice and specialty to meet the needs of major national and international patient information projects and healthcare systems interoperability goals. Pharmacists in this field are being trained to contribute to the development, implementation and optimisation of pharmaceutical management systems.

**Question 0**

What two things does pharmacy IT have in common?

**Question 1**

In which areas can pharmacy informatics work?

**Question 2**

Whose needs does the growth of pharmacy informatics meet?

**Question 3**

In which areas are pharmacy IT professionals willing to work?

**Question 4**

How fast is pharmacy IT growing?

**Question 5**

What two things cannot be combined by pharmacy informatics?

**Question 6**

In which areas might pharmacy IT not work?

**Question 7**

Whose needs are being harmed by the growth of pharmacy IT?

**Question 8**

In which areas are pharmacy IT specialists not prepared to work?

**Text number 19**

Specialist pharmacies supply expensive injectable, oral, infused or inhaled medicines used to treat chronic and complex diseases such as cancer, hepatitis and rheumatoid arthritis. Unlike a traditional community pharmacy, where prescriptions can be brought in and filled for any ordinary medicine, specialised pharmacies sell a new type of medicine that must be stored, dispensed, carefully monitored and clinically managed. In addition to supplying these medicines, specialty pharmacies also provide laboratory monitoring, medication adherence advice and help patients with cost containment strategies for purchasing expensive specialty medicines. This is currently the fastest growing sector in the pharmaceutical industry, with 19 of the 28 new drugs approved by the FDA in 2013 being specialty drugs.

**Question 0**

What is the fastest growing sector in the pharmaceutical industry?

**Question 1**

How many drugs approved by the FDA in 2013 were specialty drugs?

**Question 2**

For which types of illnesses are specialist medicines often used?

**Question 3**

What kind of medicines do specialised pharmacies stock?

**Question 4**

What else do specialised pharmacies offer besides medicines?

**Question 5**

What is the slowest growing sector in the pharmaceutical industry?

**Question 6**

How many drugs approved by the FDA in 2011 were specialty drugs?

**Question 7**

For which types of diseases are specialised medicines no longer used?

**Question 8**

Which medicines are never stocked by specialised pharmacies?

**Text number 20**

In most jurisdictions (such as the US), pharmacists are regulated separately from doctors. These jurisdictions also generally provide that only pharmacists may supply the public with drugs that are part of a drug plan, and that pharmacists may not form business partnerships with or pay "kickbacks" to physicians. However, the American Medical Association's (AMA) Code of Ethics states that doctors can dispense drugs in their offices, as long as the patient is not abused and the patient has the right to a written prescription that can be filled elsewhere. Between 7% and 10% of American doctors' offices report dispensing medicines themselves.

**Question 0**

How are pharmacists regulated in most jurisdictions?

**Question 1**

Who in most jurisdictions can supply scheduled drugs to the public?

**Question 2**

Which body has ruled that doctors can also dispense medicines under certain conditions?

**Question 3**

What is the estimate of how many doctors dispense medicines themselves?

**Question 4**

What are pharmacists not allowed to do?

**Question 5**

Who in your jurisdiction cannot provide scheduled drugs to the public?

**Question 6**

Which body has ruled that doctors cannot dispense medicines under certain conditions?

**Question 7**

How will pharmacists never be regulated?

**Text number 21**

Some rural areas of the UK have dispensing doctors who are allowed to both prescribe and dispense prescription medicines to their patients in their surgeries. The law requires that the GP practice is located in a designated rural area and that there is a minimum distance (currently 1.6 km) between the patient's home and the nearest retail pharmacy. This law also applies to general practitioners in Austria if the nearest pharmacy is more than 4 km away or if there is no registered pharmacy in the town.

**Question 0**

Where are some doctors allowed to prescribe and administer medicines in their surgery?

**Question 1**

In which other countries can doctors dispense medicines in their surgeries?

**Question 2**

What is the minimum distance between a patient's home and the nearest pharmacy for a doctor to dispense medicines?

**Question 3**

What is the minimum distance between a patient's home and the nearest pharmacy for a doctor to dispense medicines in Austria?

**Question 4**

Where are some doctors not allowed to prescribe and administer medicines in their surgery?

**Question 5**

In which other countries are doctors not allowed to dispense medicines in the doctor's surgery?

**Question 6**

What is the maximum distance between a patient's home and the nearest pharmacy that allows a doctor to dispense medicines?

**Question 7**

What is the maximum distance between a patient's home and the nearest pharmacy that allows a doctor to dispense medicines in Austria?

**Text number 22**

The reason for the majority rule is the high risk of conflicts of interest and/or the avoidance of absolute power. Otherwise, the doctor has a financial interest in "diagnosing" as many diseases as possible and exaggerating their severity, because he can then sell more drugs to the patient. Such self-interest is in direct conflict with the patient's interest in obtaining cost-effective medication and avoiding unnecessary medication that may have side effects. This system is very similar to the system of checks and balances in the United States and many other governments.

**Question 0**

Why is the majority rule used?

**Question 1**

Why can a doctor diagnose a large number of diseases?

**Question 2**

What do the conflict of interest rules for doctors diagnosing patients resemble?

**Question 3**

In which cases can the doctor's own interests conflict with those of the patient?

**Question 4**

How else could a doctor use self-interest?

**Question 5**

Why is the majority rule avoided?

**Question 6**

Why might a doctor never diagnose a large number of diseases?

**Question 7**

What do the conflict of interest rules for doctors diagnosing patients not resemble?

**Question 8**

In which cases can the doctor's self-interest be as important as the patient's?

**Question 9**

How else could a doctor not use his or her own advantage?

**Text number 23**

In the coming decades, pharmacists are expected to play an increasingly central role in the healthcare system. Instead of simply dispensing medicines, pharmacists are increasingly expected to be remunerated for their patient care skills. In particular, Medication Therapy Management (MTM) includes clinical services that pharmacists can provide to their patients. These services include a thorough analysis of all medicines (prescription, OTC and herbal) that a person is currently taking. The result is medication reconciliation and patient education, which improves patients' health and reduces costs to the healthcare system.

**Question 0**

What will be the role of the pharmacist in the coming decades?

**Question 1**

What responsibilities do you expect pharmacists to take on more in the future?

**Question 2**

What does medication management involve?

**Question 3**

What are some examples of clinical services that pharmacists can provide?

**Question 4**

What results are expected from medicines management?

**Question 5**

What is the role of the pharmacist in recent decades?

**Question 6**

Which responsibilities are expected to decrease for pharmacists in the future?

**Question 7**

What is not included in medication management?

**Question 8**

What are not examples of clinical services that pharmacists can provide?

**Question 9**

What results are not expected from medicines management?

**Text number 24**

This change has already begun in some countries; for example, in Australia, pharmacists are reimbursed by the Australian government for conducting comprehensive home medicine assessments. In Canada, in certain provinces, pharmacists have limited prescribing rights (such as Alberta and British Columbia), or are reimbursed by the provincial government for more extensive services such as medication reviews (Medschecks in Ontario). In the UK, pharmacists with additional training receive prescribing rights, and this is due to pharmacy training. They are also paid by the government to review the use of medicines. In Scotland, a pharmacist can write prescriptions for Scottish registered patients for their usual medicines, most medicines except controlled drugs, when the patient cannot see a doctor, as can happen if they are away from home or the doctor is unavailable. In the United States, pharmacy practice has been increasingly influenced by the practice of pharmacy or clinical pharmacy. In addition, a Doctor of Pharmacy (Pharm. D.) degree is now required before becoming a pharmacist, and some pharmacists complete one or two years of a specialisation course or specialty training after graduation. In addition, consultant pharmacists, who have traditionally worked mainly in nursing homes, are now expanding into direct patient consultations under the name "senior care pharmacy".

**Question 0**

Which Canadian provinces restrict the rights of pharmacists to prescribe medicines?

**Question 1**

Who pays Australian pharmacists to carry out reviews of home remedies?

**Question 2**

Where are pharmacists in the UK getting paid more and more?

**Question 3**

Which sectors have had a growing impact on pharmacy in the US?

**Question 4**

Which degree is now required in the United States to become a licensed pharmacist?

**Question 5**

Which Canadian provinces are expanding the rights of pharmacists to prescribe medicines?

**Question 6**

Who can't pay Australian pharmacists to do home medicine checks?

**Question 7**

What are pharmacists paid less for in the UK?

**Question 8**

Which sectors have lost influence in the pharmaceutical sector in the US?

**Question 9**

Which qualification is no longer mandatory in the United States to obtain a pharmacist's licence?

**Text number 25**

The two symbols most commonly associated with pharmacy in English-speaking countries are morttel and morttel and the ℞ (recipere) symbol, which is often written in written text as "Rx". The symbol was also used until the early 20th century. Pharmacy organisations often use other symbols in their logos, such as the hygiene cup, cone measures and caduceus, often used in the Netherlands. Other symbols common in different countries include the green Greek cross in France, Argentina, the United Kingdom, Belgium, Ireland, Italy, Spain and India, the increasingly rare Gaper in the Netherlands, and the red stylised letter A in Germany and Austria (from the German word Apotheke, which comes from the same Greek root as the English word apothecary).

**Question 0**

Which two symbols stand for pharmacy in English-speaking countries?

**Question 1**

What symbol was used until the early 20th century?

**Question 2**

Which country uses the Hygiene Bowl as a symbol of pharmacy?

**Question 3**

In which countries is the red stylized letter A used to indicate a pharmacy?

**Question 4**

Which countries use the green Greek cross as a symbol of pharmacy?

**Question 5**

Which two symbols stand for pharmacy in non-English speaking countries?

**Question 6**

What symbol was used until the early 19th century?

**Question 7**

Which country no longer uses the Hygiene Bowl as a symbol of pharmacy?

**Question 8**

In which countries is the blue stylised letter A used to indicate a pharmacy?

**Question 9**

In which countries is the red Greek cross used as a symbol of pharmacy?

**Document number 459**

**Text number 0**

One of its earliest massive implementations was carried out by the Egyptians against the British occupation in the 1919 revolution. Civil disobedience is one of the many ways in which people have rebelled against laws they consider unjust. It has been used in many non-violent resistance movements in India (Gandhi's campaigns for independence from the British Empire), in the velvet revolution in Czechoslovakia and in East Germany to overthrow communist governments, in South Africa in the struggle against apartheid, the US civil rights movement, the singing revolution for Baltic independence from the Soviet Union, more recently the Rose Revolution in Georgia in 2003 and the Orange Revolution in Ukraine in 2004, and other various global movements.

**Question 0**

What do you call it when people rebel in society against laws they consider unjust?

**Question 1**

What is an example of great civil disobedience in South Africa?

**Question 2**

What was the name of the movement that led to the Baltic countries gaining independence from the Soviet Union?

**Question 3**

In which country did the Orange Revolution take place in 2004?

**Question 4**

Where was the site of the 2003 Rose Revolution?

**Question 5**

Which people brought forward one of the earliest examples of civil disobedience?

**Question 6**

Who was one of the earliest examples of civil disobedience?

**Question 7**

Why do people choose civil disobedience as a protest?

**Question 8**

What is civil disobedience protesting against?

**Question 9**

Which civil rights movement in the US was known for its disobedience?

**Question 10**

What is the definition of Germany introducing a communist government?

**Question 11**

What did the velvet revolution hope to achieve in India?

**Question 12**

Whose occupation did the Egyptians resist in the 2003 Rose Revolution?

**Question 13**

Which countries did the 1919 revolution want to bring independence from Russia?

**Question 14**

In which country was there a velvet revolution in 2004?

**Text number 1**

One of the oldest depictions of civil disobedience is in Sophocles' play Antigone, in which Antigone, one of the daughters of Oedipus, former king of Thebes, defies Creon, now king of Thebes, who tries to prevent her from giving her brother Polynices a proper funeral. She makes a moving speech in which she tells him that he must obey his conscience rather than the laws of men. She is not at all afraid of the death with which he threatens her (and which she eventually carries out), but she is afraid of how her conscience will punish her if she does not.

**Question 0**

Sofokles showed his civil disobedience in a play called?

**Question 1**

Who is Antigone's father in the play?

**Question 2**

What is the name of the current King of Thebes in the play?

**Question 3**

Which character in the play illustrates civil disobedience?

**Question 4**

What is Creon trying to stop Antigone from doing in the play?

**Question 5**

Which play depicted early civil disobedience?

**Question 6**

Who wrote the play Antigone?

**Question 7**

Who was the target of civil disobedience in Antigone?

**Question 8**

What was the Antigone demonstration about?

**Question 9**

How was civil disobedience reflected in Antigone?

**Question 10**

Which play by Oedipus shows civil disobedience?

**Question 11**

Who is Sofoklee's father?

**Question 12**

Who is Sophocles defying?

**Question 13**

Why does Sophocles defy Creon in the play?

**Question 14**

What must Sophocles do instead of doing the king's will?

**Text number 2**

After the Peterloo massacre in 1819, the poet Percy Shelley wrote a political poem later that year, Anarchy in Disguise, which begins with images of what he saw as unjust forms of authority in his time - and then describes the awakening of a new kind of social action. It is perhaps the first modern [vague] statement of the principle of non-violent protest. A version of it was introduced by the writer Henry David Thoreau in his essay Non-Aggression and later by Gandhi in his Satyagraha Doctrine. Gandhi's Satyagraha was partly influenced and inspired by Shelley's non-violence in protest and political action. In particular, Gandhi is known to have frequently quoted Shelley's Masque of Anarchy to the general public during his campaign for a free India.

**Question 0**

Which poet wrote the Anarchy Massacre after the Peterloo Massacre?

**Question 1**

His poem is considered the first of what kind of protest?

**Question 2**

Which famous author used the similarity and resemblance to Percy Shelly in his writings?

**Question 3**

Inspired by Shelley, what was the name of Gandhi's doctrine?

**Question 4**

Gandhi often referred to Shelley's poem in an attempt to do what?

**Question 5**

Who wrote the poem The Mark of Anarchy?

**Question 6**

The sign of anarchy was written as a protest against what?

**Question 7**

What was the principle behind the film The Mark of Anarchy?

**Question 8**

Which famous Indian practised civil disobedience?

**Question 9**

What was the name of Gandhi's work?

**Question 10**

What year did the Satyagraha murder take place?

**Question 11**

What did Gandhi write in 1819?

**Question 12**

Why did Gandhi write The Mask of Anarchy?

**Question 13**

What theme does Ghandi use to start Anarchy in disguise?

**Question 14**

What would Henry David Thoreau lend to the Indian public?

**Text number 3**

It has been argued that the term "civil disobedience" has always suffered from ambiguity, and in modern times it has become completely corrupted. Marshall Cohen points out, "It has been used to describe everything from a trial in the federal courts to the firing of a federal officer. In fact, for Vice President Agnew, it has become a code word to describe the activities of looters, arsonists, draft dodgers, campaign troublemakers, campus militants, anti-war protesters, juvenile delinquents, and political assassins."

**Question 0**

Vice President Agnew describes civil disobedience with what action?

**Question 1**

Civil disobedience has recently allegedly suffered from what?

**Question 2**

More in the current prevailing civil disobedience has turned and said to be?

**Question 3**

Which person claims that civil disobedience is used to describe everything?

**Question 4**

What do they say about civil disobedience nowadays?

**Question 5**

Who noted the different current uses of civil disobedience?

**Question 6**

How has civil disobedience evolved in modern times?

**Question 7**

Who in recent history gave civil disobedience a negative connotation?

**Question 8**

What has plagued the civil disobedience movement.

**Question 9**

What had Vice President Agnew always suffered from?

**Question 10**

What had happened to Vice President Agnew's position in modern times?

**Question 11**

What did Marchall Cohen say about crime?

**Question 12**

What kind of people were always involved in the court system?

**Question 13**

What kind of person would be involved in a test case in federal court?

**Text number 4**

LeGrande writes that "it is very difficult, if not impossible, to come up with a single all-encompassing definition. In examining the vast literature on the subject, the scholar of civil disobedience quickly finds himself in a maze of semantic problems and grammatical subtleties. Like Alice in Wonderland, he often finds that a particular terminology has no more (or less) meaning than the individual speaker intends it to convey." He encourages a distinction between legitimate protest, non-violent civil disobedience and violent civil disobedience.

**Question 0**

Who wrote that it is difficult to draw up a comprehensive definition of civil disobedience?

**Question 1**

Le Grande also wrote that to define the term civil disobedience so difficult to describe?

**Question 2**

What three terms does Le grand ask for?

**Question 3**

Le grand notes that students of civil disobedience often run into grammatical subtleties and what other problem?

**Question 4**

Le grand concludes that the author's words offer only what he intended them to mean in terms of this type of terminology?

**Question 5**

Who said it was difficult to write a good description of civil disobedience?

**Question 6**

How much literature has been written on civil disobedience?

**Question 7**

What is the question that haunts the literature on civil disobedience?

**Question 8**

What kind of demonstration falls within the scope of civil disobedience without aggression?

**Question 9**

What kind of civil disobedience involves aggression?

**Question 10**

Who wrote that it is difficult to define grammatical subtleties?

**Question 11**

What did LeGrande write about grammatical subtleties?

**Question 12**

What surrounds you when you try to study violence in society?

**Question 13**

How much of the grammar is written?

**Question 14**

Which novel did LeGrande write?

**Text number 5**

Civil disunity is usually defined as being related to the citizen's relationship with the state and its laws, as opposed to a constitutional impasse where two public authorities, especially two equally sovereign branches of government, are in conflict. For example, if the head of the government of a country refused to enforce a decision of the country's Supreme Court, there would be no civil disobedience because the head of the government would be acting as a public official rather than as a private citizen.

**Question 0**

If the head of government refuses to implement a Supreme Court decision, what terminology could be used?

**Question 1**

Constitutional deadlock is different from civil disobedience because it does not involve which type of person?

**Question 2**

How is civil disobedience typically defined in the context of citizens?

**Question 3**

When would a person be considered to have removed a constitutional deadlock?

**Question 4**

Constitutional deadlock is different from what key term?

**Question 5**

What does civil disobedience have to do with it?

**Question 6**

What is not civil disobedience?

**Question 7**

What kind of person cannot be considered a civil disobedience?

**Question 8**

Civil disobedience is mainly practised by which group of the population?

**Question 9**

Which group of people cannot participate in civil disobedience?

**Question 10**

Which two public agencies are in conflict with the definition of civil disobedience?

**Question 11**

With what else does the agency have a relationship within the definition of civil disobedience?

**Question 12**

How many citizens are caught up in a constitutional impasse?

**Question 13**

Which group is in favour of using conflict to resolve cases?

**Question 14**

The constitutional impasse concerns how the citizen relates to the state and to what?

**Text number 6**

This definition, however, is contradicted by Thoreau's political philosophy, which contrasts conscience and collectivity. The individual is the final judge of right and wrong. Moreover, since only individuals act, only individuals can act unjustly. When government knocks on the door, it is the individual in the form of the postman or tax collector whose hand hits the tree. Prior to Thoreau's imprisonment, when a bewildered tax collector had wondered aloud how his refusal to pay should be handled, Thoreau had advised: "Divorce". If one chose to be the perpetrator of injustice, Thoreau insisted, one had to face the fact that one made a choice. But if government is the "voice of the people", as it is often called, shouldn't that voice be listened to? Thoreau admits that government can express the will of the majority, but it can also express the will only of elite politicians. Even a good form of government "may be abused and distorted before the people can act through it". Moreover, even if government expresses the voice of the people, this fact would not compel obedience from individuals who disagree with what is being said. A majority may be powerful, but it is not necessarily right. What then is the proper relationship between the individual and the government?

**Question 0**

Which author argues that conscience versus collective?

**Question 1**

What was Thoreau's punishment for not paying his taxes?

**Question 2**

Thoreau argues that usually the majority rules, but their views collectively are sometimes?

**Question 3**

What did Thoreau ask a public figure to do for the taxman?

**Question 4**

Thoreau mentions, what kind of person could corrupt the system of government?

**Question 5**

Who is the final judge of right and wrong?

**Question 6**

Who is guilty of unfair behaviour?

**Question 7**

Who was famous for his disobedience to the taxman?

**Question 8**

What advice did Thoreau give to a tax collector who could not do his duty?

**Question 9**

What did Thoreau say about the majority?

**Question 10**

What was the taxman's political philosophy?

**Question 11**

What was the ultimate judge of the government?

**Question 12**

Who did the government refuse to pay?

**Question 13**

What did the government want Thoreau to do?

**Question 14**

Whose will can elite politicians follow, according to the government?

**Text number 7**

According to some theories of civil disobedience, civil disobedience is justified only against the state. Brownlee argues that civil disobedience against the decisions of non-governments such as unions, banks and private universities can be justified if it reflects "a broader challenge to the legal system that allows these decisions to be made". The same principle applies, he says, to the breaking of the law in protests against international organisations and foreign governments.

**Question 0**

According to some theories, civil disobedience is justified?

**Question 1**

Brownlee argues that disobedience can be justified against which institutions?

**Question 2**

Brownlee justifies civil disobedience against which branch of government?

**Question 3**

Browlee also touches on the fact that civil disobedience is ok in terms of?

**Question 4**

What do some theories claim about civil disobedience?

**Question 5**

Who says that public companies can also engage in civil disobedience?

**Question 6**

On what basis should you also protest against public enterprises?

**Question 7**

Which public learning institution is often the target of civil disobedience?

**Question 8**

Who believed that civil disobedience should only be used against the state?

**Question 9**

Against which two groups do trade unions consider civil disobedience to be justified?

**Question 10**

When is civil disobedience justified by trade unions against certain groups?

**Question 11**

In what other ways can disobedience be applied to international organisations and governments?

**Question 12**

When do the banks consider civil disobedience to be justified?

**Text number 8**

It is generally recognised that if a breach of the law does not take place in public, it must at least be publicly reported in order to constitute civil disobedience. However, Stephen Eilmann argues that if it is necessary to disobey rules that are contrary to morality, one may ask why disobedience should be public civil disobedience rather than a covert violation of the law. For example, if a lawyer wants to help his client overcome legal obstacles to protecting his natural rights, he may find that assisting in the falsification of evidence or perjury is more effective than open disobedience. This assumes that public morality does not prohibit deception in such situations. The Fully Informed Jury Association's publication "A Primer for Prospective Jurors" states, "Think of the dilemma German citizens faced when Hitler's secret police demanded to know whether they were hiding a Jew in their house." This is not true. By this definition, civil disobedience can be traced back to the Book of Exodus, where Zipporah and Puah refused Pharaoh's direct order but misrepresented how they did it (Exodus 1:15-19).

**Question 0**

If a violation of the law is not made public, it is not considered a violation of what term?

**Question 1**

Stephen Eilmann asks, why show public civil disobedience instead of what is a better idea?

**Question 2**

Stephen Eilmann presents a covert violation of the law in Nazi Germany. Citizens had illegally done what?

**Question 3**

Stephen Eildmann cites the oldest known example of civil disobedience in the Bible from what passage?

**Question 4**

Which two women defied Pharaoh in the story of Genesis?

**Question 5**

What must be done to have a non-public violation of the law recognised as civil disobedience?

**Question 6**

What is necessary to disobey?

**Question 7**

What is sometimes more effective than civil disobedience?

**Question 8**

Which dilemma is a good example of moral civil disobedience?

**Question 9**

Which book of the Bible deals with civil disobedience?

**Question 10**

What must be disclosed publicly so that you can still find a lawyer to represent you?

**Question 11**

Which publication is written by Stephen Eilmann?

**Question 12**

Where in the Bible does knowledge of the law originate?

**Question 13**

Which two women refused to commit perjury in Genesis?

**Question 14**

Which dilemma is a good example of a perjury?

**Text number 9**

There has been debate about whether civil disobedience must necessarily be non-violent. Black's Law Dictionary includes nonviolence in its definition of civil disobedience. Christian Bay's encyclopaedia article states that civil disobedience requires "carefully chosen and lawful means", but argues that these need not be non-violent. It has been argued that while both civil disobedience and civil rebellion are justified by invoking constitutional deficiencies, rebellion is far more destructive; therefore the deficiencies justifying rebellion are far more serious than those justifying civil disobedience, and if civil disobedience cannot be justified by civil rebellion, neither can the use of force and violence by civil disobedience and the refusal to submit to arrest. Abstention from violence by civil disobedients is also said to help maintain society's tolerance of civil disobedience.

**Question 0**

Cristian Bay's encyclopaedia concludes that civil disobedience includes not only what behaviour?

**Question 1**

Which dictionary contains a definition of non-violent?

**Question 2**

What other terminology is considered much more destructive?

**Question 3**

Civil disobedience, which is non-violent, is said to contribute to a society of what?

**Question 4**

Discussions on civil disobedience include or exclude what important practice?

**Question 5**

What kind of civil disobedience is generally accepted?

**Question 6**

What is sometimes called civil disobedience when violence is used?

**Question 7**

What is one consequence of the uprising?

**Question 8**

Why is it better that civil disobedience is not violent?

**Question 9**

What does Christian Bay do to help society tolerate civil disobedience?

**Question 10**

What is one thing that Black's Law Dictionary says a rebellion must have?

**Question 11**

What does rebellion require in the Christian Bay encyclopaedia?

**Question 12**

What does Black's Law Dictionary say that a rebellion does not have to be?

**Question 13**

According to Black's Law Dictionary, what is the consequence of rebellion?

**Text number 10**

Non-revolutionary civil disobedience is simply the non-observance of laws on the grounds that the individual conscience considers them "wrong", or as part of an effort to render certain laws ineffective, to have them repealed, or to exert pressure to get one's political wishes accepted on some other issue. Revolutionary civil disobedience is more like an active attempt to overthrow the government (or to change cultural traditions, social customs, religious beliefs, etc...). revolution need not be political, i.e. a "cultural revolution", but simply implies a broad and sweeping change in part of the social structure). Gandhi's actions have been described as revolutionary civil disobedience. It has been argued that the Hungarians led by Ferenc Deák showed revolutionary civil disobedience against the Austrian government. Thoreau also wrote of civil disobedience as a means of achieving 'peaceful revolution'. Howard Zinn, Harvey Wheeler and others have considered the right to "alter or abolish" an unjust government, as set out in the Declaration of Independence, as a principle of civil disobedience.

**Question 0**

What is it called when a government or belief system is actively being overthrown?

**Question 1**

Which group of people made revolutionary civil disobedience against the Austrian government?

**Question 2**

Under whose leadership did the Hungarians commit this act of civil disobedience?

**Question 3**

Revolutionary civil disobedience to culture is highlighted by the example of whom?

**Question 4**

What other issues can civil disobedience be linked to?

**Question 5**

What is a simple form of civil disobedience?

**Question 6**

Why would a person choose civil disobedience against certain laws?

**Question 7**

What is the goal of individual civil disobedience?

**Question 8**

What kind of civil disobedience is more widespread?

**Question 9**

Which famous Indian's actions were considered civil disobedience?

**Question 10**

What does non-revolutionary civil disobedience want to supplant?

**Question 11**

What does an individual's conscience not need to be?

**Question 12**

What did Ghandi say in the Declaration of Independence about the right to abolish an unjust government?

**Question 13**

What did Gandhi think would be achieved by the use of conscience?

**Question 14**

What did Harvey Wheeler tell Hungarians to do?

**Text number 11**

The earliest recorded cases of collective civil disobedience occurred during the Roman Empire[citation needed]. Unarmed Jews gathered in the streets to prevent the installation of pagan images in the Temple in Jerusalem.[citation needed][original research?] In modern times, some activists committing civil disobedience as a group collectively refuse to sign bail until certain requirements are met, such as favorable bail conditions or the release of all activists. This is a form of prison solidarity.[page needed] There have also been many cases of solitary civil disobedience, such as the civil disobedience by Thoreau, but these sometimes go unnoticed. Thoreau was not yet a well-known writer at the time of his arrest, and his arrest was not covered in any newspaper in the days, weeks and months after it happened. The tax collector who arrested him rose to higher political office, and Thoreau's essay was not published until after the end of the Mexican War.

**Question 0**

When did the first examples of civil disobedience as a whole occur?

**Question 1**

What did the Jews do to keep pagan objects out of the Temple in Jerusalem?

**Question 2**

Since Thoreau was not a well-known writer, what happened when he was arrested?

**Question 3**

What position did the tax collector who arrested Thoreau get?

**Question 4**

When was Thoreau's essay published?

**Question 5**

When is the oldest recorded case of civil disobedience?

**Question 6**

What was the aim of this Roman disobedience?

**Question 7**

What is the recent civil disobedience that has been done in a group format?

**Question 8**

What is called civil disobedience, where people refuse to liberate?

**Question 9**

How long did it take before Thoreau's disobedience became known?

**Question 10**

What happened during the Mexican War?

**Question 11**

What were the tax collectors trying to prevent from being installed in the temple?

**Question 12**

What do those in political office refuse to sign when they take part in civil disobedience?

**Question 13**

How was the news reported about an incident where tax collectors arrested Jews?

**Question 14**

When was the essay written by contemporary activists published?

**Text number 12**

Non-demonstrators have chosen a variety of illegal acts. Bedau writes: "There is a whole class of acts undertaken in the name of civil disobedience which, even if widely practised, would in themselves be little more than a nuisance (e.g., trespassing on a nuclear missile site)... Such acts are often nothing more than a nuisance and, at least to a bystander, somewhat irrational... The distance of the link between the disobedient act and the disapproving law makes such acts vulnerable to accusations of inefficiency and irrationality." However, Bedau also points out that the harmlessness of such entirely symbolic illegal protests against public policy goals may serve a propaganda purpose. Some civil protesters, such as the owners of illegal medical cannabis dispensaries and Voice in the Wilderness, which brought medicine into Iraq without US government permission, directly achieve a desired social goal (such as providing medicine to the sick) while openly breaking the law. Julia Butterfly Hill lived in Luna, a 55-meter (180-foot) tall, 600-year-old California redwood tree for 738 days and successfully prevented its felling.

**Question 0**

Non-insurgents have chosen a wide range of what kind of behaviour?

**Question 1**

Bedau says that illegal protests against public policy can serve what purpose?

**Question 2**

Which civil disobedience group brought medicine into Iraq without government permission?

**Question 3**

How long did Julia Butterfly Hill live in a tree?

**Question 4**

What was the result of California's redwood settlement?

**Question 5**

What kind of actions are sometimes taken in civil disobedience?

**Question 6**

What is an example of illegal disobedience?

**Question 7**

What types of demonstrations are usually held?

**Question 8**

What kind of objectives are usually pursued bypassing the law?

**Question 9**

Who lived in a tree to prevent it from being felled in a form of civil disobedience?

**Question 10**

How long did Julia Butterfly Hill live near a nuclear missile facility?

**Question 11**

Where did Bedau live to prevent it from falling?

**Question 12**

According to Julia Butterfly HIll, what do symbolic protests achieve?

**Question 13**

Which company was Bedau part of when he broke the law by bringing medicines into Iraq?

**Question 14**

What is Julia Butterfly Hill's example of an inefficient and irrational act?

**Text number 13**

In cases where the criminalised conduct is merely speech, civil disobedience may simply consist of the use of prohibited speech. An example is WBAI's broadcast of the song "Filthy Words" from George Carlin's comedy album, which ultimately led to the 1978 Supreme Court case FCC v. Pacifica Foundation. Threatening government officials is another classic way of expressing defiance of government and an unwillingness to tolerate its policies. For example, Joseph Haas was arrested for allegedly sending an email to a town councillor in Lebanon, New Hampshire, which read: "Wise up or die".

**Question 0**

What was Joseph Haas arrested for?

**Question 1**

What did Joseph Haas say in his email?

**Question 2**

Civil disobedience can happen when people talk about a particular issue that is considered?

**Question 3**

WBAI broadcasts Some of George Carlin's comedies eventually led to what?

**Question 4**

What year was the case heard by the Supreme Court?

**Question 5**

What is the kind of criminal behaviour that is difficult for the authorities to stop?

**Question 6**

What is one way to use clean speech to get as many people as possible to protest?

**Question 7**

How can you protest against the government individually?

**Question 8**

What is one form of digital civil disobedience that can have far-reaching consequences?

**Question 9**

What did George Carlin send to the New Hampshire City Council?

**Question 10**

What did George Carlin tell the New Hampshire City Council to do?

**Question 11**

What happened to George Carlin after he sent the email?

**Question 12**

What lawsuit was the eventual result of Joseph Haas sending an email to the New Hampshire City Council?

**Question 13**

How can you protest against the WBAI and its policies as an individual?

**Text number 14**

Some forms of civil disobedience, such as illegal boycotts, refusal to pay taxes, conscientious objection, decentralised denial of service attacks and sit-ins, make the system difficult to operate. They can therefore be considered coercive. Brownlee points out that "although the use of coercive measures by civil disobedients is limited by their conscientious aim of engaging in moral dialogue, they may nevertheless feel the need to use limited coercive measures to get their case on the table". Plowshares temporarily closed GCSB Waihopai by locking the gates and using shrapnel to clear one of the large domes covering two satellite dishes.

**Question 0**

Boycotting, refusing to pay taxes, sitting on the bench and evading military service make it harder to what?

**Question 1**

Name one way in which Plowshares is temporarily closing GCSB Waihopai?

**Question 2**

Name another way in which Plowshares was temporarily closed?

**Question 3**

Brownlee argues that sometimes people behave in what way to get their point across?

**Question 4**

When large groups of people boycott the system or don't pay taxes, can it be kept?

**Question 5**

What is a form of disobedience to the federal government?

**Question 6**

What is the unfortunate side effect of such demonstrations?

**Question 7**

What is the aim of many of these demonstrations?

**Question 8**

How can you protest non-violently against big business?

**Question 9**

What did the denial of service attacks do to Plowshares?

**Question 10**

What is considered to be the use of moral dialogue when the law is not respected?

**Question 11**

What action did Brownlee take against the GCSB Waihopai that led to its temporary closure?

**Question 12**

What method does the government use to make its voice heard?

**Question 13**

Why does the government restrain itself when it disobeys?

**Text number 15**

Many of the same decisions and principles that apply in other criminal investigations and arrests also apply in civil disobedience cases. For example, the suspect must decide whether or not to consent to a search of his property and whether or not to talk to the police. There is general agreement in the legal community, and often a belief among activists, that it is not helpful and can even be harmful for a suspect to talk to investigators. However, some civil disobedients have found it difficult to resist answering investigators' questions, sometimes because they do not understand the legal implications or fear appearing rude. Some civil disobedients also seek to use arrest as an opportunity to impress the police. Thoreau wrote: "My civil neighbor, the tax collector, is just the man with whom I must deal - for after all, I quarrel with men and not with parchment - and he has voluntarily chosen to be an agent of the government. How can he ever know well what he is and does as a government official or as a man before he is forced to consider whether he treats me, his neighbor whom he respects, as a neighborly and benevolent man or as a maniac and disturber of the peace, and see if he can overcome this obstacle to his neighborliness without his action being met by a more impertinent and impassioned thought or speech."

**Question 0**

What government studies on civil disobedience?

**Question 1**

What is the way you can show the police civil disobedience ?

**Question 2**

What should you avoid when talking to the authorities?

**Question 3**

What are the reasons for disobedience to the authorities?

**Question 4**

Why do some people deliberately oppose law enforcement?

**Question 5**

What applies to both tax collection and asset tracing?

**Question 6**

Why do some people find it difficult not to talk to a tax official?

**Question 7**

Who do some tax authorities want to impress during an arrest?

**Question 8**

What should a person diagnosed as crazy decide when dealing with the police?

**Question 9**

What did Thoreau believe about talking to the police?

**Text number 16**

Some of those who are not involved in civil strife feel they are forced to accept punishment because they believe in the validity of the social contract. The social contract is considered to bind everyone to obey the laws imposed by a government that meets certain requirements of legitimacy, or else they will face the punishments prescribed by law. Other noncitizens who support the existence of a government still do not believe in the legitimacy of their own government or do not believe in the legitimacy of a particular law enacted by it. And yet other civil disobedients, who are anarchists, do not believe in the legitimacy of any government and therefore see no need to accept punishment for breaking a criminal law that does not violate the rights of others.

**Question 0**

What some non-civil society people feel the need to acknowledge.

**Question 1**

Why do we need to accept punishment?

**Question 2**

What do some people object to?

**Question 3**

What is the name of the group that does not agree with the government at all?

**Question 4**

Anarchists do not want to accept punishment for what reason?

**Question 5**

Why do anarchists want to accept punishment?

**Question 6**

What do anarchists accept about the role of government?

**Question 7**

Although anarchists support the government, what do they not believe in?

**Question 8**

What do anarchists feel they must accept as the consequences of their law-breaking?

**Question 9**

Why does the government exist according to anarchists?

**Text number 17**

In civil offences, it is important to decide whether or not to plead guilty. There is much debate on this issue, with some believing that civil disobedience must be subject to the punishment imposed by the law, while others believe that defending oneself in court increases the possibility of changing an unjust law. It has also been argued that both options are compatible with the spirit of civil disobedience. The ACT-UP Civil Disobedience Training Manual states that a civil disobedient who pleads guilty is essentially saying, "Yes, I did the act I am accused of. I do not deny it; in fact, I am proud of it. I feel I did the right thing in breaking this particular law; I am guilty as charged," but the plea of not guilty is a message. I feel I have done nothing wrong. I may have broken some specific laws, but I am not guilty of doing anything wrong. Therefore, I confess my innocence. "Pleading innocent is sometimes seen as a compromise between the two. One defendant accused of illegally opposing nuclear power, when asked to plead, stated that "I plead for the beauty around us"; this is called a "creative plea" and is usually interpreted as a plea of not guilty.

**Question 0**

What is an important personal decision for civil disobedience?

**Question 1**

What duty do some people think the non-combatants have?

**Question 2**

Why would anyone plead guilty to a crime involving civil disobedience?

**Question 3**

What reason is sometimes given for pleading not guilty in these cases?

**Question 4**

Which third plea uses creative words?

**Question 5**

Which group should decide whether to make a creative appeal or not?

**Question 6**

What is the same as a non-exclusion ground?

**Question 7**

What do some people think is ACT UP's duty when it gets caught?

**Question 8**

What do people who claim indisputability believe about defensiveness?

**Question 9**

A plea of no contest is a compromise between a creative accusation and which allegation?

**Text number 18**

When the Committee for Nonviolent Action organized a demonstration at the Camp Mercury nuclear test site near Las Vegas, Nevada, in August 1957, 13 protesters tried to enter the test site, knowing they would be arrested. At a prearranged time, they crossed the "line" one by one and were immediately arrested. They were put on a bus and taken to the town of Tonopah in Nye County, Nevada, and arraigned before a local justice of the peace that afternoon. Francis Heisler, a well-known civil rights lawyer, had volunteered to defend the detainees and advised them to plead "nolo contendere" as an alternative to pleading guilty or not guilty. However, the arrested persons were found "guilty" and given suspended sentences, conditional on their not returning to the test site.

**Question 0**

Where was the famous demonstration in Las Vegas?

**Question 1**

What was the civil disobedience at the time of the trial?

**Question 2**

What was the result of disobedience against the nuclear power plant?

**Question 3**

How did their lawyer suggest they respond to the charge?

**Question 4**

What kind of sentences did the protesters receive?

**Question 5**

What was Francis Heisler sponsoring in August 1957?

**Question 6**

Where was Francis Heisler going to hold his demonstration?

**Question 7**

How many missiles were in the nuclear test range?

**Question 8**

Where was Francis Heisler taken after the demonstration?

**Question 9**

What was Francis Heisler's sentence when he was found guilty?

**Text number 19**

Howard Zinn writes: "Often protesters may go to prison to continue their protest and remind their fellow countrymen of the injustice. But that's different from the idea that they have to go to jail as part of a rule of civil disobedience. The key point is that the spirit of protest must be maintained at all times, whether it is by being in prison or by avoiding it. Accepting prison with remorse as joining the 'rules' implies an abrupt shift into a state of submission, a depreciation of the seriousness of the protest... In particular, the neoconservative insistence on guilt should be dropped."

**Question 0**

Why do some people go to prison for disobedience?

**Question 1**

What goal of civil disobedience was achieved by going to prison?

**Question 2**

What is the most important thing to observe civil disobedience?

**Question 3**

Why shouldn't you go to prison?

**Question 4**

What are the two reasons why the Conservatives went to prison?

**Question 5**

What is the main purpose of a conservative and a demonstration?

**Question 6**

What does Howard Zinn think should be removed?

**Question 7**

What does following the rules help to preserve in a protest?

**Question 8**

What does conservatism have to do with the severity of the protest?

**Text number 20**

Sometimes the prosecutor offers plea bargains to civil disobedience, as in the Camden 28 case, where defendants were offered the chance to plead guilty to one misdemeanor and avoid jail time. In some mass incarceration situations, activists choose to use solidarity tactics to ensure that everyone gets the same deal. However, some activists have chosen to plead guilty blindly without any agreement. Mohandas Gandhi pleaded guilty and told the court, "I am here to submit joyfully to the highest punishment that can be inflicted on me for what is a deliberate crime under the law and what I consider to be the highest duty of a citizen." He said he was guilty.

**Question 0**

What kind of punishment is sometimes offered to civil disobedience?

**Question 1**

What is usually the aim of a plea bargain?

**Question 2**

When many people are arrested, what is the general negotiating tactic?

**Question 3**

What kind of petition is sometimes considered disobedience?

**Question 4**

Which famous Indian took the blame and surrendered himself to justice?

**Question 5**

What did the prosecution present at Ghandi's trial?

**Question 6**

Which group decided to make a blind confession without a prison sentence?

**Question 7**

What did Ghandi decide to use to make sure everyone got the same deal?

**Question 8**

How did the Camden 28 decide to go to court after pleading guilty?

**Question 9**

How did Camden 28 describe its activities to the court?

**Text number 21**

Some people accused of civil disobedience make defiant or explanatory speeches in court. In U.S. v. Burgos-Andujar, the defendant, who was involved in a movement to prevent military exercises by invading U.S. Navy property, argued to the court in allocution that "those who violate the greater law are members of the Navy." As a result, the judge increased his sentence from 40 days to 60 days. This measure was upheld because, according to the US Court of Appeals for the First Circuit, his statement showed a lack of remorse, an attempt to avoid responsibility for his actions and even the likelihood of repeating his illegal acts. Other speeches by protesters complained about the mistreatment of government officials.

**Question 0**

In what way do some people practice civil disobedience in a constructive way?

**Question 1**

Why would anyone want to make a speech?

**Question 2**

Why is defiant speech sometimes more harmful to the individual?

**Question 3**

Why would you want to impose more penalties?

**Question 4**

What kind of treatment do non-citizens usually receive?

**Question 5**

What do some government officials give in response to illegal actions?

**Question 6**

Why did the Navy make a speech in court?

**Question 7**

How much did the Navy increase the defendant's sentence?

**Question 8**

What was mentioned in the speeches given by the navy about the treatment of the protesters?

**Question 9**

Why was the sentence of a member of the US military increased in Burgos-Andujar v. United States?

**Text number 22**

Steven Barkan writes that if defendants plead not guilty, "they must decide whether their primary goal is to obtain an acquittal and avoid a prison sentence or fine, or to use the trial as a forum in which they can tell the jury and the public about the political circumstances of the case and the reasons why they are breaking the law through civil disobedience." A technical defense may improve the chances of an acquittal, but it can make the trial more boring and reduce the press coverage. During the Vietnam War, the Chicago Eight used a political defence, while Benjamin Spock used a technical defence. In countries like the United States, where laws guarantee the right to a jury trial but do not excuse violations of the law for political reasons, some opponents of civil disobedience seek jury nullification. Over the years, this has been complicated by court decisions such as Sparf v. United States, which held that a judge need not inform jurors of their right to nullification, and United States v. Dougherty, which held that a judge need not allow defendants to openly seek jury nullification.

**Question 0**

What is the primary objective when you are arrested for civil disobedience, when you plead innocence?

**Question 1**

What is the secondary objective of an acquittal?

**Question 2**

What would a civilly disobedient person do in court?

**Question 3**

Where in the US war are there many civil unrest?

**Question 4**

What can sympathetic juries do in cases where there is a civil disobedience?

**Question 5**

What defence did Steven Barkan use?

**Question 6**

What kind of press coverage is there when the accused pleads not guilty?

**Question 7**

What is the main goal in trying to get a jury nullification during the trial?

**Question 8**

What kind of guilty plea was entered in the case of the United States v. Dougherty?

**Question 9**

What did the judge have to tell the jury in the Chicago Eight case?

**Text number 23**

One theory is that while disobedience can be beneficial, a high level of disobedience would undermine the law by encouraging general disobedience, which is neither conscientious nor socially beneficial. Therefore, conscientious lawbreakers must be punished. Michael Bayles argues that if a person breaks the law to create a test case for the constitutionality of the law and then wins his case, the act was not civil disobedience. It has also been argued that breaking the law for self-gratification, as in the case of a homosexual or cannabis user who does not direct his act to secure the repeal or amendment of the law, is not civil disobedience. Similarly, a demonstrator who attempts to avoid punishment by committing a crime in secret and avoiding prosecution, by denying the commission of the crime or by fleeing the country, is not generally considered to be in civil disobedience.

**Question 0**

What should civil disobedience avoid?

**Question 1**

Why should civil disobedience be avoided?

**Question 2**

What is one of the main reasons why civil disobedience is not recognised?

**Question 3**

Why shouldn't someone commit a crime when protesting?

**Question 4**

Why would someone avoid crime by protesting?

**Question 5**

What does a large amount of masturbation impair?

**Question 6**

What would happen if you focused only on self-gratification?

**Question 7**

What is one of the reasons why the change in the law is not recognised?

**Question 8**

What does a conscientious approach to the law lead to?

**Question 9**

Why should the public avoid winning a case?

**Text number 24**

The courts have distinguished between two types of civil disobedience: "Indirect civil disobedience involves the violation of a law that is not itself the object of the protest, while direct civil disobedience involves protesting the existence of a particular law by violating that law. "During the Vietnam War, courts typically refused to exempt from punishment those guilty of unlawful demonstrations on the grounds that they were challenging the legality of the Vietnam War; the courts considered the issue to be political. Civil disobedience actors have sometimes used the defence of necessity as a cover to deny their guilt without condemning their politically motivated actions and to present their political beliefs in court. However, court cases such as U.S. v. Schoon have severely limited the availability of political necessity defense. When Carter Wentworth was indicted for his involvement in the 1977 illegal seizure of the Seabrook nuclear power plant by the Clamshell Alliance, the judge instructed the jury to disregard his competing harm defense and he was found guilty. Fully Informed Jury Association activists have sometimes distributed educational flyers in courthouses despite the exhortations; according to FIJA, many of them have avoided prosecution because "prosecutors have concluded (correctly) that if they arrest fully informed jury flyer distributors, the flyers must be given to the flyer distributor's own jury as evidence."

**Question 0**

Why is it called a violation of a law that is not the aim of the protest?

**Question 1**

What is it called when the law is the direct object of protest?

**Question 2**

Which US war caused a large amount of civil disobedience?

**Question 3**

What kind of defence do protesters sometimes use in court?

**Question 4**

Why have people who distribute leaflets inside the courts not been arrested?

**Question 5**

What is indirect civil disobedience protesting against the law?

**Question 6**

What does direct civil disobedience do to a law that is not protested against?

**Question 7**

Who handed out educational leaflets in courtrooms during the Vietnam War?

**Question 8**

What did Carter Wentworth hand over in court to avoid prosecution?

**Question 9**

If he were arrested, what would happen to the leaflets Carter Wentworth distributed in court?

**Text number 25**

Along with giving the offender "just deserts", the prevention of crime through incapacity and deterrence is the main objective of criminal punishment. Brownlee argues that "bringing deterrence to the level of justification reduces the law's commitment to a moral dialogue with the offender as a rational person, because it focuses attention on the threat of punishment rather than on the moral reasons for complying with the law". Leonard Hubert Hoffmann writes: "In deciding whether or not to impose a punishment, the most important consideration should be whether it will do more harm than good. This means that the opponent has no right not to be punished. It is up to the state (including judges) to decide on utilitarian grounds whether or not to punish."

**Question 0**

What is the main purpose of non-civil criminal sanctions?

**Question 1**

What should be the main objective of not using punishment in a fair system?

**Question 2**

Who decides the fate of protesters most often?

**Question 3**

What should be the basis of punishment in a just society?

**Question 4**

What is a major reason why judges use morality against crime?

**Question 5**

What does focusing on morality help the judge to achieve?

**Question 6**

Who decides whether a law is moral?

**Question 7**

What is the most important thing when deciding whether a law is moral?

**Question 8**

On what basis is a law considered moral?

**Document number 460**

**Text number 0**

Construction is the construction of a building or infrastructure. Construction differs from manufacturing in that manufacturing typically involves the mass production of similar products without a designated buyer, whereas construction typically takes place on site for a known customer. Construction as an industry accounts for between six and nine percent of GDP in developed countries. Construction starts with planning, design and financing and continues until the project is built and ready for use.

**Question 0**

What is the process of constructing a building or infrastructure?

**Question 1**

What is typically involved in mass production of similar products without a designated buyer?

**Question 2**

What percentage of GDP does construction account for?

**Question 3**

What three things are needed for construction to take place?

**Question 4**

On-site construction for whom?

**Question 5**

What is the limited production associated with a designated purchase?

**Question 6**

What usually happens at the location of an unknown client?

**Question 7**

What does the 69% consist of?

**Question 8**

What three things are recommended before starting construction?

**Question 9**

Where does the manufacturing take place?

**Question 10**

How much of the GDP of industrialised countries does industry account for?

**Question 11**

What is involved in mass production of similar products without planning?

**Question 12**

How long will the manufacturing process continue?

**Question 13**

What three things do you need for manufacturing to take place?

**Text number 1**

Large-scale construction requires multidisciplinary cooperation. Usually the architect leads the work, while the construction manager, design engineer, civil engineer or project manager supervises. Effective planning is essential to the successful completion of a project. Those involved in the design and construction of such infrastructure must take into account zoning requirements, the environmental impact of the work, successful scheduling, budgeting, site safety, availability and transport of construction materials, logistics, public inconvenience due to construction delays, tendering, etc. The largest construction projects are called mega-projects.

**Question 0**

Who usually manages the construction work?

**Question 1**

Who usually supervises construction work?

**Question 2**

What is essential for the successful implementation of the project?

**Question 3**

What are the biggest construction projects?

**Question 4**

Planning requirements, environmental impact, budgeting and logistics are all things that should be taken into account?

**Question 5**

What is work done primarily and independently?

**Question 6**

What does a civil engineer do?

**Question 7**

What is the term for any major construction project?

**Question 8**

What is rarely taken into account by those involved in the design and implementation of the information architecture?

**Question 9**

What requires cooperation between zoning requirements?

**Question 10**

Who usually takes care of the environmental impact of work?

**Question 11**

Who generally controls public nuisance?

**Question 12**

What is the largest infrastructure in question?

**Question 13**

What is needed to successfully complete the tendering process for the project?

**Text number 2**

Broadly speaking, there are three sectors of construction: buildings, infrastructure and industry. Building construction is usually further subdivided into residential and non-residential (commercial/institutional). Infrastructure is often referred to as heavy/road, heavy civil engineering or heavy engineering. It includes major public works, dams, bridges, highways, water and sewage supply and distribution of utilities. Industry includes refineries, chemical processes, power generation, factories and manufacturing plants. There are other ways of dividing industry into sectors or markets.

**Question 0**

What are the three sectors of construction?

**Question 1**

What are the general categories of building construction?

**Question 2**

What is often called infrastructure?

**Question 3**

Which construction sector includes large public works, dams, bridges, highways, water and sewage supply and distribution of utilities?

**Question 4**

Refineries, process chemicals, power generation, mills and production plants belong to which construction sector?

**Question 5**

What are buildings, structures and industry?

**Question 6**

What types of buildings are divided into private and public buildings?

**Question 7**

Which sector has large public works but no utilities distribution?

**Question 8**

Which sector includes utilities distribution and refineries?

**Question 9**

What are the three types of public works?

**Question 10**

How will utility distribution be further divided?

**Question 11**

What are refineries often called?

**Question 12**

What are some examples of markets?

**Question 13**

How can residential and non-residential buildings also be divided?

**Text number 3**

Engineering News-Record (ENR) is a trade magazine for the construction industry. ENR compiles and reports annually on the size of engineering and construction firms. It publishes a list of the largest firms in the US (Top-40) and also a list of the largest global firms (Top-250 in terms of the amount of work they do outside their home country). In 2014, ENR compiled data by nine market segments. They were divided into the following categories: transport, oil, buildings, energy, industry, water, manufacturing, sanitation/waste, telecommunications, hazardous waste, and a tenth category for other projects. In reporting on the Top 400 list, it used data on transport, sewerage, hazardous waste and water management to classify companies as heavy contractors.

**Question 0**

What is Engineering News-Record?

**Question 1**

What collects and reports data on the size of design and construction companies?

**Question 2**

In which year did ENR collect data from nine market segments?

**Question 3**

ENR used data on what ranks the Top 400 companies as heavy contractors?

**Question 4**

What is a design magazine?

**Question 5**

Who reports on the size of heavy equipment and construction companies?

**Question 6**

Which US companies are in the Top 250?

**Question 7**

How are the biggest global companies selected for the Top 40?

**Question 8**

What did the ENR gather in 2004?

**Question 9**

What is a magazine for design companies?

**Question 10**

What do global companies report on the construction industry?

**Question 11**

What is one thing that market segments publish?

**Question 12**

What is reflected in the published list of the 250 largest transport markets?

**Question 13**

In what year did the largest US companies compile data on nine market segments?

**Text number 4**

The Standard Industrial Classification and the more recent North American Industry Classification System provide a classification system for companies engaged in construction or otherwise involved in the construction industry. In order to identify differences between companies in the sector, it is divided into three sub-sectors: building construction, heavy and civil engineering and specialised contractors. In addition, there are categories for construction service companies (e.g. engineering firms, architects) and construction managers (companies that manage construction projects without direct financial responsibility for the completion of the construction project).

**Question 0**

What are the three sub-sectors of construction?

**Question 1**

What are the other categories for?

**Question 2**

What is the classification system for construction companies?

**Question 3**

What are construction managers?

**Question 4**

What are the three building sub-sectors?

**Question 5**

Which classification system is newer than the North American Industrial Classification System?

**Question 6**

Who has a rating system for all North American companies?

**Question 7**

Who manages construction projects and takes financial responsibility for their implementation?

**Question 8**

What systems are used to classify contractors?

**Question 9**

How are technical differences identified?

**Question 10**

Which are the three sub-sectors of construction project management companies?

**Question 11**

What is heavy and civil engineering not doing in project management?

**Question 12**

Who has the system for companies that have financial responsibility for completing the project?

**Text number 5**

Building construction is the addition of structures to a property or the construction of buildings. Most house building work is minor repairs, such as adding a room or renovating a bathroom. Often the property owner acts as the contractor, payroll and design team for the entire project. Although house building projects usually have many common elements such as design, financing, estimating and legal aspects, many projects of different sizes end up with undesirable outcomes such as structural collapse, cost overruns and/or litigation. For this reason, people with experience in the field will prepare detailed plans and monitor carefully during the project to ensure a positive outcome.

**Question 0**

What is the process of adding structure or building on a property?

**Question 1**

What is the majority of house building work?

**Question 2**

Who will act as the contractor, payroll and design team for the renovation project?

**Question 3**

What are some examples of undesirable outcomes of a project?

**Question 4**

What is the industry doing to ensure a positive outcome?

**Question 5**

What are the main components of new housing?

**Question 6**

What are the overall results of the project?

**Question 7**

What do people with experience not have to do?

**Question 8**

What formman works in addition to the paymaster?

**Question 9**

What are the common elements often?

**Question 10**

How will detailed plans and careful monitoring be increased?

**Question 11**

What are the most detailed plans for construction?

**Question 12**

What are the elements that make up the room print?

**Question 13**

What are some examples of the legal aspects of the addendum?

**Text number 6**

Residential construction practices, techniques and resources must comply with local building authority regulations and codes of practice. Materials readily available in the area will usually determine the building materials used (e.g. brick vs. stone vs. wood). The cost of building a house per square metre (or square foot) can vary considerably depending on site conditions, local regulations, economies of scale (custom-designed houses are often more expensive to build) and the availability of skilled tradesmen. As housing construction (like all construction) can generate a lot of waste, careful planning is needed.

**Question 0**

What housing construction practices, techniques and resources must be respected?

**Question 1**

What usually determines the building materials used?

**Question 2**

Residential construction can produce what is not carefully designed?

**Question 3**

Site conditions, local regulations, economies of scale and the availability of skilled tradespeople all influence what?

**Question 4**

What local rules must be respected?

**Question 5**

What do custom-designed homes say in the area?

**Question 6**

What are the circumstances that lead to variations in the availability of skilled professionals?

**Question 7**

What are the impacts of technologies and resources?

**Question 8**

What needs to happen to prevent building regulations?

**Text number 7**

In construction, new techniques are being explored, made possible by the development of 3D printing technology. In the form of additive construction, similar to additive manufacturing of fabricated parts, construction printing allows small commercial buildings and private residences to be built flexibly in around 20 hours, with built-in plumbing and electrical equipment, as a single continuous construction job using large 3D printers. Working versions of 3D printing construction technology are already printing 2 metres of building material per hour as of January 2013[update], and the next generation of printers can print 3.5 metres per hour, enough to complete a building in a week. Dutch architect Janjaap Ruijssenaars' 3D-printed building of performative architecture is due to be built in 2014.

**Question 0**

In construction, new technologies are being explored, made possible by developments in which sector?

**Question 1**

Building printing allows flexible construction of small commercial buildings and private dwellings in what timeframe?

**Question 2**

Dutch architect Janjaap Ruijssenaars' 3D-printed building of performative architecture is due to be built when?

**Question 3**

How much building material is printed per hour already in working versions of 3D printing technology?

**Question 4**

What will Janjaap Ruijssenaar build in 2013?

**Question 5**

What makes research on built-in pipelines possible?

**Question 6**

What does flexible construction look like?

**Question 7**

How long does it take to build electricity plants?

**Question 8**

How fast will building materials be printed from 2014 onwards?

**Text number 8**

In today's industrialised world, construction usually involves turning plans into reality. A formal design team may be assembled to design physical procedures and integrate these procedures with other components. The design usually consists of drawings and specifications, usually prepared by a design team that includes an architect, civil engineers, mechanical engineers, electrical engineers, structural engineers, fire protection engineers, design consultants, architectural consultants and archaeological consultants. The design team is usually employed by (i.e. contracted to) the property owner. Under this system, once the design team has completed the design, several construction firms or construction management companies may be invited to bid for the design, based either directly on the design or on drawings and quantity surveying prepared by a quantity surveying expert. After evaluating the bids, the owner will usually award the contract to the most cost-effective bidder.

**Question 0**

Construction involves turning what?

**Question 1**

What can a formal planning group be set up for?

**Question 2**

Who most often employs the design team?

**Question 3**

Who will provide the quantity list?

**Question 4**

Who does the owner usually sign the contract with?

**Question 5**

What does the volume counter do with planning?

**Question 6**

Which group prepares the job offer?

**Question 7**

To whom does the owner give the list of quantities?

**Question 8**

What are construction companies being asked to design?

**Text number 9**

The current trend in design is to combine previously separate specialisms, especially in large companies. In the past, architects, interior designers, engineers, builders, construction managers and general contractors were more likely to be completely separate businesses, even in large companies. Today, a firm that is nominally an 'architecture' or 'construction management' firm may have specialists in all the relevant disciplines on staff, or may have an associate company that provides the skills required for each. Thus, each such firm can offer itself as a "one-stop shop" from the start to the end of a construction project. This is known as a "design-build contract", where the contractor is given a specification and has to carry out the project from design to construction, following the same specification.

**Question 0**

What is the modern trend in design?

**Question 1**

Even in large companies, architects, interior designers, engineers, developers, construction managers and general contractors were more likely to be what?

**Question 2**

In today's world, companies can offer themselves to what construction project?

**Question 3**

What kind of contract is concluded when a contractor is given a performance specification and has to carry out the project from design to construction in accordance with the performance specification?

**Question 4**

What is the trend in architects' skills?

**Question 5**

What kind of employees does an interior design company usually have?

**Question 6**

What do engineers offer themselves to the project?

**Question 7**

What is the description of an associate agreement?

**Question 8**

Which groups were previously considered integrated?

**Text number 10**

Several project structures can help owners in this integration, such as design and build projects, partnerships and construction management. In general, each of these project structures allows the owner to integrate the services of architects, interior designers, engineers and builders during design and construction. As a result, many companies are growing beyond the traditional provision of design or construction services alone, and are placing more emphasis on building relationships with other necessary participants through the design and construction process.

**Question 0**

Which project structures help the owner to integrate?

**Question 1**

These project structures allow the owner to integrate the services of whom during design and construction?

**Question 2**

Many construction companies are now putting more emphasis on what?

**Question 3**

What is the emphasis on partnerships and construction management in the design-build process?

**Question 4**

What helps the owner to design and build?

**Question 5**

Whose services will construction services integrate during design and construction?

**Question 6**

What helps interior designers during integration?

**Question 7**

What will grow in addition to architects' services because of integration?

**Text number 11**

Construction projects can suffer from preventable financial problems. Underpriced bids arise when builders ask for too little money to complete a project. Cash flow problems arise when the current level of funding cannot cover current labour and material costs and, as it is a question of the sufficiency of funds at a given point in time, problems can arise even if the total funding is sufficient. Fraud is a problem in many sectors, but it is notoriously common in the construction sector. The purpose of project financial planning is to ensure that a robust plan is in place before the project starts, with adequate guarantees and contingency plans, and is needed to ensure that the plan is properly implemented throughout the life of the project.

**Question 0**

What can construction projects suffer from?

**Question 1**

What is the lowest price offer?

**Question 2**

When do cash flow problems exist?

**Question 3**

What economic problem is known to be common in the construction sector?

**Question 4**

What can a contingency plan suffer from?

**Question 5**

What is common in the economic planning sector?

**Question 6**

What is one reason why a labour problem occurs and cannot be funded?

**Question 7**

What guarantees that there is a solid cash flow before the project is implemented to ensure its completion?

**Question 8**

What happens when the builder does not ask for adequate safeguards?

**Text number 12**

Mortgage bankers, accountants and cost engineers are likely to be involved in drawing up the overall financial management plan for the construction project. The involvement of a mortgage banker is highly likely even for relatively small projects, as the owner's equity in the property is the most obvious source of funding for a construction project. Accountants will examine the expected cash flow over the life of the project and monitor payments throughout the process. Cost engineers and estimators use their expertise to ensure that labour and materials can be priced at an appropriate estimate. Cost overruns on public projects have occurred when the contractor has identified cost-increasing change orders or project modifications that are not competitively bid by other firms because they have already been eliminated from consideration after the initial bid.

**Question 0**

Who is likely to be involved in the preparation of the overall financial management plan for a construction project?

**Question 1**

Who is very likely to be present, even in small projects?

**Question 2**

Who will examine the expected cash flow during the project life cycle and monitor payments throughout the process?

**Question 3**

Who will use their expertise to relate the work and materials to a proper valuation?

**Question 4**

Cost overruns have occurred on government projects when the contractor has done what?

**Question 5**

What are mortgage bankers looking into the project?

**Question 6**

What is eliminated after the equity in the property?

**Question 7**

Proper assessments were done on a government project because what did the owner do?

**Question 8**

Who is likely to be present in the initial bid?

**Question 9**

What is the obvious source of cost engineers?

**Text number 13**

The project must comply with planning and building regulations. A project that does not comply with the rules does not benefit the owner. Some legal requirements are driven by malum in se considerations or a desire to prevent undeniably bad things - like bridge collapses or explosions. Other statutory requirements stem from malum prohibitum considerations, or things that are customary or expected, such as isolating businesses in a commercial district and isolating homes in a residential district. An attorney can seek modifications or exceptions to the law governing the land on which a building is constructed, either by arguing that the rule does not apply (the bridge structure will not cause a collapse), or that the practice is no longer needed (the acceptance of residential units has increased in the community).

**Question 0**

What must a project comply with?

**Question 1**

Who does not benefit from building a project that does not respect the rules?

**Question 2**

What are the aspects of malum in se?

**Question 3**

What are the aspects of malum prohibitum?

**Question 4**

Who can apply for changes or exceptions to the law on the land on which a building is being built?

**Question 5**

What must a lawyer follow?

**Question 6**

Who does not benefit when the project does not respect the residential area?

**Question 7**

Where do the exceptions come from that prevent bad things from happening?

**Question 8**

What is one way a lawyer tries to get a business district to change?

**Question 9**

How does custom or expectation influence a building before it is built?

**Text number 14**

A construction project is a complex web of contracts and other legal obligations, each of which must be carefully considered by all parties. A contract is an exchange of obligations between two or more parties, but it is not as simple as trying to persuade one party to agree to as much as possible for as little consideration as possible. The time element in construction means that delay costs money, and in bottleneck cases, delay can be very costly. Consequently, contracts must be drafted in such a way as to ensure that both parties are able to meet their obligations. Contracts that set clear expectations and clear routes to meet those expectations are much more likely to result in a smoothly running project, while poorly drafted contracts lead to confusion and breakdown.

**Question 0**

What is the complex web of contracts and other legal obligations?

**Question 1**

What is an exchange of obligations between two or more parties?

**Question 2**

What does the time element of construction mean?

**Question 3**

Contracts must be designed to ensure what?

**Question 4**

What leads to confusion and collapse?

**Question 5**

What is the network of projects and other legal exchanges?

**Question 6**

What is the time element of construction between two or more parties?

**Question 7**

When you have a party who will agree to a lot for a little, what happens to the cost?

**Question 8**

How should expectations be set to keep costs down?

**Question 9**

Where do bad time factors lead?

**Text number 15**

In addition, there are an increasing number of new forms of procurement involving relationship-based contracting, which emphasises the collaborative relationship between the client and the contractor and other stakeholders in the construction project. New forms include partnerships, such as public-private partnerships (PPPs) or private finance initiatives (PFIs), and consortia, such as "clean" or "project consortia" and "unclean" or "strategic" consortia. This focus on cooperation aims to alleviate many of the problems that often arise from the fierce competition and confrontation that exists in the construction sector.

**Question 0**

What new forms of procurement are increasingly common?

**Question 1**

What is PPP?

**Question 2**

What is PPP?

**Question 3**

The focus will be on how to alleviate many of the problems caused by the often fierce competition and confrontation in the construction sector.

**Question 4**

What is the focus on procurement aimed at preventing?

**Question 5**

What is the relationship between the funding initiatives?

**Question 6**

Who is the priority in the case of a private funding initiative?

**Question 7**

What is an example of a confrontation involving partnership?

**Question 8**

What forms of procurement are used in the construction sector?

**Text number 16**

This is the most common method of construction procurement and is well established and recognised. Under this arrangement, the architect or engineer acts as project coordinator. His/her role is to design the works, draw up the specifications and construction drawings, manage the contract, organise the tendering process and manage the works from start to finish. There is a direct contractual relationship between the architect's client and the main contractor. All subcontractors have a direct contractual relationship with the main contractor. The process continues until the building is ready for occupation.

**Question 0**

Who is the project coordinator for the most common construction contracts?

**Question 1**

which is responsible for designing the works, drawing up the technical specifications and construction drawings, managing the contract, organising the tendering procedure and managing the works from start to finish.

**Question 2**

Between whom are there direct contractual relations?

**Question 3**

With whom does the subcontractor have a direct contractual relationship?

**Question 4**

The procedure continues until what?

**Question 5**

What will continue until the building is established and recognised?

**Question 6**

What does the main contractor do in standard construction contracts?

**Question 7**

What three things are the role of the main contractor?

**Question 8**

How are the customer and the subcontractor connected?

**Question 9**

What is the relationship between the architect and the subcontractor?

**Text number 17**

The owner draws up a list of requirements for the project, which gives an overview of the project's objectives. Several D&B contractors present different ideas on how to achieve these objectives. The owner selects the ideas he likes best and hires the appropriate contractor. Often it is not just one contractor, but a consortium of several contractors. Once the contractors are hired, they start building the first phase of the project. While they are building Phase 1, they are designing Phase 2. This is the opposite of a design-bid-build contract, where the owner designs the project completely, bids it out and then completes it.

**Question 0**

Who draws up a list of requirements for the project that gives an overview of the project's objectives?

**Question 1**

Who has different ideas on how to achieve the objectives?

**Question 2**

Who selects and hires the best ideas and the right contractors?

**Question 3**

Who usually works together?

**Question 4**

What happens when Phase 1 is built?

**Question 5**

What will the contractor deliver so that everyone can see the project objectives?

**Question 6**

What does the owner produce to show how the objectives are being met?

**Question 7**

What do D&B contractors do before hiring a contractor?

**Question 8**

Who is usually hired for a design and tendering contract?

**Question 9**

What happens in a phase 2 agreement?

**Text number 18**

Before the foundation can be dug, contractors usually have to check and mark the existing water pipes, either by the water company itself or by a company specialising in such services. This reduces the likelihood of damage to existing electricity, water, sewerage, telephone and cable networks, which could cause outages and potentially dangerous situations. During the construction of the building, the building will be periodically inspected by the municipal building inspector to ensure that the construction is in compliance with the approved plans and local building codes. Once the construction work is completed and the final inspection has been passed, the occupancy permit can be issued.

**Question 0**

Who is responsible for checking and marking existing water pipes?

**Question 1**

Marking existing power lines reduces the likelihood of what?

**Question 2**

What are the existing facilities?

**Question 3**

Who will periodically inspect the building to ensure that it is being built in accordance with approved plans and local building regulations?

**Question 4**

What will be granted once the construction is complete and the final inspection has been passed?

**Question 5**

What happens before digging the foundation and passing the final inspection?

**Question 6**

What do building inspectors do about water pipes?

**Question 7**

What damage does digging foundations prevent?

**Question 8**

What do contractors ensure during the construction of a building?

**Question 9**

What do contractors check during the construction of a building?

**Text number 19**

According to Census Bureau statistics, the annual income of the sector in the US in 2014 was around $960 billion, of which $680 billion was private (split evenly between residential and non-residential) and the rest public. In 2005, there were approximately 667 000 firms employing 1 million contractors (200 000 general contractors, 38 000 heavy contractors and 432 000 specialty contractors); the average contractor employed fewer than 10 workers. In April 2013, there were an estimated 5.8 million workers in the sector as a whole, with an unemployment rate of 13.2%. In 2011, there were around 828 000 women working in the construction sector in the US.

**Question 0**

What is the annual turnover of the construction industry in 2014?

**Question 1**

How much of the income is private?

**Question 2**

How many companies were there in 2005?

**Question 3**

How many workers did the average contractor hire?

**Question 4**

How many women worked in the construction sector in 2011?

**Question 5**

What was the unemployment rate in 2011?

**Question 6**

What was the annual income of 1 million contractors in 2014?

**Question 7**

How many people were employed by the state in 2005?

**Question 8**

How many companies were there in 2011?

**Question 9**

How many contractors worked in the construction industry in the US in 2011?

**Text number 20**

The 2010 wage survey revealed pay differentials between jobs, sectors and establishments in the construction and built environment sectors. The results showed that average wages are higher in areas of particularly strong growth in the construction industry, such as the Middle East, than in the UK, for example. The average salary for a construction professional in the Middle East across all sectors, all jobs and all levels of experience is £42,090, compared to £26,719 in the UK. However, this trend is not necessarily due to the availability of more affluent jobs, as architects in the Middle East with at least 14 years' experience earn an average of £43 389 per year, compared to £40 000 in the UK. Some construction workers in the US and Canada have earned more than $100,000 a year, depending on their occupation.

**Question 0**

What is the average construction salary in the Middle East?

**Question 1**

What is the average construction salary in the UK?

**Question 2**

Where have some workers earned more than $100,000?

**Question 3**

What was the average earnings of a professional in 2010?

**Question 4**

What do construction workers with 14 years' experience earn in the Middle East?

**Question 5**

What do architects in the US/Canada earn each year?

**Question 6**

What do job roles and experience levels reflect in the results?

**Question 7**

What is not due to the average earnings of a professional?

**Text number 21**

Construction is one of the most dangerous occupations in the world, killing more people than any other sector in both the US and the European Union. In 2009, the number of fatal accidents at work among construction workers in the US was almost three times higher than among all workers. Falls are one of the most common causes of fatal and non-fatal accidents among construction workers. Proper safety equipment, such as harnesses and guardrails, and procedures such as ladder anchoring and scaffolding inspection can reduce the risk of accidents in the construction industry. Other major causes of fatalities in the construction sector include electric shocks, transport accidents and trench collapses.

**Question 0**

What is one of the most dangerous professions in the world?

**Question 1**

What is the most common cause of injury on a construction site?

**Question 2**

What are the other main causes of death?

**Question 3**

What can be done to reduce the risk of accidents in the construction sector?

**Question 4**

What is one of the most common occupations in the world?

**Question 5**

What was the number of fatal accidents involving construction workers in the EU in 2009?

**Question 6**

What is one thing that can prevent non-fatal injuries?

**Question 7**

What policies can be put in place to reduce the number of accidents among construction workers in the EU?

**Question 8**

What are the other common causes of fatalities in hazardous occupations worldwide?

**Document number 461**

**Text number 0**

Private schools, also known as independent schools, non-governmental schools or non-state schools, are not run by local, state or national governments; they therefore retain the right to choose their pupils and are funded in whole or in part by charging their pupils tuition fees rather than relying on compulsory taxation through public (state) funding; in some private schools pupils may receive a scholarship which makes the cost cheaper depending on the talent the pupil may have (e.g.e.g. sports scholarship, arts scholarship, academic scholarship), financial need or possible tax credit scholarships.

**Question 0**

What is the other name for private schools besides non-governmental and state schools?

**Question 1**

Besides sport and art, what is a kind of talent grant?

**Question 2**

How to finance private schools instead of taxation?

**Question 3**

What rights do private schools have that public schools do not?

**Question 4**

What is another name for a public school?

**Question 5**

How are private schools financed by taxation?

**Question 6**

What can help a student get a scholarship to a public school?

**Question 7**

What are two reasons why a student could be eligible for a scholarship to a public school?

**Question 8**

What should public schools do to keep talented students?

**Text number 1**

In the UK and several other Commonwealth countries, such as Australia and Canada, the term is generally used only for primary and secondary education; it is almost never used for universities and other higher education institutions. In North America, private education covers the whole spectrum of educational activity from pre-school to tertiary education. Annual tuition fees in K-12 schools range from zero in so-called "tuition-free" schools to over $45 000 in many New England preparatory schools.

**Question 0**

What is the annual cost of some major prep schools in New England?

**Question 1**

What are the private schools that do not charge tuition fees?

**Question 2**

In which countries, Canada and the UK, are universities not usually called private schools?

**Question 3**

In which region is the term "private schools" used for universities?

**Question 4**

How much does it cost per year to study at a British university?

**Question 5**

Where is the term "private school" limited in the United States?

**Question 6**

When is the term private school never used in the United States?

**Question 7**

Why are schools not charging tuition fees in Australia called?

**Question 8**

What is the term used in the UK, Australia and Canada when referring to universities?

**Text number 2**

Secondary schools include schools offering grades 7 to 12 (twelfth year known as lower sixth) and 13th year (upper sixth). This category includes university preparatory schools, boarding schools and day schools. Tuition fees in private upper secondary schools vary from school to school and depend on many factors, such as the location of the school, parents' willingness to pay, peer tuition fees and school funding. According to schools, high tuition fees are used to pay higher salaries for the best teachers and also to provide rich learning environments such as low student-teacher ratios, small class sizes and facilities such as libraries, science labs and computers. Some private schools are boarding schools, and many military academies are also privately owned or managed.

**Question 0**

What is the second term for the 12th year of education?

**Question 1**

What is another term used since 13?

**Question 2**

What is another term for university preparatory schools?

**Question 3**

Besides location, donations and parents' willingness to pay, what factors influence tuition fees in private schools?

**Question 4**

Who gets higher salaries in private schools that charge higher tuition fees?

**Question 5**

What is another term used for a library?

**Question 6**

What is another term used for a science laboratory?

**Question 7**

What are tuition fees used for in military academies?

**Question 8**

What benefits are available when you are enrolled at a military academy?

**Text number 3**

Religiously affiliated and denominational schools form a sub-category of private schools. In some such schools, religious education is taught alongside the usual academic subjects, in order to familiarise pupils with the beliefs and traditions of their own religion. Others use religion as a more general term to describe what the founders of the school base their religion on, but still maintain a fine distinction between academics and religion. They include church schools, a term often used for Roman Catholic schools. Other religious groups represented in private K-12 education include Protestants, Jews, Muslims and Orthodox Christians.

**Question 0**

To which religious schools does the term "parochial schools" usually refer?

**Question 1**

Which religious group runs private schools in particular, alongside Muslims, Jews and Protestant Christians?

**Question 2**

What kind of teaching is sometimes given in religious schools in addition to the secular curriculum?

**Question 3**

Which category of schools maintains the boundary between academia and religion?

**Question 4**

What do all Roman Catholic schools teach?

**Question 5**

Why were Roman Catholic schools founded?

**Question 6**

What method do Muslim-run schools use in their curricula?

**Text number 4**

Private schools may be favoured in Australia for a number of reasons: prestige and 'old school' social status, better quality physical infrastructure and more facilities (e.g. playing fields, swimming pools, etc.), higher paid teachers and/or the belief that private schools provide better quality education. Some schools offer the removal of supposed distractions of co-education, boarding schools, or stricter discipline based on the right to expulsion, which is not readily available in government schools. In Australian private schools, student uniforms tend to be stricter and more formal than in state schools - for example, a compulsory blazer. Private schools in Australia are always more expensive than their public counterparts[1].

**Question 0**

What power do Australian private schools have at their disposal that public schools usually don't?

**Question 1**

What is an example of a uniform typically found in Australian private schools?

**Question 2**

What is the price comparison between private and public schools in Australia?

**Question 3**

What is the status of public schooling in Australia?

**Question 4**

How well are teachers paid in Australian public schools?

**Question 5**

What kind of education is provided in Australian public schools?

**Question 6**

What means do they use to maintain discipline in public schools?

**Question 7**

Which part of your school uniform do you need to wear if you go to public school in Australia?

**Text number 5**

While most are non-affiliated, some of the best-known independent schools also belong to large, long-established religious organisations such as the Anglican Church, the Unitarian Church and the Presbyterian Church, but in most cases they do not require their pupils to have a religious affiliation. These schools are generally considered to be 'elite' schools. Many 'language schools' also fall into this category. They tend to be expensive schools, usually upper-class and traditional. Some Catholic schools also fall into this category, for example St Joseph's College, Gregory Terrace, St Ignatius' College, Riverview, St Gregory's College, Campbelltown, St Aloysius' College (Sydney) and St Joseph's College, Hunters Hill, as well as Loreto Kirribilli, Monte Sant Angelo Mercy College, St Ursula's College and Loreto Normanhurst for girls.

**Question 0**

Apart from the Anglican Church and the Uniting Church, which religious community runs private schools in Australia?

**Question 1**

Which denomination runs St Joseph's College?

**Question 2**

Where is St Aloysius' College located?

**Question 3**

Who visits Loreto Normanhurst?

**Question 4**

Which denomination requires that students must also be members of a founding church?

**Question 5**

Which category do all Catholic schools fall into?

**Question 6**

Where is St. Gregory's College located?

**Question 7**

Which three churches have colleges in Sydney?

**Question 8**

What do all language schools require of their students in order for them to participate?

**Text number 6**

The right to establish private schools in Germany is enshrined in Article 7(4) of the Basic Law and cannot be suspended, even during a state of emergency. Nor can these rights be abolished. This unusual protection of private schools was put in place to protect them from another Gleichschaltung or similar event in the future. Yet they are less common than in many other countries. Overall, between 1992 and 2008, the proportion of pupils in such schools in Germany increased from 6.1% to 7.8% (including 0.5% to 6.1% in the former GDR). The share of pupils in private upper secondary schools was 11.1%.

**Question 0**

Which article of the Grundgesetz gives the right to establish private schools?

**Question 1**

What event forced the protection of German private schools?

**Question 2**

What percentage of German pupils attended private school in 2008?

**Question 3**

What proportion of Germans attended private upper secondary schools in 2008?

**Question 4**

What percentage of pupils in East Germany attended private schools in 1992?

**Question 5**

Which article gives Gleichschaltung the right to set up private schools?

**Question 6**

When can the right to set up private schools be taken away in other countries?

**Question 7**

Why was protection for private schools introduced in 1992?

**Question 8**

What percentage of pupils in Grundgesetz went to private school in 2008?

**Question 9**

What percentage of pupils attended private schools in the Grundgesetz in 1992?

**Text number 7**

Ersatzschulen are ordinary primary or secondary schools run by individuals, private organisations or religious groups. These schools offer the same type of diplomas as public schools. Ersatzschulen cannot operate completely outside the state's regulatory framework. Ersatzschulen must have at least the same education and at least the same salary as public school teachers, Ersatzschulen must have at least the same academic standards as public schools, and Article 7(4) of the Basic Law also prohibits segregation of pupils according to parental wealth (the so-called Sonderungsverbot). As a result, most Ersatzschulen have very low tuition fees and/or offer scholarships compared to most other Western European countries. However, it is not possible to finance these schools with such low tuition fees, which is why all German Ersatzschulen are also financed from public funds. Public funds can account for up to 100 % of staff costs. Nevertheless, there have been private schools in Germany in the past which have become insolvent.

**Question 0**

What is the German term for segregating pupils on the basis of their parents' wealth?

**Question 1**

What do Germans call private schools?

**Question 2**

How do tuition fees in German private schools compare with private schools in other Western European countries?

**Question 3**

Who is in charge of the Sonderungsverbot?

**Question 4**

What kind of school is Sonderungsverbot?

**Question 5**

What kind of diploma is awarded when graduating from Sonderungsverbot?

**Question 6**

What does Sonderungsverbot not have when it tries to work without regulation?

**Question 7**

What is the tuition fee if you enrol in the Sonderungsverbot programme?

**Text number 8**

Ergänzungsschulen are secondary or post-secondary schools run by private individuals, private organisations or, rarely, religious groups, which provide education that is not available in public schools. Most of these schools are vocational schools. However, these vocational schools are not part of the German dual education system. Ergänzungsschule are free to operate outside the state regulation and are fully financed by charging tuition fees to students.

**Question 0**

What is the name of a private upper secondary school in Germany?

**Question 1**

What kind of schools are most complementzungsschulen?

**Question 2**

How are supplementzungsschulen financed?

**Question 3**

What groups besides individuals and organisations sometimes run complementzungsschulen?

**Question 4**

What are public schools called in Germany?

**Question 5**

Where do most public schools fall short?

**Question 6**

Outside which countries do public schools operate in Germany?

**Question 7**

How are public schools funded?

**Question 8**

Which group rarely runs a public school?

**Text number 9**

In India, private schools are called independent schools, but because some private schools receive financial support from the government, they can be subsidised or unsubsidised. Strictly speaking, a private school is therefore an unsubsidised independent school. This definition only takes into account the receipt of financial support, not the purchase of land with government subsidies. Both the Union and state governments have the power to regulate schools, as education is included in the list of coextensive legislative branches of the Constitution. The practice has been that the Union Government has given broad policy guidelines while the States have framed their own rules and regulations for the administration of the sector. This has resulted, inter alia, in 30 different examination boards or academic authorities conducting examinations for school leaving certificates. The CBSE and CISCE, NENBSE and NENBSE are major examination boards operating in several states.

**Question 0**

What is the term for an Indian private school?

**Question 1**

What is a major examination board in several Indian states, along with CISCE and NENBSE?

**Question 2**

How many examination boards are there in India?

**Question 3**

Which body in India gives policy advice to schools?

**Question 4**

What are state schools called in India?

**Question 5**

What are the two categories of government school in India?

**Question 6**

What do CBSE and CISCe both have the power to regulate?

**Question 7**

How many independent schools are there in India?

**Question 8**

Which certificate does the legislator examine?

**Text number 10**

According to the law, only non-profit foundations and associations can run schools in India. They have to meet certain infrastructure and human resource criteria to be recognised by the government (a kind of licence). Critics of the system point out that this leads to corruption on the part of school inspectors who enforce the rules, and a decline in the number of schools in a country with the world's largest adult illiteracy population. Although official data do not reveal the true extent of private schooling in the country, several studies have reported the unpopularity of state schools and an increase in the number of private schools. The Annual Status of Education Report (ASER), which assesses learning achievement in rural India, has reported poorer academic performance in government schools than in private schools. A key difference between government and private schools is that in private schools the medium of instruction is English, while in government schools it is the local language.

**Question 0**

What other non-profit organisations are allowed to run schools in India besides trusts?

**Question 1**

Which country has the most illiterate adults in the world?

**Question 2**

What is the full name of ASER?

**Question 3**

What is the purpose of ASER?

**Question 4**

What language is taught in private schools?

**Question 5**

Who can legally teach English in India?

**Question 6**

What do state schools need to do to teach English?

**Question 7**

How are the number of government schools in rural India declining?

**Question 8**

What did the ASER report show about people's attitudes to private schools?

**Question 9**

What do critics say poor school performance leads to?

**Text number 11**

In Ireland, private schools (scoil phríobháideach) are unusual because the state pays a certain number of teachers' salaries. If a school wants to hire extra teachers, they are paid for by school fees, which in Ireland are generally relatively low compared to the rest of the world. However, private schools are subject to limited evaluation by the state, which has to ensure that children receive a certain minimum education. Private schools in Ireland still have to aim for qualifications such as the Junior Certificate and the Leaving Certificate. Many private schools in Ireland also operate as boarding schools. The average annual fee in most schools is around €5 000, but some of these schools also offer a boarding school, where fees can reach up to €25 000 per year. The fee-paying schools are usually run by a religious organisation, such as the Society of Jesus or the Congregation of the Christian Brothers.

**Question 0**

What is the Irish term for private schools?

**Question 1**

How are Irish private schools different from most?

**Question 2**

What are the typical annual costs of a private school in Ireland?

**Question 3**

Apart from the Christian Brethren Congregation, what is a major religious group that runs fee-paying schools in Ireland?

**Question 4**

How high can the fees for an Irish boarding school go?

**Question 5**

What is the Irish term for school fees?

**Question 6**

How do private schools in the rest of the world differ from Ireland?

**Question 7**

How do school fees compare in other parts of the world compared to Ireland?

**Question 8**

What certifications should private schools worldwide aim for?

**Question 9**

What is the average private school fee worldwide?

**Text number 12**

After Malaysian independence in 1957, the government ordered all schools to hand over their assets and merge into the national school system. This caused uproar among the Chinese, and a compromise was reached on the schools, which were to become 'national type' schools. Under such a system, the government would only be responsible for the schools' curriculum and teaching staff, but the land would still belong to the schools. Chinese primary schools were allowed to retain Chinese as the language of instruction, but Chinese secondary schools had to become English-medium schools. More than 60 schools were converted into national schools.

**Question 0**

In what year did Malaysia become independent?

**Question 1**

What language is used in Malaysian Chinese primary schools?

**Question 2**

What language is used in Chinese high schools in Malaysia?

**Question 3**

What is the name of Malaysia's post-independence state school system?

**Question 4**

How many Chinese schools became national schools as a result of the compromise?

**Question 5**

In what year did China set up English-language schools?

**Question 6**

How many people protested against the school assimilation programme in Malaysia?

**Question 7**

What happened to schools after China gained independence in 1957?

**Question 8**

What kind of schools would be used in China as a compromise after Chinese independence?

**Question 9**

Who owned the land in China after the school compromise?

**Text number 13**

Schools in the second category are run and partly or fully funded by private individuals, private organisations and religious groups. Schools that accept state funds are called 'subsidised' schools. Private 'non-assisted' schools are fully funded by private entities. The level and quality of education is quite high. Technically they are classified as private schools, but many of them have the name "public school" attached, for example Galaxy Public School in Kathmandu. Most middle-class families send their children to such schools, which can be located in their own town or far away, such as boarding schools. The medium of instruction is English, but Nepali and/or the official language of the state is also taught as a compulsory subject. Pre-school education is mostly limited to organised kindergartens in the suburbs.

**Question 0**

What is the term for schools that receive state aid?

**Question 1**

How do "non-assisted" schools differ from "assisted" schools?

**Question 2**

Where is Galaxy Public School located?

**Question 3**

What is the primary language of instruction in Nepali private schools?

**Question 4**

What language is often taught in Nepalese private schools in addition to English?

**Question 5**

What kind of family sends their child to pre-school?

**Question 6**

What is the standard of living for most families in Kathmandu?

**Question 7**

What name is typically associated with a pre-school?

**Question 8**

What is the name of boarding schools teaching English?

**Question 9**

Which group fully funds the pre-school?

**Text number 14**

In April 2014, there were 88 private schools in New Zealand, with around 28 000 students, or 3.7% of the total student population. The number of private schools has been declining since the mid-1970s, as many private schools have become state schools, mostly due to financial difficulties resulting from changes in pupil numbers and/or the economy. The state-integrated schools retain the specific character of a private school and receive state funds in return for having to operate as a state school, i.e. they must teach the state curriculum, employ registered teachers and cannot charge tuition fees (they can continue to charge "participation fees" for the maintenance of private school land and buildings). The main decline in the number of private schools occurred between 1979 and 1984, when the country's then Catholic private school system was merged. As a result, New Zealand's private schools are now largely confined to the major cities (Auckland, Hamilton, Wellington and Christchurch) and narrow markets.

**Question 0**

How many private schools were there in New Zealand in April 2014?

**Question 1**

How many New Zealand students were attending private school in April 2014?

**Question 2**

What percentage of New Zealand students were attending private school in April 2014?

**Question 3**

Which religion schools were integrated into New Zealand public schools between 1979 and 1984?

**Question 4**

Which city is one of the largest in New Zealand, along with Hamilton, Wellington and Christchurch?

**Question 5**

How many private schools were there in New Zealand in 1970?

**Question 6**

How many pupils were in private school in 1979?

**Question 7**

What proportion of students attended private schools in 1984?

**Question 8**

What has happened to the number of private schools since 2014?

**Question 9**

Why have private schools been in decline since 2014?

**Text number 15**

Private schools are often Anglican, such as King's College and Diocesan School for Girls in Auckland, St Paul's Collegiate School in Hamilton, St Peter's School in Cambridge, Samuel Marsden Collegiate School in Wellington, and Christ's College and St Margaret's College in Christchurch; or Presbyterian, such as Saint Kentigern College and St Cuthbert's College in Auckland, Scots College and Queen Margaret College in Wellington, and St Andrew's College and Rangi Ruru Girls' School in Christchurch. Academic Colleges Group is a newly established group of private schools operating as a business with schools across Auckland, including ACG Senior College in the Auckland CBD, ACG Parnell College in Parnell and the international school ACG New Zealand International College. There are three private schools in Wanganui (including a secondary school, St Dominic's College) run by a Catholic schismatic group, the Society of St Pius X.

**Question 0**

To which denomination does the Auckland Diocesan School for Girls belong?

**Question 1**

Where is Samuel Marsden Collegiate School located?

**Question 2**

Which denomination is associated with Saint Kentigern College?

**Question 3**

In which city is Rangi Ruru Girls' School located?

**Question 4**

Which group runs St Dominic's College in Wanganui?

**Question 5**

How is St Andrew's College run?

**Question 6**

What does Academic Colleges Group do in Wanganui?

**Question 7**

Which Catholic association in Wanganui is part of the Academic Colleges Group?

**Question 8**

Which denomination do the schools run by the Academic Colleges Group belong to?

**Question 9**

How many affiliates are linked to ACG New Zealand International College?

**Text number 16**

In the Philippines, the private sector has been a major provider of education services, accounting for about 7.5% of primary school pupils, 32% of secondary school pupils and about 80% of tertiary students. Private schools have proven to be an efficient use of resources. Costs per unit are generally lower in private schools than in public schools. The situation is more pronounced in tertiary education. Government regulations in recent years have given more flexibility and autonomy to private education, notably by lifting the moratorium on applications for new courses, new schools and conversions, liberalising the tuition fee policy for private schools, replacing third and fourth year honours education with English, mathematics and science education of the school's choice, and by issuing a revised Manual of Regulations for Private Schools in August 1992.

**Question 0**

What proportion of Filipino primary school pupils attend private schools?

**Question 1**

What percentage of high school students in the Philippines attend private schools?

**Question 2**

What proportion of higher education in the Philippines is provided in private schools?

**Question 3**

In which month and year was the revised Private School Regulations Manual published?

**Question 4**

Which subject, alongside English and maths, replaced values education for fourth-year students?

**Question 5**

What percentage of pupils in the Philippines attend public primary school?

**Question 6**

What is lower in public schools than in private schools?

**Question 7**

What have public schools recently received from public authorities?

**Question 8**

When did the Philippines start teaching English in primary schools?

**Text number 17**

The government's Education Service Contract scheme provides financial support for tuition and other school fees for students who are turned away from public high schools because of matriculation exams. Tuition assistance is for students enrolled in priority courses in post-secondary and non-degree programs, including vocational and technical courses. Private Student Financial Aid is for disadvantaged but deserving high school graduates who wish to pursue higher education or technical education at private colleges and universities.

**Question 0**

What is the name of the scheme that provides tuition and fee assistance to students who are studying for a higher education entrance qualification?

**Question 1**

What scholarships are available for students attending priority courses?

**Question 2**

What support is available for disadvantaged students who want to study at a private university?

**Question 3**

Why are students being turned away from non-degree programmes?

**Question 4**

How does Tuition Fee Support help upper secondary school students?

**Question 5**

How will financial support for private students help current high school students who have been rejected?

**Question 6**

Which programme provides financial support for tuition and fees for higher education or technical training?

**Question 7**

What does the government offer to students turned away from priority courses?

**Text number 18**

Some of South Africa's oldest schools are private church schools, founded by missionaries in the early 19th century. The private sector has grown ever since. After the abolition of apartheid, South Africa's laws on private education changed significantly. The 1996 South African Schools Act recognises two categories of schools: 'public' (state-controlled) and 'independent' (which includes traditional private schools and privately-run schools).

**Question 0**

Which South African law recognised the two types of schools?

**Question 1**

In what year was the South African Schools Act passed?

**Question 2**

Which type of school was recognised in the South African School Act alongside public schools?

**Question 3**

Which schools in South Africa are classified as independent alongside private schools?

**Question 4**

In which century did missionaries establish church schools in South Africa?

**Question 5**

In which century was apartheid abolished?

**Question 6**

What did the missionaries achieve in 1996?

**Question 7**

How did African independence change the laws governing the entry of missionaries into Africa?

**Question 8**

In which century was South Africa founded as a state?

**Question 9**

What has happened to the public education sector under government control?

**Text number 19**

In the final years of the apartheid era, parents in white state schools were given the option of switching to a "semi-private" school format, known as the C model, and many of these schools changed their admissions policies to accept children of other races. After the transition to democracy, the legal form of the C model was abolished, but the term is still used to describe state schools that were previously reserved for white children. These schools generally produce better academic results than state schools previously reserved for other racial groups. Former Form C schools are not private schools because they are state-run. All South African schools (both independent and public) have the right to impose compulsory school fees, and former Model C schools tend to charge much higher fees than other public schools.

**Question 0**

After apartheid, what kind of schools are called Model C schools?

**Question 1**

How do the academic results of former Model C schools compare with other schools?

**Question 2**

How do the fees of former Model C schools compare with those of other schools?

**Question 3**

Which school option were parents of minority children given the opportunity to switch to?

**Question 4**

What was abolished during apartheid?

**Question 5**

What is the term used for schools that admit only black children?

**Question 6**

What results are achieved in schools that admit only black children?

**Question 7**

What do only white children have to pay to go to school?

**Text number 20**

In Sweden, pupils are free to choose a private school, and private schools are paid the same fees as municipal schools. In 2008, more than 10% of Swedish pupils attended private schools. Sweden is internationally renowned for this innovative school voucher scheme, which allows Swedish pupils to choose the school of their choice. For example, the largest school chain, Kunskapsskolan ("Knowledge School"), offers 30 schools and a web-based environment, has 700 employees and nearly 10 000 pupils. The Swedish system has been recommended to Barack Obama.

**Question 0**

What proportion of Swedish pupils attended private schools in 2008?

**Question 1**

How many students attend Kunskapsskolan schools?

**Question 2**

How many people work in Kunskapsskolan schools?

**Question 3**

What is the English translation of Kunskapsskolan?

**Question 4**

What kind of school model is important in Sweden?

**Question 5**

How many Swedish pupils attended public school in 2008?

**Question 6**

How many people from Sweden have worked with Barack Obama?

**Question 7**

What is the Swedish word for school vouchers?

**Question 8**

What opportunity did Barack Obama support for Swedish children?

**Question 9**

How many school vouchers did Sweden issue in 2008?

**Text number 21**

Private schools are usually preferred to be called independent schools because they can operate freely outside state and local control. Some of these schools are also known as public schools. In the UK, preparatory schools prepare pupils up to the age of 13 for public schools. The name 'public school' is based on the fact that schools were open to pupils from anywhere, not just from a particular locality, and that pupils could be of any religion or profession. According to The Good Schools Guide, around 9% of children in the UK study in fee-paying schools at GSCE level and 13% at A level. Many independent schools are single-sex (although this is increasingly rare). Fees range from less than £3 000 to £21 000 or more per year for day pupils and rise to over £27 000 per year for boarders. For more information on Scotland, see "Meeting the Cost".

**Question 0**

Up to what age do pupils in the UK attend preparatory schools?

**Question 1**

Which preparatory schools prepare British children for school?

**Question 2**

What percentage of British children attend fee-paying schools at GSCE level?

**Question 3**

What percentage of British students attend A-level fee-paying schools?

**Question 4**

What is the upper limit for annual fees for non-resident pupils in British public schools?

**Question 5**

Who do Scottish preparatory schools prepare for public schools?

**Question 6**

What percentage of children in education in Scotland are in independent schools?

**Question 7**

At what level are 13% of children in independent schools in Scotland?

**Question 8**

What type of school is declining in Scotland?

**Question 9**

What is the highest price a pupil would pay to go to school in Scotland?

**Text number 22**

In many parts of the United States, local families organized a wave of private "Christian academies" in many parts of the United States after the landmark 1954 ruling in Brown v. Board of Education of Topeka, which called for the abolition of racial segregation in US schools "by any means necessary". In much of the southern part of the US, many white students moved to academies, while public schools, in turn, became more focused on African-American students (see List of private schools in Mississippi). Since the 1970s, many of these "segregated academies" have closed, although some continue to operate[citation needed].

**Question 0**

Which court case desegregated schools in the US?

**Question 1**

What is a derogatory term for the Christian academies that were created as a result of the desegregation of schools?

**Question 2**

In which part of the United States did many students transfer to Christian academies during desegregation?

**Question 3**

What was the preferred race of students attending Christian academies after the Brown decision?

**Question 4**

The desegregation of schools in the United States led to an increase in the number of ethnic students in public schools.

**Question 5**

Which case abolished school segregation in 1970?

**Question 6**

How quickly were the Christian academies to be separated?

**Question 7**

What did local families organise before the Supreme Court hearing?

**Question 8**

What kind of curriculum did public schools focus on for white students?

**Question 9**

What was the increase in the number of pupils of which race in public schools before 1954?

**Text number 23**

Funding for private schools usually comes from pupils' tuition fees, donations, scholarship and voucher funds, and donations and grants from religious organisations or individuals. State funding for religious schools is either limited or possibly prohibited depending on how courts interpret the Establishment Clause of the First Amendment or the Blaine Amendments of individual states. Non-religious private schools could, in theory, receive such funding with no problem because they would prefer independent control over the admission and course content of their students rather than the public funding they could receive under the charter.

**Question 0**

Where does funding for private schools come from, apart from tuition fees, scholarships, vouchers, donations and grants?

**Question 1**

Which amendment to the US Constitution regulates government funding of religious schools?

**Question 2**

Which state constitutional amendments refer to government funding of religious schools?

**Question 3**

What status would granting private non-denominational schools in the United States have in terms of access to public funds?

**Question 4**

Which body would decide that funding the content of the course is prohibited?

**Question 5**

What applies to funding for course content?

**Question 6**

Why would the courts restrict funding for course content?

**Question 7**

How can individuals interpret whether funding the content of a course is prohibited?

**Question 8**

How is the course content delivered to a private school?

**Text number 24**

Educators, legislators and parents have been debating private schooling in the US since compulsory education was introduced in Massachusetts in 1852. Supreme Court precedent seems to favour educational choice as long as states can set standards for educational outcomes. Supreme Court case law includes Runyon v. McCrary, 427 U.S. 160 (1976); Wisconsin v. Yoder, 406 U.S. 205 (1972); Pierce v. Society of Sisters, 268 U.S. 510 (1925); Meyer v. Nebraska, 262 U.S. 390 (1923).

**Question 0**

Which was the first US state to have compulsory education?

**Question 1**

What year did Massachusetts first require children to attend school?

**Question 2**

What year did the Supreme Court rule in Wisconsin v. Yoder?

**Question 3**

What is the reference in Pierce v. Society of Sisters?

**Question 4**

Who was the opposing party in the Runyon case?

**Question 5**

What became mandatory in Massachusetts in 1976?

**Question 6**

Which was the first country to set education standards?

**Question 7**

Educators will support educational choice as long as what happens?

**Question 8**

Who was involved in the Wisconsin case in 1976?

**Question 9**

Which other person was involved in the Runyon case in 1972?

**Text number 25**

In 2012, high-quality private schools in the US charged substantial tuition fees, almost $40 000 a year for day schools in New York and almost $50 000 for boarding schools. However, tuition fees did not cover operating costs, especially for boarding schools. Leading schools, such as Groton School, had substantial endowments of hundreds of millions of dollars, supplemented by fundraising. The boarding schools that have established a reputation for excellence in the United States have a student body from all over the country and even the world, with a list of applicants well beyond their capacity.

**Question 0**

How much did a day school in New York cost per year in 2012?

**Question 1**

What should a parent pay to send their child to boarding school in 2012?

**Question 2**

Which major private school has a donation of several hundred million dollars?

**Question 3**

How do boarding schools cover their operating costs beyond donations and tuition fees?

**Question 4**

How much did Groton School charge per pupil in 2012?

**Question 5**

Where do the majority of Groton School students come from?

**Question 6**

How many applicants does Groton School receive each year?

**Question 7**

In which city is Groton School located?

**Question 8**

What were the operating costs of Groton School in 2012?

**Document number 462**

**Text number 0**

Originally founded by the Massachusetts legislature and named shortly after John Harvard (its first benefactor), Harvard is the oldest institution of higher education in the United States, and Harvard Corporation (officially the President and members of Harvard College) is its first founding company. Although the College was never officially affiliated with any denomination, it trained primarily Congregationalist and Unitarian ministers. Its curriculum and student body gradually became more secular during the 1700s, and by the 19th century Harvard had emerged as a key cultural institution for Boston's elite. After the American Civil War, the long tenure of President Charles W. Eliot (1869-1909) transformed the University and its associated professional schools into a modern research university; Harvard was a founding member of the Association of American Universities in 1900. James Bryant Conant led the University through the Great Depression and World War II, and after the war began to reform the curriculum and liberalize admissions. The undergraduate college became co-educational after merging with Radcliffe College in 1977.

**Question 0**

Who is the school named after?

**Question 1**

When did the undergraduate programme become a joint degree programme?

**Question 2**

What was the name of a leader during the Great Depression and the Second World War?

**Question 3**

Which organisation was founded by Harvard in 1900?

**Question 4**

Which university president transformed it into a modern research university?

**Question 5**

What difference does Radcliffe College make among universities?

**Question 6**

Who went to Radcliffe and trained there as students in its early days?

**Question 7**

When was the Radcliffe curriculum secularised?

**Question 8**

What had Radcliffe become in the 19th century?

**Question 9**

Who served as President of Radcliffe from 1869 to 1909?

**Text number 1**

Harvard is a large, highly populated research university. The nominal cost of tuition is high, but the university's large endowment allows it to offer generous financial aid packages. Harvard has several art, culture and science museums, as well as the Harvard Library, the world's largest academic and private library system, with 79 individual libraries holding over 18 million volumes. Harvard alumni include eight US presidents, several foreign heads of state, 62 billionaires, 335 Rhodes Scholars and 242 Marshall Scholars. To date, some 150 Nobel laureates, 18 Fields Medallists and 13 Turing Prize winners have been Harvard students, faculty or staff.

**Question 0**

What is the largest academic and private library system in the world?

**Question 1**

How many individual libraries make up the main school library?

**Question 2**

How many volumes are there in the library?

**Question 3**

How many US presidents are alumni of the school?

**Question 4**

How many Nobel Prize winners are among the school's alumni?

**Question 5**

What is the cost of living near Harvard?

**Question 6**

Where can tourists go when visiting Cambridge?

**Question 7**

How many public libraries are there in Cambridge?

**Question 8**

How many US presidents campaigned in Cambridge?

**Question 9**

How many billionaires now live in Cambridge?

**Text number 2**

The university is organised into eleven separate academic units - ten faculties and the Radcliffe Institute for Advanced Study - with campuses across the Boston metropolitan area: its 209-acre (85 ha) main campus is located at Harvard Yard in Cambridge, about 5 km northwest of Boston; the business school and athletic facilities, including Harvard Stadium, are located across the Charles River in Boston's Allston neighborhood; and the medical, dental, and public health schools are in the Longwood Medical District. Harvard's $37.6 billion endowment is the largest of any academic institution.

**Question 0**

In which major city in the United States is the university located?

**Question 1**

What is the size of the school's endowment?

**Question 2**

Which river is near the school?

**Question 3**

How many academic units are there in the school?

**Question 4**

What is the name of the region whose main campus is in Cambridge?

**Question 5**

How much did it cost to build Harvard Stadium?

**Question 6**

How many academic units make up Radcliffe?

**Question 7**

How big is the Allston district in Boston?

**Question 8**

Where is the Longwood Medical area located?

**Question 9**

How many sports are played in athletics facilities?

**Text number 3**

Harvard was founded in 1636 by the Great and General Court of the Massachusetts Bay Colony. Initially it was called "New College" or "New Towne College". In 1638, the college became home to the first known printing press in North America, which was transported on the ship John of London. In 1639, the college was renamed Harvard College after the late John Harvard, a clergyman and Cambridge University alumnus. He had left the school £779 and a library of some 400 books. Harvard Corporation's charter was granted in 1650.

**Question 0**

In what year was the school founded?

**Question 1**

Which organisation organised the establishment of the school?

**Question 2**

In what year did the first North American printing press start operations?

**Question 3**

What year was the school renamed Harvard College?

**Question 4**

In what year was Harvard Corporation granted a charter?

**Question 5**

What was the name of the ship John of London?

**Question 6**

What did the Massachusetts Bay Colony Court vote for John Harvard in 1650?

**Question 7**

Who founded Cambridge in 1650?

**Question 8**

When did John of London come to live in Cambridge?

**Question 9**

Which university did John of London graduate from?

**Text number 4**

In its early years, the College trained many Puritan priests (a publication from 1643 stated that the school's purpose was "to promote learning and preserve it for posterity, for fear of leaving illiterate clergy to the parishes while our present priests lie in the dust"). The school offered a classical curriculum based on the English university model - many of the colony's leaders had attended Cambridge University - but it was Puritan. It was never affiliated to any particular denomination, but many of its first graduates later became priests in Congregational and Unitarian churches.

**Question 0**

Which denomination of priests did the university train in the early years?

**Question 1**

Which higher learning model is the school designed around?

**Question 2**

Was the school officially affiliated with a religion?

**Question 3**

What group was trained in Cambridge in 1643?

**Question 4**

What year was Cambridge founded?

**Question 5**

What was the purpose of Cambridge when it was founded in 1643?

**Question 6**

What profession did many Cambridge graduates study in 1643?

**Question 7**

Which churches did Cambridge graduates join after 1643?

**Text number 5**

Throughout the 1700s, Enlightenment ideas about the power of reason and free will became prevalent among Congregationalist ministers, putting them and their congregations in tension with the more traditional Calvinist parties.1-4 When Hollis divinity professor David Tappan died in 1803 and Harvard president Joseph Willard a year later in 1804, a struggle began over their successors. Henry Ware was elected to the professorship in 1805, and the liberal Samuel Webber was appointed president of Harvard two years later, marking a shift in power from the dominance of traditionalist ideas at Harvard to the dominance of liberal, Arminian ideas (defined by traditionalists as Unitarian ideas):4-5:24

**Question 0**

What year did Harvard President Joseph Willard die?

**Question 1**

Which liberal succeeded Joseph Willard as president?

**Question 2**

In what year was Henry Ware elected president?

**Question 3**

In what year did Henry Ware die?

**Question 4**

What happened after the death of Henry Ware and Samuel Webber?

**Question 5**

In which year was David Tappan elected president?

**Question 6**

When did Calvinist parties and traditional ideas begin to dominate universities?

**Question 7**

Which denomination did the Hollis Professor of Divinity join?

**Text number 6**

In 1846, Louis Agassiz's lectures on natural history became popular both in New York and on the Harvard College campus. Agassiz's approach was clearly idealistic, suggesting that Americans should "participate in divine nature" and have the possibility of understanding "intelligent existences". Agassiz's approach to science combined observation and intuition with the assumption that man could grasp the "divine design" in all phenomena. In explaining life forms, Agassiz relied for his evidence on form questions based on a hypothetical archetype. This twofold view of knowledge was in harmony with the common sense realism of the Scottish philosophers Thomas Reid and Dugald Stewart, whose works were part of the Harvard curriculum at the time. The popularity of Agassiz's efforts to 'fly with Plato' was probably also due to other writings that Harvard students became familiar with, such as the Platonic treatises of Ralph Cudworth, John Norris and, in a romantic vein, Samuel Coleridge. Harvard library records reveal that the writings of Plato and his early modernist and Romantic successors were read almost as regularly in the 19th century as those of the more empirical and deistic Scottish school of 'official philosophy'.

**Question 0**

in 1846, whose lectures on natural history were praised in New York and Harvard?

**Question 1**

Agassiz's approach to science combined observation and what?

**Question 2**

Which Common Sense Realism of Scottish philosophers did Agassiz incorporate into his dual view of knowledge?

**Question 3**

Where were Plato's writings praised in 1846?

**Question 4**

What was Plato's approach considered?

**Question 5**

What did Plato's view of science have in common?

**Question 6**

What was the assumption behind Plato's writings?

**Question 7**

What evidence did Plato use to explain life forms?

**Text number 7**

Charles W. Eliot, principal from 1869 to 1909, removed Christianity's favoured place in the curriculum, while opening it up to student self-direction. Although Eliot was a central figure in the secularisation of American higher education, he was motivated not by a desire to secularise education, but by transcendentalist Unitarian convictions. The convictions of William Ellery Channing and Ralph Waldo Emerson focused on the dignity and worth of human nature, the right and capacity of every human being to perceive truth, and the God within every human being.

**Question 0**

Which president removed the Christian position from the curriculum?

**Question 1**

What conviction motivated Eliot to move towards secularism?

**Question 2**

Who was the origin of the movement followed by Eliot?

**Question 3**

How many years was William Ellery Channing President of Harvard?

**Question 4**

When Channing removed Christianity from its former place in the curriculum, what was allowed instead?

**Question 5**

Channing was a key figure in achieving what in US universities?

**Question 6**

What ideas motivated Channing to remove the dominance of Christianity from university curricula?

**Question 7**

What was the focus of the Christian curriculum before it was changed?

**Text number 8**

James Bryant Conant (President, 1933-1953) revived creative scholarship to ensure its pre-eminence among research institutions. Seeing higher education as an opportunity for the talented rather than a privilege for the wealthy, Conant developed programmes to identify, recruit and support talented young people. In 1943, he asked the faculty to make a definitive statement on what general education should be at both secondary and tertiary levels. The resulting report, published in 1945, was one of the most influential pronouncements in the history of American education in the 20th century.

**Question 0**

Who led the school back to being a leading research institution in the 2nd century?

**Question 1**

How has the school managed to attract the best talented students?

**Question 2**

What year in the 1900s did Harvard publish an important document on American education?

**Question 3**

Whose main goal was to attract the wealthy to Harvard?

**Question 4**

What good would it do Harvard to attract wealthy students?

**Question 5**

In 1945, what was university as a way for the wealthy to study?

**Question 6**

What did Conant develop to attract wealthy students to the school in 1933?

**Question 7**

What did wealthy students need when they came to Harvard in 1945?

**Text number 9**

At Radcliffe, women were still segregated, even though more and more of them were studying at Harvard. Nevertheless, Harvard students were still predominantly male, and for every woman at Radcliffe, there were about four men at Harvard College. After the merger of Harvard and Radcliffe in 1977, the proportion of female students increased steadily, reflecting the development of higher education in the United States as a whole. Harvard's graduate schools, which had already admitted more women and other groups before the University, also diversified in the post-World War II period.

**Question 0**

What was the ratio of men to women at Harvard/Radcliffe?

**Question 1**

What year did Harvard and Radcliffe merge?

**Question 2**

What was the trend in the number of female students in the 1970s and beyond?

**Question 3**

At what time were women not banned from Radcliffe?

**Question 4**

Which college was founded during the Second World War?

**Question 5**

What happened to Radcliffe's research schools during the Second World War?

**Question 6**

During what period did Radcliffe become a major university?

**Question 7**

How many Harvard campuses were there in 1977?

**Text number 10**

Harvard's main campus of 209 hectares (85 acres) is located in Harvard Yard in Cambridge, about 5 km west-west of State House in downtown Boston, and extends into the surrounding Harvard Square area. Harvard Yard is home to the University's central administrative offices and main libraries, academic buildings such as Sever Hall and University Hall, Memorial Church and most of the student residences. Second-, third- and third-year students live in twelve dormitories, nine of which are on the south side of Harvard Yard along or near the Charles River. The other three are located in a residential area a half-mile northwest of the Yard in the Quadrangle (commonly known as the Quad), which formerly housed students from Radcliffe College until Radcliffe merged its dormitory system with Harvard. Each residence hall has rooms for students, house masters and faculty, as well as a dining hall and library. The facilities were made possible by a donation from Yale University alumnus Edward Harkness.

**Question 0**

How far is Harvard Yard in downtown Boston from the State House?

**Question 1**

How many dormitories are home to upperclassmen, sophomores, juniors and seniors?

**Question 2**

Nine dwellings are located along which geographical boundary?

**Question 3**

How far from the yard is the Quad located?

**Question 4**

On how many hectares of land is the State House located?

**Question 5**

Where is Edward Harkness from?

**Question 6**

Who used to live in Sever Hall?

**Question 7**

Why were Radcliffe College students no longer living in Sever Hall?

**Question 8**

Where is Edward Harkness' office located?

**Text number 11**

Harvard Business School and many of the University's sports facilities, including Harvard Stadium, are located on a 145-hectare (358-acre) campus opposite the Cambridge campus in Allston. The John W. Weeks Bridge is a pedestrian bridge over the Charles River that connects the two campuses. Harvard Medical School, Harvard Dental School and Harvard School of Public Health are located on a 21-hectare (8.5-acre) campus in the Longwood Medical and Academic District, approximately 5.3 kilometres (5.3 miles) southwest of downtown Boston and 5.3 kilometres (5.3 miles) south of the Cambridge campus.

**Question 0**

Where is Harvard Stadium located?

**Question 1**

What is the name of the bridge that connects parts of the Charles River campus?

**Question 2**

Where are Harvard Medical, Dental and Public Health Schools located?

**Question 3**

What is the name of the bridge over the Longwood Medical and Academic area?

**Question 4**

How wide is the Charles River flowing through?

**Question 5**

How many kilometres does a person walk to cross the John W. Weeks Bridge?

**Question 6**

What is the circumference of Harvard Stadium?

**Question 7**

Which medical school is located in Allston?

**Text number 12**

Harvard has bought land in Allston, which is within walking distance of Cambridge across the Charles River, and plans to expand southwards. The University now owns about fifty percent more land in Allston than in Cambridge. Proposals to link the Cambridge campus with the new Allston campus include new and expanded bridges, a shuttle service and/or a tram. There are also plans to sink part of Storrow Drive (at Harvard's expense) to replace it with parkland and pedestrian access to the Charles River, and to build bike paths and buildings throughout the Allston campus. The institution asserts that such an expansion will benefit not only the school but also the surrounding community, pointing to improved transportation infrastructure, possible public shuttle buses, and park space that is also open to the public, among other things.

**Question 0**

How much more land does a school own in Allston than in Cambridge?

**Question 1**

What proposals have been made to merge campuses?

**Question 2**

What additional benefits will enlargement bring to the surrounding community?

**Question 3**

What has Cambridge bought from Allston?

**Question 4**

Why has Cambridge bought land from Allston?

**Question 5**

How much land does Cambridge own in Allston?

**Question 6**

Who does Cambridge think will benefit from the extension?

**Question 7**

What infrastructure will be improved on Storrow Drive?

**Text number 13**

Harvard's 2,400 professors, lecturers and teachers teach 7,200 undergraduate and 14,000 postgraduate students. The school's colour is Crimson, which is also the name of Harvard's sports teams and its daily newspaper, The Harvard Crimson. The colour was unofficially adopted (instead of magenta) by a vote of the student body in 1875, although some connection to red can be traced back to 1858, when Charles William Eliot, a young graduate student who later became Harvard's 21st and longest-serving president (1869-1909), bought his crew red scarves so that spectators could more easily distinguish them from one another at regattas.

**Question 0**

How many professors, teachers and lecturers are there at Harvard in total?

**Question 1**

What is the number of students at Harvard?

**Question 2**

How many graduate students are there at Harvard?

**Question 3**

When did Harvard adopt crimson as its official colour?

**Question 4**

What year has the earliest traces of the color Crimson at Harvard?

**Question 5**

When did The Harvard Crimson publish its first issue?

**Question 6**

How many people were in the Harvard-sponsored regatta in 1875?

**Question 7**

How many people usually attend Harvard sports teams' games each year?

**Question 8**

How many students did Charles William Eliot teach while at Harvard?

**Question 9**

What did Eliot do for the school by awarding the Harvard Crimson at the 1875 regatta?

**Text number 14**

Harvard has the largest university endowment in the world. As of September 2011[update], it had almost recouped the losses it suffered during the 2008 recession. It was worth $32 billion in 2011, up from $28 billion in September 2010 and $26 billion in 2009. In 2008-2009 it suffered losses of around 30%. In December 2008, Harvard announced that its endowment had lost 22% (about $8 billion) from July to October 2008, necessitating budget cuts. Subsequent reports indicated that the losses were in fact more than double, with almost 50% of the Foundation's budget reduced in the first four months alone. Forbes estimated in March 2009 that the losses were around $12 billion. One of the most visible results of Harvard's attempts to balance its budget was the halting of construction of the $1.2 billion Allston Science Complex, which was due to be completed by 2011, leading to protests from local residents. As of 2012[update], Harvard University had a total reserve of $159 million for student financial aid and $4,093 million for Pell Grants.

**Question 0**

What was Harvard's donation amount in 2011?

**Question 1**

How big were the losses suffered by the Harvard Fund in the 2008-2009 financial crisis?

**Question 2**

Which project did Harvard stop because of the funding crisis?

**Question 3**

What are the Harvard Pell Grant allocations?

**Question 4**

What is Harvard's total grant reserve?

**Question 5**

How much did Harvard cut from its 2012 financial aid budget?

**Question 6**

How much did Forbes donate to charity in 2009?

**Question 7**

How big were Forbes' losses in 2008?

**Question 8**

What construction was stopped by Forbes in 2008?

**Question 9**

What did local residents do when Forbes reported budget cuts in 2011?

**Text number 15**

During the movement to divest from South Africa in the late 1980s, student activists erected a symbolic "shantytown" in Harvard's courtyard and blocked a speech by South African Vice-Consul Duke Kent-Brown. Harvard's management company repeatedly refused to divest, stating that "no financially unrealistic demands should be made on operating expenses, nor should the whining of the uninformed or special interest groups". However, the university eventually reduced its South African holdings by $230 million (from $400 million) in response to pressure.

**Question 0**

When was there a movement to leave South Africa?

**Question 1**

Which South African vice-consul's speech was blocked by Harvard students?

**Question 2**

How much did Harvard management reduce its holdings in South Africa as a result of the pressure?

**Question 3**

In which year did South African Deputy Consul Duke Kent-Brown take up his post?

**Question 4**

Which Duke Kent-Brown erected in South Africa to protest against Harvard?

**Question 5**

What did Kent-Brown do to interrupt the Harvard speech?

**Question 6**

How much money had Kent-Brown invested in Harvard?

**Question 7**

How much did Kent-Brown reduce its investment in Harvard?

**Text number 16**

The Carnegie Foundation describes Harvard's admission as "more selective, fewer transfers". Harvard College accepted 5.3 percent of applicants for the class of 2019, a record low and the second lowest acceptance rate among all national universities. Harvard College discontinued its early admission program in 2007 because the program was believed to disadvantage low-income and underrepresented minority applicants applying to selective universities, but for the class of 2016, the Early Action program was reinstated.

**Question 0**

What is the admission rate of applicants for the class of 2019?

**Question 1**

What year did Harvard end its early admission program?

**Question 2**

Why did Harvard end its early admission programme?

**Question 3**

What year was the early admission programme reintroduced?

**Question 4**

How is access to the Early Action programme characterised?

**Question 5**

What is the approval rate for the Early Action programme for 2019?

**Question 6**

What is the role of Early Action among other programmes?

**Question 7**

When did the Carnegie Foundation start managing university admissions statistics?

**Question 8**

For which applicants does the Carnegie Foundation want more support?

**Text number 17**

The four-year, full-time undergraduate programme accounts for a minority of the university's enrolments, with an emphasis on teaching that focuses on the "arts and sciences". From 1978 to 2008, students were required to complete a seven-course core curriculum outside their area of specialisation. Since 2008, undergraduate students have been required to take courses in eight general education categories: aesthetic and interpretive understanding, culture and beliefs, empirical and mathematical reasoning, ethical reasoning, science of living systems, science of the physical universe, world societies and the United States of America in the world. Harvard offers a comprehensive doctoral programme, with a high level of co-existence between graduate and undergraduate studies. The Carnegie Foundation for the Advancement of Teaching, The New York Times and some students have criticised Harvard for its dependence on teaching grants in some areas of undergraduate education, which they say adversely affects the quality of education.

**Question 0**

In 1978 and 2008, four-year full-time undergraduate students were required to complete how many courses outside their concentration?

**Question 1**

How many general education courses do students studying after 2008 have to complete to obtain a diploma?

**Question 2**

What criticism of the NY Times article that affects the quality of Harvard education?

**Question 3**

How many courses outside its focus did the Carnegie Foundation require in 2007?

**Question 4**

What were the enrolments in the Ethical Thinking programme in 2007?

**Question 5**

What have been the priorities of the ethical thinking agenda since 2007?

**Question 6**

How many courses have students in the Ethical Thinking programme had to take since 1978?

**Question 7**

Who does the Carnegie Foundation depend on for some university education issues?

**Text number 18**

Harvard's academic programmes run semesters with a calendar starting in early September and ending in mid-May. Students generally take four half-courses per semester and must maintain a four-course average to be considered full-time. In many majors, students may choose a core program or a program appropriate to their grades that requires a thesis and/or advanced courses. Students in the top 4-5% of the class receive summa cum laude, students in the top 15% of the class receive magna cum laude, and students in the top 30% of the class receive cum laude. Harvard has chapters of academic honor societies, such as Phi Beta Kappa, and several hundred honorary awards are given annually by various committees and departments. Harvard, along with other universities, has been accused of grade inflation, although there is evidence that the quality and motivation of the student body has also improved. Harvard College reduced the number of students receiving Hispanic honours from 90% in 2004 to 60% in 2005. In addition, the "John Harvard Scholar" and "Harvard College Scholar" honours are now awarded only to the top five percent of each class and the next five percent.

**Question 0**

What is the duration of the Harvard academic year?

**Question 1**

How many courses do undergraduate students have to take to study full-time?

**Question 2**

What will be awarded to the top 4-5% of graduating students?

**Question 3**

From 2004 to 2005, Harvard reduced the number of students receiving a Hispanic honours degree from 90% to what?

**Question 4**

What does the basic programme require?

**Question 5**

What percentage of students are admitted to Phi Beta Kappa each year?

**Question 6**

What proportion of students suffered from grade inflation in 2004?

**Question 7**

What increased Harvard's student numbers in 2005?

**Question 8**

Which two decorations were awarded more often in 2005?

**Text number 19**

For the 2012-13 academic year, the annual tuition fee was $38 000, and the total cost was $57 000. Since 2007, families with incomes below $60 000 pay nothing for their children, including room and board. Families earning between $60 000 and $80 000 pay only a few thousand dollars a year, and families earning between $120 000 and $180 000 pay no more than 10% of their annual income. In 2009, Harvard offered a total of $414 million in scholarships across all eleven departments. $340 million came from institutional funds, $35 million from federal support and $39 million from other external support. Grants account for 88% of Harvard's support for undergraduate students, and support is also provided through loans (8%) and work-study (4%).

**Question 0**

What is the tuition fee for 2012 - 13 years at Harvard?

**Question 1**

What are the total costs for 2012-2013?

**Question 2**

How much will students from families earning less than $60 000 pay in school fees after 2007?

**Question 3**

How many fellowships did Harvard award in 2009?

**Question 4**

How much of the total financial support for Harvard students was in the form of scholarships?

**Question 5**

What did families earning less than $38 000 pay for tuition fees in 2009?

**Question 6**

What else did families earning less than $38 000 not have to pay in 2009?

**Question 7**

How much did students pay in total to study at Harvard in 2007?

**Question 8**

How many student loans can you apply for in four years at Harvard?

**Question 9**

How many dormitories were in use at Harvard in 2012?

**Text number 20**

Harvard University's library system is centred on the Widener Library in Harvard Yard, and includes nearly 80 individual libraries with over 18 million volumes. According to the American Library Association, this makes it the largest academic library in the United States and one of the largest in the world. Cabot Science Library, Lamont Library and Widener Library are the three most popular libraries used by students because of their easy access and central location. Harvard's libraries hold rare books, manuscripts and other special collections; the Houghton Library, the Arthur and Elizabeth Schlesinger Library on the History of Women in America and the Harvard University Archives consist mainly of rare and unique materials. America's oldest collection of old and new maps, geographic charts and atlases is housed in the Pusey Library and is open to the public. The Harvard-Yenching Library houses the largest collection of East Asian language materials outside East Asia.

**Question 0**

What is the central library of the Harvard Library System?

**Question 1**

How many volumes are there in the Harvard Library System in total?

**Question 2**

What are the 3 most popular libraries in the Harvard system for students?

**Question 3**

Where is the oldest collection of maps, gazettes and atlases in America?

**Question 4**

Where is the American Library Association located?

**Question 5**

How many books have been approved by the American Library Association?

**Question 6**

What is it about the size of the Lamont Library that gives it its unique position?

**Question 7**

What is the status of the Harvard University Archives among students?

**Question 8**

What kind of access to the Harvard University Archives is available to students?

**Text number 21**

Harvard has several art, culture and science museums. The Harvard Art Museums include three museums. The Arthur M. Sackler Museum contains collections of ancient, Asian, Islamic and later Indian art; the Busch-Reisinger Museum, formerly the Germanic Museum, covers Central and Northern European art; and the Fogg Museum of Art covers Western art from the Middle Ages to the present, with an emphasis on Italian early Renaissance, British pre-Raphaelite and 19th century French art. The Harvard Museum of Natural History includes the Harvard Mineralogical Museum, the Harvard University Herbarium with the Blaschka Glass Flower Exhibition, and the Museum of Comparative Zoology. Other museums include the Le Corbusier-designed Carpenter Center for the Visual Arts, which houses a film archive, the Peabody Museum of Archaeology and Ethnology, which specialises in the cultural history and civilisations of the Western Hemisphere, and the Semitic Museum, which displays artefacts from excavations in the Middle East.

**Question 0**

How many museums are part of the Harvard Art Museums?

**Question 1**

What does the Fogg Museum of Art cover?

**Question 2**

Which museum specialises in the cultural history and civilisations of the Western Hemisphere?

**Question 3**

What is the former name of the Arthur M. Sackler Museum?

**Question 4**

How many museums does the Busch-Reisinger Museum comprise?

**Question 5**

Who designed the Fogg Art Museum?

**Question 6**

What kind of French art is kept at the Arthur M. Sackler Museum?

**Question 7**

Which glass flower exhibition belongs to the Busch-Reisinger Museum?

**Text number 22**

Harvard University is highly ranked in many university rankings. In particular, it has consistently been at the top of the Academic Rankings of World Universities (ARWU) since 2003 and at the top of THE World Reputation Rankings since 2011, when such rankings were first published. When the THE-QS World University Rankings were jointly published by QS and the Times between 2004 and 2009, Harvard was also ranked first every year. The University's undergraduate program has consistently ranked in the top two in U.S. News & World Report. In 2014, Harvard was ranked number one in University Ranking by Academic Performance (URAP). It ranked 8th in the PayScale College Salary Report 2013-2014 and 14th in the PayScale College Education Value Rankings 2013. According to a survey conducted by The Princeton Review, Harvard is the second most commonly named "dream college" by both students and parents in 2013, up from the number one choice by parents in 2009. In the 2011 Mines ParisTech : Professional Ranking of World Universities rankings, Harvard was the number one university in the world in terms of the number of alumni holding CEO positions at Fortune Global 500 companies.

**Question 0**

Since when has Harvard been at the top of the academic rankings of the world's universities?

**Question 1**

Since when was Harvard at the top of the world reputation rankings?

**Question 2**

Harvard has been ranked as a "Dream College" by the Princeton Review in 2013.

**Question 3**

Since when has ARWU been ranking academic performance?

**Question 4**

In which years did Harvard introduce the new undergraduate programme?

**Question 5**

Which news magazine went online exclusively in 2009?

**Question 6**

How did students rate The Princeton Review as the most informative magazine in 2013?

**Question 7**

How did US News and World Report rank in terms of the role of CEOs in 2011?

**Text number 23**

The Harvard Crimson competes in 42 varsity sports in the NCAA's Ivy League division. Harvard and Yale University have a fierce sports rivalry, culminating in The Game, although the Harvard-Yale Regatta is older than the football game. However, this rivalry is sidelined every two years when the Harvard and Yale track and field teams get together to compete against a combined team from Oxford and Cambridge Universities. This competition is the oldest continuous international amateur competition in the world.

**Question 0**

How many intercollegiate sports does Harvard compete in the NCAA Division I?

**Question 1**

What is Harvard's fiercest rival?

**Question 2**

At what time will the Harvard-Yale competition be put aside?

**Question 3**

In how many sports does Yale compete in the NCAA Ivy League division?

**Question 4**

What is the competition like between Oxford and Cambridge?

**Question 5**

What is the culminating event of the Oxford and Cambridge competition?

**Question 6**

How often do Oxford and Cambridge leave their competition aside?

**Question 7**

How old is the NCAA Ivy League division competition?

**Text number 24**

The rivalry between Harvard and Yale is fierce in every sport they meet, culminating in a football match every autumn, which began in 1875 and is usually referred to simply as "The Game". While Harvard's football team is no longer among the best in the country, as it often was a century ago in the early days of football (it won the Rose Bowl in 1920), both Harvard and Yale have influenced the way the game is played. In 1903, Harvard Stadium ushered in a new era in football, as the first permanent reinforced concrete stadium in the country. In fact, the stadium's design played a role in the development of college football. Walter Camp (former captain of the Yale football team) proposed widening the field to open up the game, in order to reduce the alarming number of deaths and serious injuries. However, the stadium was too narrow to accommodate a wider playing surface. So other measures had to be taken. Camp instead backed revolutionary new rules for the 1906 season. These included the legalisation of the forward pass, perhaps the most significant rule change in the history of the sport.

**Question 0**

When did Yale and Harvard first play football?

**Question 1**

What year did Harvard Stadium become the first concrete stadium in the country?

**Question 2**

That year saw the introduction of a number of significant rule changes, including the introduction of forward feeding?

**Question 3**

At which school was Walter Camp captain of the football team?

**Question 4**

Which event did Yale win in 1920?

**Question 5**

Which stadium was built in 1920?

**Question 6**

How did Yale start a new era in football?

**Question 7**

What was Walter Camp's position on the Harvard football team?

**Question 8**

What newly legalised movement did the Harvard football team support in 1920?

**Text number 25**

Harvard has several sports facilities, including Lavietes Pavilion, a multi-purpose arena and home to Harvard's basketball teams. The Malkin Athletic Center, known as the "MAC", serves as both the University's main recreational facility and a satellite venue for several varsity sports. The five-story building features two cardio rooms, an Olympic-size swimming pool, a smaller pool for water aerobics and other activities, a mezzanine for all kinds of classes, an indoor cycling studio, three weight rooms and a three-court gymnasium for basketball. The MAC offers personal trainers and special classes. It is the home of Harvard volleyball, fencing and wrestling. The offices of several of the school's varsity coaches are also located at the MAC.

**Question 0**

What is the name of the Harvard basketball facility?

**Question 1**

What is the name of Harvard's premier recreational sports facility?

**Question 2**

How many weight rooms are there in the Malkin Athletic Center?

**Question 3**

In which building do Olympic athletes train?

**Question 4**

What does Lavietes Pavillion do as a satellite site?

**Question 5**

How many floors are there in the Lavietes Pavillion?

**Question 6**

How many heart rooms are there in the Lavietes Pavillion?

**Question 7**

What kind of swimming pool is there at Lavietes Pavillion?

**Text number 26**

The Harvard-Yale Regatta is 23 years older than The Game, and is the original source of the sporting competition between the two schools. It is held annually in June on the Thames River in eastern Connecticut. The Harvard crew is generally considered one of the best rowing teams in the country. Today, Harvard has top teams in several other sports, including the Harvard Crimson men's hockey team (which has strong competition from Cornell), squash, and even recently won NCAA titles in men's and women's fencing. Harvard also won the Interuniversity Sailing Association national championships in 2003.

**Question 0**

Harvard - Yale Regatta precedes "The Game" by how many years?

**Question 1**

In which body of water will the Harvard-Yale regatta take place?

**Question 2**

Who is the primary rival for the Harvard Crimson hockey team?

**Question 3**

What year did Harvard win the Intercollegiate Sailing Association national championship?

**Question 4**

What state is Yale in?

**Question 5**

Which river is near Cornell University?

**Question 6**

How is the Yale rowing team ranked?

**Question 7**

Which event did Cornell win in 2003?

**Question 8**

What month does the Harvard Crimson men's hockey team play?

**Text number 27**

Politics: John Hancock, John Adams, John Quincy Adams, Rutherford B. Hayes, Theodore Roosevelt, Franklin D. Roosevelt, John F. Kennedy, John F. Kennedy, Al Gore, George W. W. Bush and Barack Obama; Chilean President Sebastián Piñera; Colombian President Juan Manuel Santos; Costa Rican President José María Figueres; Mexican Presidents Felipe Calderón, Carlos Salinas de Gortari and Miguel de la Madrid; Mongolian President Tsakhiagiin Elbegdorj; Peruvian President Alejandro Toledo; Taiwanese President Ma Ying-jeou; Canadian Governor General David Lloyd Johnston; Indian MP Jayant Sinha; Albanian Prime Minister Fan St. Noli; Canadian Prime Ministers Mackenzie King and Pierre Trudeau; Greek Prime Minister Antonis Samaras; Israeli Prime Minister Benjamin Netanyahu; former Pakistani Prime Minister Benazir Bhutto; US Prime Minister Benjamin Netanyahu; US Prime Minister Benazir Bhutto; Israeli Prime Minister Benjamin Netanyahu; Israeli Prime Minister Benjamin Netanyahu; US Prime Minister Benazir Bhutto; US Prime Minister Benazir Bhutto; US Prime Minister Benjamin Netanyahu. Shaun Donovan, Minister of Housing and Urban Development; Michael Ignatieff, Canadian Political Director; Murtaza Bhutto and Sanam Bhutto, Members of the Provincial Assembly of Pakistan; Abul Maal Abdul Muhith, Minister of Finance of Bangladesh; Abdiweli Mohamed Ali, President of Puntland; Anthony Luzzatto Gardner, US Ambassador to the European Union.

**Question 0**

Which UN Secretary-General went to Harvard University?

**Question 1**

Which Columbia president went to Harvard?

**Question 2**

Who is the president of Costa Rica who went to Harvard?

**Question 3**

Which Harvard alumnus was the Prime Minister of Palestine?

**Question 4**

Where did Benjamin Netanyahu give a speech recently?

**Question 5**

What office did George W. Bush hold?

**Question 6**

In which office has Barack Obama recently completed his last term?

**Question 7**

Where did Barack Obama give his last speech in 2016?

**Question 8**

Which Union does Antonis Samaras belong to?

**Text number 28**

Other: Burroughs, authors Ralph Waldo Emerson and William S. Burroughs, educators Werner Baer, Harlan Hanson, poets Wallace Stevens, T. S. Eliot and E. E. E. E. E. Cummings; conductor Leonard Bernstein; cellist Yo Yo Ma; pianist and composer Charlie Albright; composer John Alden Carpenter; comedian, host and writer Conan O'Brien; actors Tatyana Ali, Nestor Carbonell, Matt Damon, Fred Gwynne, Hill Harper, Rashida Jones, Tommy Lee Jones, Ashley Judd, Jack Lemmon, Natalie Portman, Mira Sorvino, Elisabeth Shue and Scottie Thompson; film directors Darren Aronofsky, Terrence Malick, Mira Nair and Whit Stillman; architect Philip Johnson; musicians Rivers Cuomo, Tom Morello and Gram Parsons; musician, producer and composer Ryan Leslie; serial killer Ted Kaczynski; programmer and activist Richard Stallman; NFL:NFL quarterback Ryan Fitzpatrick; NFL quarterback Matt Birk; NBA player Jeremy Lin; US National Ski Team skier Ryan Max Riley; doctor Sachin H. Riley. Jain, physicist J. Robert Oppenheimer, computer pioneer and inventor An Wang, Tibetologist George de Roerich and Marshal Isoroku Yamamoto.

**Question 0**

Which TV presenter and writer went to Harvard?

**Question 1**

Which famous conductor went to Harvard?

**Question 2**

What is a world-famous cellist who is a former Harvard student?

**Question 3**

Which famous civil rights leader called Harvard home?

**Question 4**

Who was the former host of Late Night with Conan O'Brien?

**Question 5**

Which actor starred in the film Saving Private Ryan?

**Question 6**

Who is a Tampa Bay Buccaneers player?

**Question 7**

Which actor starred in Men in Black?

**Question 8**

Who directed Noah in 2014?

**Text number 29**

Harvard faculty include biologist E. O. Wilson, cognitive scientist Steven Pinker, physicists Lisa Randall and Roy Glauber, chemists Elias Corey, Dudley R. Herschbach and George M. Whitesides, computer scientists Michael O. Rabin and Leslie Valiant, Shakespeare scholar Stephen Greenblatt, author Louis Menand, critic Helen Vendler, historians Henry Louis Gates Jr. and Niall Ferguson, economists Amartya Sen, N. Gates Jr. Gregory Mankiw, Robert Barro, Stephen A. Marglin, Don M. Wilson III and Martin Feldstein; political philosophers Harvey Mansfield, Baroness Shirley Williams and Michael Sandel; Fields Medal-winning mathematician Shing-Tung Yau; political scientists Robert Putnam, Joseph Nye and Stanley Hoffmann; scientists/composers Robert Levin and Bernard Rands; astrophysicist Alyssa A. Goodman; and forensic scientists Alan Dershowitz and Lawrence Lessig.

**Question 0**

Which Fields Medal-winning mathematician is a Harvard faculty member?

**Question 1**

What are the most prestigious Harvard Law faculty members?

**Question 2**

Which Shakespeare scholar is a Harvard faculty member?

**Question 3**

Which scientist published "Nature's better angels" in 2011?

**Question 4**

Which chemist won the Nobel Prize in Chemistry in 1986?

**Question 5**

Which author is best known for his book Metaphysical Club?

**Question 6**

Which UK citizen supports the Liberal Democrats?

**Question 7**

Which political scientist is one of the founders of the theory of neoliberalism?

**Document number 463**

**Text number 0**

Jacksonville is the largest city by population in the US state of Florida and the largest city by area in the contiguous United States. It is the capital of Duval County, with which the city government was merged in 1968. The merger gave Jacksonville its large size and placed most of the metropolitan population within the city limits; in 2014 it had an estimated population of 853,382, and is actually the most populous city in Florida and Southeast Florida and the 12th most populous city in the United States. Jacksonville is the capital of the Jacksonville metropolitan area, with a population of 1,345,596 in 2010.

**Question 0**

Which Florida city has the most people?

**Question 1**

What was the population of the city of Jacksonville in 2010?

**Question 2**

What is Jacksonville's position in the United States in terms of population alone?

**Question 3**

What county does Jacksonville live in?

**Question 4**

What year did Jacksonville become part of Duval County as a result of the consolidation?

**Question 5**

Which city in Florida has the fewest residents?

**Question 6**

What county was Jacksonville in before 1968?

**Question 7**

What year did Jacksonville merge with Davis County?

**Question 8**

What is the largest metropolitan area in Florida and Southeast Florida?

**Question 9**

Which city has a population of 1 345 596?

**Text number 1**

Jacksonville is located in the First Coast region of northeast Florida on the St. Johns River, about 40 miles south of the Georgia state line and about 550 miles north of Miami. Jacksonville Beaches communities are located along the adjacent Atlantic coast. The area was originally inhabited by the Timucua people, and in 1564 was the site of the French settlement of Fort Caroline, one of the earliest European settlements on the continental United States. During British rule, settlement grew at the narrow point where cattle crossed the river, known to the Seminoles as the Wacca Pilatka and to the British as the Cow Ford. The town was founded in 1822, a year after the United States received Florida from Spain, and named after Andrew Jackson, the first military governor of the Florida territory and the seventh president of the United States.

**Question 0**

Which river flows through Jacksonville?

**Question 1**

How far is Jacksonville from Miami?

**Question 2**

What is the name of the French colony founded in 1564?

**Question 3**

Before the French arrived, the area known as Jacksonville was previously inhabited by which people?

**Question 4**

Which historical figure was Jacksonville named after?

**Question 5**

Which cities are 340 km from Jacksonville?

**Question 6**

What year did the Timucue people live in the Jacksonville area?

**Question 7**

Which British Jacksonville was the location of Jacksonville?

**Question 8**

What grew in the narrow part of the river during the Spanish rule?

**Text number 2**

Port improvements since the late 1800s have made Jacksonville a major military and civilian port. Its location on the river allows for two US Navy bases and the Port of Jacksonville, the third largest seaport in Florida. The two US Navy bases, Blount Island Command and the nearby Navy submarine base at Kings Bay, make up the third largest military base in the United States. Services such as banking, insurance, health care and logistics are major contributors to the local economy. As in much of Florida, tourism is important in the Jacksonville area, particularly golf-related tourism. People from Jacksonville may be called "Jacksonvillians" or "Jaxsons" (also spelled "Jaxons").

**Question 0**

What is the order of the Jacksonville Armed Forces?

**Question 1**

Which sport attracts the most tourists to Jacksonville?

**Question 2**

How many naval bases are located in Jacksonville?

**Question 3**

What do people from Jacksonville sometimes call themselves?

**Question 4**

What has made Jacksonville a major military and civilian jurisdiction since the 20th century?

**Question 5**

How many Marine bases are located in Jacksonville?

**Question 6**

What are people from Florida sometimes called?

**Question 7**

Which port is the third largest seaport in the United States?

**Question 8**

What are some of the minor factors in the local economy?

**Text number 3**

The area of what is now the city of Jacksonville has been inhabited for thousands of years. On Black Hammock Island in the Timucuan National Ecological and Historic Preserve, a research team from the University of North Florida found some of the oldest pottery remains in the United States, dating back to 2500 BC. At the beginning of the historic era, in the 1500s, the area was inhabited by the Mocama, a coastal subgroup of the Timucuan people. At the time of European contact, all the Mocama villages in what is now Jacksonville were part of a powerful chiefdom known as the Saturiwa, centered around the mouth of the St. Johns River. An early map shows a village called Ossachite on the site of the present Jacksonville centre; this may be the earliest recorded name for the area.

**Question 0**

How many years has the current area of Jacksonville been inhabited?

**Question 1**

Who found the pottery found on Black Hammock Island?

**Question 2**

Which civilisation was pottery part of?

**Question 3**

What century is the 1500s known as?

**Question 4**

What is the name of the village that was once located in what is now downtown Jacksonville?

**Question 5**

Which area remained uninhabited for thousands of years?

**Question 6**

What did I borrow from a team of Northern University students to discover ceramics?

**Question 7**

What can university students find dated in the sixteenth century?

**Question 8**

In which region did the Mocama people live in 2500 BC?

**Question 9**

Sauriwa is the earliest known name for which region?

**Text number 4**

French Huguenot explorer Jean Ribault mapped the St. Johns River in 1562 and called it the May River because he found it in May. Ribault erected a stone pillar near present-day Jacksonville, where he claimed the newly discovered land for France. In 1564, René Goulaine de Laudonnière established the first European settlement, Fort Caroline, on the St. Johns River near the main village of Saturiwa. Philip II of Spain ordered Pedro Menéndez de Avilés to protect Spanish interests by attacking the French presence at Fort Caroline. On 20 September 1565, Spanish troops from the nearby Spanish settlement of St Augustine attacked Fort Caroline and killed almost all the French soldiers defending it. The Spanish renamed the fort San Mateo, and after the expulsion of the French, St. Augustine's position as Florida's most important colony was strengthened. The location of Fort Caroline is disputed, but its rebuilding was established on the St. Johns River in 1964.

**Question 0**

Who mapped the St. Johns River in 1562?

**Question 1**

For which nation did Ribault originally claim the site of present-day Jacksonville?

**Question 2**

Who led the invasion of a French colony in 1565?

**Question 3**

What name was given to Fort Caroline after the Spanish invasion?

**Question 4**

Which fortress was rebuilt in 1964?

**Question 5**

Which British explorer chartered the River St John?

**Question 6**

Where did Ribault put up the flag demanding land for France?

**Question 7**

Why did Pedro Menendez de Aviles call the St John's River the River of May?

**Question 8**

Who led the invasion of Spain in 1565?

**Question 9**

In what year was the San Mateo fortress rebuilt?

**Text number 5**

Spain ceded Florida to the British in 1763 after the French and Indian War, and the British soon built the King's Road, which connected St. Augustine to Georgia. The road crossed the St. Johns River at a narrow point called Wacca Pilatka by the Seminole and Cow Ford or Cowford by the British, names that apparently reflect the fact that cattle were brought across the river at this point. The British started growing sugar cane, indigo and fruit, and exporting timber. As a result, the northeast Florida region became more economically prosperous than under the Spanish. The British ceded the area back to Spain in 1783 after losing the American War of Independence, and the Cow Ford settlement continued to grow. After Spain ceded the Florida territory to the United States in 1821, American settlers north of Cow Ford decided to plan the town and draw up streets and site plans. They soon named the town Jacksonville after Andrew Jackson. Isaiah D. Under the leadership of Isaiah Hart, the residents drew up a charter for the city's government, which was approved by the Florida Legislative Council on February 9, 1832.

**Question 0**

After which event did the Spanish cede Florida to Britain?

**Question 1**

What did the English do soon after the invasion of Florida?

**Question 2**

Why is the narrow part of the St John's River called the Cowford?

**Question 3**

Who took control of Florida at the end of the Revolutionary War?

**Question 4**

When was the Jacksonville City Charter adopted?

**Question 5**

When did the French build the Kings Road?

**Question 6**

What are the French building just before the loss of Florida?

**Question 7**

Which city charter was adopted in 1821?

**Text number 6**

During the American Civil War, Jacksonville was an important supply point for pork and cattle shipped from Florida to support the Confederacy. Union troops besieged the town and captured nearby Fort Clinch. Although there were no battles in Jacksonville proper, the town changed hands several times between Union and Confederate forces. The Brick Church skirmish in 1862 outside Jacksonville led to the Confederacy's first victory in Florida. In February 1864, Union troops left Jacksonville and faced the Confederate army at the Battle of Oluste, which resulted in a Confederate victory. Union troops then retreated to Jacksonville and held the city for the remainder of the war. In March 1864, Confederate cavalry encountered a Union expeditionary force, leading to the Battle of Cedar Creek. Warfare and a long occupation left the town scattered after the war.

**Question 0**

Which group was supported by supplies from Jacksonville during the Civil War?

**Question 1**

What was the name of the battle that marked the Confederacy's first victory in Florida?

**Question 2**

After which battle did Union troops return to Jacksonville and occupy it for the rest of the war?

**Question 3**

What factors negatively affected Jacksonville after the war?

**Question 4**

What year was the battle that resulted in a Confederate cavalry unit attacking a Union expedition?

**Question 5**

Who did Jacksonville support with supplies during the War of Independence?

**Question 6**

What was the name of the battle that marked the Confederacy's first defeat in Florida?

**Question 7**

After which battle did Union troops leave Jacksonville for good?

**Question 8**

What battle was the Confederate Calvary involved in in 1862?

**Question 9**

During which word was Jacksonville the central supply point for the North?

**Text number 7**

During the Reconstruction and Gilded Age, Jacksonville and nearby St. Augustine were winter resorts favoured by the rich and famous. Visitors arrived by steamboat and later by rail. President Grover Cleveland attended a subtropical exposition in the city on February 22, 1888, during his trip to Florida. This highlighted the state's prominence as a valuable tourist destination. However, the city's tourism was hit hard in the late 19th century by the outbreak of the Yellow Fever. In addition, the extension of the Florida East Coast Railway further south attracted visitors to other areas. From 1893 to 1938, Jacksonville was home to the Florida Old Confederate Soldiers and Sailors Home and its nearby cemetery.

**Question 0**

During what period did Jacksonville become a popular destination for the rich?

**Question 1**

Which US President visited Jacksonville in 1888?

**Question 2**

What caused Jacksonville tourism to become less desirable in the second half of the 19th century?

**Question 3**

What attracted tourists from Jacksonville to other Florida destinations?

**Question 4**

What other modern mode of travel than the steamboat brought visitors to Florida?

**Question 5**

During what era was Jacksonville no longer a popular destination for the rich?

**Question 6**

Which Senator visited Jacksonville in 1888?

**Question 7**

What caused Jacksonville tourism to become less desirable in the 20th century?

**Question 8**

The sequel to What drew Taurus to Jacksonville?

**Question 9**

What modern modes of travel took visitors to other parts of Florida?

**Text number 8**

On May 3, 1901, a fire broke out in downtown Jacksonville, starting with a kitchen fire. Spanish moss from a nearby mattress factory quickly caught fire, causing the fire to spread rapidly. In just eight hours, it swept through 146 blocks, destroying more than 2,000 buildings, leaving some 10,000 people homeless and killing seven residents. The Confederate Monument in Hemming Park was one of the only landmarks to survive the fire. Governor Jennings declared a state of emergency and sent in the state militia to maintain order. On 17 May, Jacksonville's municipal government resumed operations. It is said that the glow of the flames could be seen in Savannah, Georgia, and clouds of smoke in Raleigh, North Carolina. The fire, known as the Great Fire of 1901, was one of the worst disasters in Florida's history and the largest urban fire in the southeastern United States. Architect Henry John Klutho was a key figure in the rebuilding of the city. The first multi-storey building built by Klutho was the Dyal-Upchurch Building in 1902. The St. James Building, built on the former site of the burned St. James Hotel, was constructed in 1912 as Klutho's crowning achievement.

**Question 0**

What caused the Jacksonville fire to spread in 1901?

**Question 1**

How many buildings were destroyed by the fire in Jacksonville?

**Question 2**

What did the Governor of Florida do after the Jacksonville fire?

**Question 3**

By what name was the Jacksonville fire later known?

**Question 4**

What slowed the spread of the Jacksonville fire in 1901?

**Question 5**

When did the fire destroy 146 buildings in Jacksonville?

**Question 6**

Which fire left 2000 people homeless?

**Question 7**

What was the biggest urban fire in the United States?

**Question 8**

Which architect was prominent in Jacksonville before the fire?

**Text number 9**

In the 1910s, filmmakers living in New York were attracted to Jacksonville's warm climate, exotic locations, excellent rail connections and cheap labour. During the decade, more than 30 silent film studios were established, and Jacksonville was dubbed the "Winter Film Capital of the World". However, the rise of Hollywood as a major film production centre put an end to the city's film industry. One converted film studio remains in Arlington, Norman Studios, which has been converted into the Jacksonville Silent Film Museum at Norman Studios.

**Question 0**

Who was Jacksonville attracting in the 1910s?

**Question 1**

What kind of films were produced in the 30 studios in Jacksonville?

**Question 2**

The popularity of Jacksonville's films earned it what title?

**Question 3**

What caused the collapse of filmmaking in Jacksonville?

**Question 4**

What industries were attracted to Jacksonville in the early 1800s?

**Question 5**

What other film city struggled as Jacksonville grew in popularity?

**Question 6**

What was Hollywood known as?

**Question 7**

What former studio in Jacksonville has been converted into a modern film museum?

**Text number 10**

Jacksonville, like most large cities in the United States, suffered the negative effects of rapid urban sprawl after World War II. The construction of highways prompted residents to move to newer housing in the suburbs. After World War II, Jacksonville's city government began to increase spending to finance new public works projects in the post-war boom. Mayor W. Haydon Burns' Jacksonville Story led to the construction of a new city hall, civic center, public library and other projects that created a dynamic sense of civic pride. However, suburban development and the subsequent wave of middle-class white flight left Jacksonville with a much poorer population than before. The city's most populous ethnic group, non-Hispanic whites, declined from 75.8% in 1970 to 55.1% by 2010.

**Question 0**

What drove residents to quieter suburban housing?

**Question 1**

What was Jacksonville's white population in 2010?

**Question 2**

What term was used to refer to middle class people leaving the suburbs?

**Question 3**

Who was responsible for the new construction projects in Jacksonville?

**Question 4**

Jacksonville began to suffer and decline after what major world event?

**Question 5**

What did Jacksonville suffer from after the First World War?

**Question 6**

Construction, what made people move out of the suburbs?

**Question 7**

How much did Jacksonville's Hispanic population decline? Call

**Question 8**

What started to decline after the First World War?

**Question 9**

What was it called when the white population of Jacksonville moved to the city?

**Text number 11**

Much of the city's tax base evaporated, leading to problems funding education, sanitation and traffic control within the city limits. In addition, residents in the outlying suburbs had difficulty accessing municipal services such as sewerage and building code enforcement. A 1958 study recommended that the City of Jacksonville begin annexing outlying communities to provide the tax base needed to improve services throughout the county. Voters outside the city limits rejected the annexation plans in six referendums between 1960 and 1965.

**Question 0**

What was the reason for the city's funding problems?

**Question 1**

In which part of the city do residents suffer from a lack of city services?

**Question 2**

What was the proposed solution to Jacksonville's tax issues?

**Question 3**

Who voted against the annexation of Jacksonville?

**Question 4**

Why is city funding increasing?

**Question 5**

Where were most municipal services centralised?

**Question 6**

What year did Jacksonville propose to stop annexing remote communities?

**Question 7**

Who voted for the annexation of Jacksonville?

**Text number 12**

In the mid-1960s, corruption scandals began to break out among many city officials, who were elected mainly through the traditional old boys' network. When a grand jury was convened to investigate, 11 officials were indicted and several were forced to resign. The Jacksonville Consolidation, led by J.J. Daniel and Claude Yates, began to gain more support during this period from both inner-city blacks, who wanted more involvement in government, and suburban whites, who wanted more services and more control in the inner city. In 1964, all 15 public high schools in Duval County lost their accreditation. This added momentum to proposals for government reform. Reasons given for the new consolidated government included lower taxes, increased economic development, community unification, improved public spending and more efficient administration by a central authority.

**Question 0**

How were most city officials elected in the 1960s?

**Question 1**

How many city officials have been prosecuted for corruption?

**Question 2**

Which political group started to gain support after the corruption scandal?

**Question 3**

What boosted support for government reform?

**Question 4**

How are most city officials elected after the 1960s?

**Question 5**

How many former city officials were investigated by a grand jury?

**Question 6**

Which political group is losing support after corruption scandals?

**Question 7**

What happened when public secondary schools got accreditation?

**Question 8**

What were the reasons for not merging the government?

**Text number 13**

When a referendum on reunification was held in 1967, voters approved the plan. On October 1, 1968, the governments merged to form the Consolidated City of Jacksonville. The fire, police, health and welfare, recreation, public works, housing and city planning departments were consolidated into the new government. To mark the occasion, then-Mayor Hans Tanzler posed with actor Lee Meredith behind a sign marking the new boundary of the "bold new city of the South" at Florida 13 and Julington Creek. Jacksonville's Better Jacksonville Plan, approved by Jacksonville voters in 2000, approved a half-penny sales tax. This would generate most of the revenue needed for $2.25 billion in major projects that included road and infrastructure improvements, environmental protection, targeted economic development and new or improved public facilities.

**Question 0**

What was the result of the 1967 referendum?

**Question 1**

Who was the mayor of Jacksonville at the time of the merger?

**Question 2**

What was the name of Jacksonville after the merger?

**Question 3**

What was the name of the measure adopted to cover the cost of major projects in the city?

**Question 4**

How did the Better Jacksonville Plan make money?

**Question 5**

What voters rejected in 1967

**Question 6**

What was formed when the government merged in 1967?

**Question 7**

Were services not consolidated under the new government?

**Question 8**

What was Jacksonville referred to before the consolidation?

**Text number 14**

According to the US Census Bureau, the city has a total area of 874.3 square miles (2,264 km2), making Jacksonville the largest city in the contiguous United States, of which 86.66% (757.7 square miles or 1,962 km2) is land and 13.34% (116.7 square miles or 302 km2) is water. Jacksonville surrounds the city of Baldwin. To the north is Nassau County, to the west is Baker County, and to the south are Clay and St. Johns counties; to the east is the Atlantic Ocean and the beaches of Jacksonville. The St. Johns River bisects the city. The Trout River, a major tributary of the St. Johns River, is located entirely within Jacksonville.

**Question 0**

What is the area of Jacksonville?

**Question 1**

What river separates Jacksonville?

**Question 2**

What is the name of the river that is entirely within Jacksonville?

**Question 3**

How much of Jacksonville is made up of water?

**Question 4**

What city surrounds Jacksonville?

**Question 5**

Istui is 874,3 km²?

**Question 6**

Which river surrounds Jacksonville?

**Question 7**

What makes up 11.6% of Jacksonville?

**Question 8**

What is the name of the river that lies just outside Jacksonville?

**Question 9**

Which city surrounds Jacksonville?

**Text number 15**

The tallest building in downtown Jacksonville is the Bank of America Tower, built in 1990 as the Barnett Center. It is 188 metres (617 feet) high and has 42 floors. Other notable buildings include the 37-story Wells Fargo Center (whose distinctive sloping base makes it a building that stands out on the Jacksonville skyline), originally built by Independent Life and Accident Insurance Company in 1972-74, and the 28-story Riverplace Tower, which, when completed in 1967, was the tallest precast, post-tensioned concrete structure in the world.

**Question 0**

What is the difference with Bank of America Tower?

**Question 1**

What was the Bank of America Tower previously known as?

**Question 2**

How high is the Bank of America Tower?

**Question 3**

How many floors are there in a building completed in 1967?

**Question 4**

What makes the Wells Fargo Center stand out?

**Question 5**

In the shortest building in downtown Jacksonville?

**Question 6**

Built 617 m high?

**Question 7**

Which thirty-seven-storey building was built in 1972?

**Question 8**

How many floors are there in the Bank of America tower?

**Text number 16**

Like much of the southern Atlantic region of the United States, Jacksonville has a humid subtropical climate (Köppen Cfa), with mild winters and hot, humid summers. Seasonal rainfall is concentrated in the warmest months from May to September, while the driest months are from November to April. Due to Jacksonville's low latitude and coastal location, the city experiences very little cold weather, and winters are typically mild and sunny. Summers can be hot and wet, and summer thunderstorms with heavy rainfall are common.

**Question 0**

What is the climate like in Jacksonville?

**Question 1**

When does it usually rain in Jacksonville?

**Question 2**

What is the winter weather like in Jacksonville?

**Question 3**

What contributes to Jacksonville's lack of cold weather, apart from the fact that it is on the coast?

**Question 4**

Which city has a tropical climate?

**Question 5**

What are the winters like in Jacksonville besides the hot, dry summers?

**Question 6**

What is the focus during the coldest months of the year?

**Question 7**

High altitude and what contributes to Jacksonville's lack of cold weather issues

**Text number 17**

Average monthly temperatures range from 53 degrees in January to 82 degrees in July. Highs average 18-33 °C (64-92 °F) year-round. High heat indices are common in the region during the summer months, with indices above 43.3 °C (110 °F) possible. The highest recorded temperatures were 104 °F (40 °C) on 11 July 1879 and 28 July 1872. Thunderstorms often break out during a typical summer afternoon. They are caused by rapid warming of the land relative to the water and very high humidity.

**Question 0**

What is the hottest temperature recorded in Jacksonville?

**Question 1**

What is a common phenomenon on summer days?

**Question 2**

What else contributes to Jacksonville's summer storms besides global warming and water?

**Question 3**

What is the hottest month in Jacksonville on average?

**Question 4**

What is the highest recorded monthly temperature in Jacksonville?

**Question 5**

What kind of storms occur in autumn?

**Question 6**

Low humidity and what led to the storms in Jacksonville?

**Question 7**

Tapani Jacksonville's coldest month on record?

**Text number 18**

Jacksonville has suffered less damage from hurricanes than most other East Coast cities, although there is a direct threat of a major hurricane. The city has received only one direct hit from a hurricane since 1871, but Jacksonville has experienced hurricane or near-hurricane conditions more than a dozen times as storms have passed through the state from the Gulf of Mexico to the Atlantic Ocean or from the north or south of the Atlantic and passed over the region. The strongest impact on Jacksonville was Hurricane Dora in 1964, the only storm on record to hit the first coast with hurricane force winds. The storm crossed St. Augustine with winds that had barely subsided to 110 mph (180 km/h), making it a powerful Category 2 on the Saffir-Simpson scale. Jacksonville also suffered damage from Tropical Storm Fay in 2008, which passed through the state and blacked out parts of Jacksonville for four days. Similarly, four years earlier, Jacksonville was hit by flooding from Hurricanes Frances and Jeanne, which made landfall south of the region. These tropical cyclones were the costliest indirect hits on Jacksonville. In 1999, Hurricane Floyd caused damage mainly to Jacksonville Beach. During Floyd, the Jacksonville Beach pier was severely damaged and later demolished. Fay later damaged the rebuilt pier, but did not destroy it. Tropical Storm Bonnie caused minor damage in 2004, while spawning a small tornado. On May 28, 2012, Jacksonville was hit by Tropical Storm Beryl, with winds of up to 113 kilometers per hour (70 miles per hour), which made landfall near Jacksonville Beach.

**Question 0**

Which storm affected Jacksonville the most?

**Question 1**

How fast did the winds blow around St Augustine in the 1964 hurricane?

**Question 2**

What was the name of the storm that hit Jacksonville in May 2012?

**Question 3**

What is the name of the scale used to measure the intensity of hurricanes?

**Question 4**

What year did a tropical storm cause a four-day power outage in Jacksonville?

**Question 5**

Which hurricane affected Jacksonville less than other coastal cities?

**Question 6**

How strong were the winds around St Augustine during the hurricane of 1871?

**Question 7**

Which storm passed through the state and hit Jacksonville in 1964?

**Question 8**

What was damaged during Tropical Storm Fay in 2008?

**Question 9**

Hurricane Dora caused a small what?

**Text number 19**

Jacksonville is the most populous city in Florida and the twelfth most populous city in the United States. In 2010[update], the city had 821,784 people and 366,273 households. Jacksonville has the 10th largest Arab population in the country, with a population of 5,751 according to the 2000 US Census. Jacksonville has the largest Filipino-American community in Florida, with 25,033 in the metropolitan area according to the 2010 census. Much of Jacksonville's Filipino community has served in or has ties to the US Navy.

**Question 0**

Which ethnic group in Jacksonville is the tenth largest?

**Question 1**

How many residents were recorded in the 2010 census of Jacksonville?

**Question 2**

How does the Filipino population in Jacksonville compare to the rest of Florida?

**Question 3**

Which Jacksonville community is known to have strong ties to the Navy?

**Question 4**

In which city are Arabs the twelfth largest ethnic group?

**Question 5**

In what year was Jacksonville home to 366 233 people?

**Question 6**

Where else is the Filipino population smaller than in Jacksonville?

**Question 7**

In that year, there were 5751 Filipinos living in Jacksonville.

**Question 8**

Which branch of the military is a large part of the Arab population of Jacksonville affiliated with?

**Text number 20**

In 2010[update] there were 366 273 households, of which 11.8% were empty. Of these households, 23.9% had children under 18, 43.8% were married couples, 15.2% had a female householder without a husband and 36.4% were non-families. Of all households, 29.7% were made up of individuals and 7.9% had a person aged 65 or over living alone. The average household size was 2.55 and the average family size was 3.21. The city's population was dispersed: 23.9% were under 18, 10.5% were aged 18-24, 28.5% were aged 25-44, 26.2% were aged 45-64 and 10.9% were aged 65 or older. The median age was 35.5 years. There were 94.1 men for every 100 women. For every 100 women aged 18 and over, there were 91.3 men.

**Question 0**

How many households in Jacksonville have only one person?

**Question 1**

How many people in the city of Jacksonville are under 18?

**Question 2**

Which gender is more populous in all groups in Jacksonville?

**Question 3**

How many men over 18 are there per 100 women?

**Question 4**

In what year was Jacksonville home to 366,273 people?

**Question 5**

How many people in the city of Jacksonville are over 18 years old?

**Question 6**

How many women over 18 are there per 100 men?

**Question 7**

Where the average household size was 3.21.

**Question 8**

What percentage of married couples had children living with them?

**Document number 464**

**Text number 0**

According to a study by the World Institute for Development Economics Research at the United Nations University, the richest one per cent of adults owned 40 per cent of the world's wealth in 2000. The three richest people in the world hold more assets than the bottom 48 countries combined. The combined wealth of the top 10 millionaires grew to nearly $41 trillion in 2008. A report published by Oxfam in January 2014 claims that the combined wealth of the world's 85 richest people is equal to 50% of the world's population, or around 3.5 billion people. According to an analysis of the report by the Los Angeles Times, the richest 1% own 46% of the world's wealth. The 85 richest people, a small fraction of the richest 1%, own about 0.7% of humanity's wealth, the same amount as the wealth of the bottom half of the population. More recently, in January 2015, Oxfam reported that the richest 1% will own more than half of the world's wealth by 2016. A study by Credit Suisse in October 2014 also claims that the top 1% now own almost half of the world's wealth and that rising inequality could trigger a recession. In October 2015, Credit Suisse published a study which found that global inequality continues to rise and that half of the world's wealth is now held by the top 1 percent, each with assets of more than $759,900. A report published by Oxfam in 2016 claimed that the 62 richest individuals own as much wealth as the poorest half of the world's population combined. However, Oxfam's claims have been challenged by the methodology used: using net wealth (adding up assets and subtracting liabilities), the Oxfam report finds, for example, that there are more poor people in the US and Western Europe than in China (due to a greater tendency to take on debt).[unreliable source?] [unreliable source?] Anthony Shorrocks, lead author of the Credit Suisse report, one of the sources of Oxfam's data, considers the criticism of debt to be a "silly argument" and "an irrelevant issue ... a red herring".

**Question 0**

What percentage of the world's wealth is held by the richest 1% of people?

**Question 1**

According to Oxfam, the 85 richest people have as much wealth as how many average people?

**Question 2**

How much money does a person need to raise each year to be considered in the top percentile?

**Question 3**

What has caused Oxfam's findings to be called into question?

**Question 4**

Why do Oxfam and Credit Suisse believe that their results are suspect?

**Question 5**

What percentage of the world's wealth in 2000 was owned by just one per cent of adults?

**Question 6**

What do the three richest people in the world have more of than the lowest 48 nations combined?

**Question 7**

What was the combined wealth of the "$10 million millionaires" in 2008?

**Question 8**

How much of the world's wealth will be owned by the richest 1% by 2016?

**Question 9**

Why are there more poor people in the US and Europe than in China?

**Question 10**

How much of the world's wealth is held by the richest 10% of people?

**Question 11**

According to Oxfam, the 58 richest people have as much wealth as how many average people?

**Question 12**

How much money does a person need to raise each year to be considered in the bottom 1%?

**Question 13**

What has caused Oxfam's findings to go unchallenged?

**Question 14**

Why do Oxfam and Credit Suisse believe that their findings will be accepted?

**Text number 1**

According to PolitiFact, the 400 richest Americans "have more wealth than half of all Americans combined". According to an article published by the New York Times on 22 July 2014, "the richest 1 percent of Americans now own more wealth than 90 percent of the richest". Inherited wealth may help explain why many Americans who have become rich may have had a "considerable head start". In September 2012, the Institute for Policy Studies found that more than 60 per cent of the 400 richest Americans in Forbes "grew up in a position of considerable privilege".

**Question 0**

How many Americans are richer than more than half of all citizens?

**Question 1**

Which publication printed that the richest 1% have more money than the bottom 90%?

**Question 2**

What is considered a potential wealth advantage for some Americans?

**Question 3**

What did the 400 richest Americans have as children that helped them succeed as adults?

**Question 4**

What do the 400 richest Americans have more than half of all Americans combined?

**Question 5**

Who owns more wealth than 90% of the US population?

**Question 6**

What can explain why some Americans who have become rich may have had a head start?

**Question 7**

How many of the 400 richest Americans grew up in a position of considerable privilege?

**Question 8**

Which institute published the results of the Forbes 400 Richest Americans in September 2012?

**Question 9**

How many Americans are richer than less than half of all citizens?

**Question 10**

Which publication printed that the richest 1% have more money than the bottom 99%?

**Question 11**

What is considered a potential disadvantage of the wealth of some Americans?

**Question 12**

What did the 40 richest Americans have as children that helped them succeed as adults?

**Question 13**

What do the 400 richest Americans have less than half of all Americans combined?

**Text number 2**

According to neoclassical economics, income inequality is caused by differences in the surplus value of labour, capital and land. Within-labour income distribution is due to differences in the surplus value produced by different classes of workers. In this perspective, wages and profits are determined by the marginal value added of each economic agent (worker, capitalist/business owner, landowner). Thus, in a market economy, inequality reflects the productivity gap between high-wage and low-wage occupations.

**Question 0**

Which philosophical school of thought deals with wealth inequality?

**Question 1**

What are the causes of income inequality?

**Question 2**

What influences the distribution of wealth when assessing work?

**Question 3**

Which term describes the difference between the earnings of higher and lower paid professionals?

**Question 4**

How is income determined in a market with differently skilled workers?

**Question 5**

What did neoclassical economics attribute the inequality of income distribution to?

**Question 6**

What is the distribution of labour income due to the differences?

**Question 7**

What determines the threshold for the value added by an economic operator?

**Question 8**

What are some examples of economic operators?

**Question 9**

What does inequality reflect in a market economy?

**Question 10**

Which philosophy of thought deals with equality of wealth?

**Question 11**

What are the causes of income inequality?

**Question 12**

What affects the distribution of wealth when labour force is not estimated?

**Question 13**

What is the term that describes the disparity between what higher-paid and lower-paid professionals earn?

**Question 14**

How are incomes determined in a market with different types of unskilled workers?

**Text number 3**

According to Marxist analysis, capitalist firms are increasingly replacing labour input (workers) with capital equipment under competitive pressure to reduce costs and maximise profits. In the long run, this trend increases the organic composition of capital, which means that fewer workers are needed relative to capital inputs, thus increasing unemployment ("labour reserve army"). This process puts downward pressure on wages. The replacement of labour by capital equipment (mechanisation and automation) raises the productivity of each worker, leading to a situation where the wages of the working class remain relatively unchanged while the property income of the capitalist class increases.

**Question 0**

What makes companies put more pressure on workers?

**Question 1**

What impact does working harder have on your company's productivity?

**Question 2**

When fewer workers are needed, what happens to the labour market?

**Question 3**

What impact will improving worker productivity and wage equalisation have on higher earners?

**Question 4**

What do capitalist enterprises substitute for equipment in Marxist analysis?

**Question 5**

Why are companies replacing workers with equipment?

**Question 6**

Which trend will increase the organic composition of capital in the long term?

**Question 7**

What will replacing equipment with labour do to workers?

**Question 8**

What kind of wages will mechanisation and automation lead to?

**Question 9**

What makes companies reduce the pressure on workers?

**Question 10**

How do reduced working hours affect the productivity of your company?

**Question 11**

When more workers are needed, what happens to the labour market?

**Question 12**

How will increased worker productivity and wage equalisation affect those on lower incomes?

**Question 13**

In Marx's analysis, what do capitalist enterprises not replace with equipment?

**Text number 4**

In a purely capitalist mode of production (i.e. where trade unions and workers' organisations cannot limit the number of workers), workers' wages are not controlled by these organisations or the employer, but rather by the market. Wages work in the same way as the prices of any other good. Thus, wages can be seen as a function of the market price of skills. And therefore inequality is determined by this price. According to the law of supply and demand, the price of a skill is determined by competition between the demand for a skilled worker and the supply of a skilled worker. "On the other hand, markets can also concentrate wealth, shift environmental costs to society, and abuse workers and consumers." "The market itself, even if stable, often leads to high inequality, and outcomes are widely perceived as unfair. "Employers who offer below-market wages find that their companies are chronically understaffed. Their competitors take advantage of this situation by offering higher wages to their best workers. For a businessman whose primary interest is profit, it is unprofitable to offer workers below or above market wages.

**Question 0**

What is driven by the market and the economy?

**Question 1**

Under which law is the value of an employee determined?

**Question 2**

What happens when companies underpay their workers?

**Question 3**

How do competing companies attract employees?

**Question 4**

How do workers generally feel about income inequality?

**Question 5**

What drives wages in a purely capitalist mode of production?

**Question 6**

What wages work the same way as for any other commodity?

**Question 7**

What can be considered a function of the market price of skills?

**Question 8**

What can concentrate wealth, shift environmental costs to society and abuse both workers and consumers?

**Question 9**

What kind of results can even a stable market lead to?

**Question 10**

What is not controlled by the market and the economy?

**Question 11**

What happens when companies overpay their employees?

**Question 12**

Under which law is the value of an employee undefined?

**Question 13**

How do competing companies drive workers away?

**Question 14**

How do workers generally feel about income inequality?

**Text number 5**

A job with a large number of workers willing to work long hours (high supply) and competing for work that few people want (low demand) leads to low wages for that job. This is because competition between workers drives down wages. An example of this is jobs such as dishwasher or customer service representative. Competition between workers tends to drive down wages because workers are consumptive in relation to their particular job. A job where there are few capable or willing workers (low supply) but a high demand for jobs (high demand) will result in high wages for that job. This is because competition between employers for workers drives up wages. Examples include jobs requiring advanced skills, rare talents or high risk levels. Due to the nature of the job, competition between employers tends to drive up wages because there is a relative shortage of workers for the job. Trade unions and labour organisations can limit the supply of workers, leading to higher demand and higher incomes for members. Members can also obtain higher wages through collective bargaining, political influence or corruption.

**Question 0**

What tends to raise wages in a particular sector or job?

**Question 1**

With many workers competing for a few jobs, it is considered a what?

**Question 2**

What is the potential earned income in a job with few skilled workers but many vacancies?

**Question 3**

What could lead to higher wages for members of workers' organisations?

**Question 4**

Who is working for higher compensation for workers?

**Question 5**

What is the result of the fact that many workers who are willing to do a lot of work are competing for work that requires only a few workers?

**Question 6**

What drives down wages in a job where many workers are prepared to work long hours?

**Question 7**

Why does competition between workers drive down wages?

**Question 8**

What kind of wages can be obtained for jobs where supply is low but demand is high?

**Question 9**

Competition between workers lowers wages in workplaces with many workers, but whose competition raises wages in the opposite workplaces?

**Question 10**

What tends to drive down wages in a particular sector or job?

**Question 11**

With many workers competing for many jobs, it is considered a what?

**Question 12**

What is the potential earned income in a job where there are many skilled workers but many vacancies?

**Question 13**

What could lead to a reduction in the salaries of members of social partners?

**Question 14**

Who is working to get lower compensation for workers?

**Text number 6**

On the other hand, greater economic inequality tends to increase the level of entrepreneurship at the individual level (self-employment). However, most of this is often based on necessity rather than opportunity. Need-based entrepreneurship is motivated by survival needs, such as income for food and shelter ("push" motivations), while opportunity-based entrepreneurship is driven by achievement motivations ("pull" motivations), such as vocation, and is more likely to be associated with the pursuit of needs for new products, services or market sub-services. The economic effects of the former type of entrepreneurship tend to be redistributive, while the latter is expected to promote technological development and thus have a more positive impact on economic growth.

**Question 0**

What increases as income inequality increases?

**Question 1**

At the heart of what concept of worker is survival?

**Question 2**

What are the motivators considered to be food and shelter?

**Question 3**

What are the perceived motivators of achievement and self-determination?

**Question 4**

What kind of entrepreneurship leads to technological development?

**Question 5**

What increases the level of entrepreneurship at individual level?

**Question 6**

What is the basis for the increased share of self-employment?

**Question 7**

What kind of entrepreneurship is motivated by survival needs, such as income for food and shelter?

**Question 8**

What kind of motivation drives opportunity-based entrepreneurship?

**Question 9**

What is the impact of opportunity-based entrepreneurship on economic growth in general?

**Question 10**

What decreases as income inequality increases?

**Question 11**

Survival is not central to which concept for workers?

**Question 12**

Which motivators are not taken into account for food and shelter?

**Question 13**

What are considered to be the motivators of achievement and external determination?

**Question 14**

What kind of entrepreneurship leads to technological decline?

**Text number 7**

Another reason is the income tax rate and the progressive nature of the tax system. A progressive tax is a tax where the tax rate increases as the tax base increases. In a progressive tax system, the level of the top tax rate often has a direct impact on inequality in society, either by increasing or decreasing it, provided that income does not change as a result of a change in the tax system. In addition, a steeper tax progressivity applied to social expenditure can lead to a more equal distribution of income across the board. The difference between the pre-tax Gini index of income distribution and the post-tax Gini index is an indicator of the effects of such taxation.

**Question 0**

What is it called when the tax rate and the tax base increase at the same time?

**Question 1**

Which tax rate has a direct link to income inequality?

**Question 2**

What can even out the distribution of wealth?

**Question 3**

Which system affects income inequality?

**Question 4**

In a progressive tax, what increases when the tax base increases?

**Question 5**

What directly affects inequality in a system with a progressive tax?

**Question 6**

What can lead to a more equal distribution of income?

**Question 7**

Which index describes the impact of taxes on social expenditure?

**Question 8**

What is it called when the tax rate and the tax base fall at the same time?

**Question 9**

Which tax rate has an indirect link to income inequality?

**Question 10**

What cannot work to even out the distribution of wealth?

**Question 11**

Which scheme has no impact on income inequality?

**Question 12**

In a progressive tax, what increases as the tax base decreases?

**Text number 8**

An important factor in inequalities is the variation in educational opportunities for individuals. Education, especially in a sector where labour demand is high, generates high wages for those with that education, but increased education first increases and then reduces growth and income inequality. As a result, those who cannot afford education or who choose not to pursue elective education tend to earn much lower wages. The argument is that lack of education leads directly to lower incomes and hence lower overall savings and investment. Conversely, education raises incomes and promotes growth by helping to unleash the productive potential of the poor.

**Question 0**

What is the key to acquiring the skills needed for high-demand jobs?

**Question 1**

What are low-income earners less likely to get?

**Question 2**

What does less education lead to when you are at work?

**Question 3**

Whose productive potential is limited when educational opportunities are less available?

**Question 4**

What are fewer people on low incomes likely to have to prepare for the future?

**Question 5**

What is an important factor contributing to inequalities between individuals?

**Question 6**

What does training in a region with a high demand for labour usually create?

**Question 7**

What kind of wages do people who cannot afford education get?

**Question 8**

What does the lack of education lead directly to?

**Question 9**

What will help unlock the productivity potential of the poor?

**Question 10**

What is the key to acquiring the skills needed for low-cost jobs?

**Question 11**

What do people on higher incomes have fewer opportunities?

**Question 12**

What will more training lead to in working life?

**Question 13**

Whose productive potential is limited when educational opportunities are better?

**Question 14**

What are low-income earners more likely to have in order to prepare for the future?

**Text number 9**

In 2014, Standard & Poor's economists said that growing disparities between the wealthiest US citizens and the rest of the country had slowed the US recovery from the 2008-2009 recession and made it more vulnerable to boom and bust cycles. S&P recommended improving access to education as a partial remedy for the wealth gap and the resulting slow growth. It estimates that if the average US worker completed just one more year of schooling, it would boost the country's economic growth by $105 billion over five years.

**Question 0**

What does Standard & Poor's recommend to speed up the economic recovery?

**Question 1**

How much potential economic growth could the US achieve if everyone went to school more?

**Question 2**

What does the US face in the 2008 recession?

**Question 3**

Who concluded that rising income inequality is not improving?

**Question 4**

When did economists come to an agreement with the credit rating agency S&P?

**Question 5**

When will the recovery from the widening gap between the richest citizens and the rest of the nation slow down?

**Question 6**

What did S&P recommend to close the wealth gap?

**Question 7**

If the average US worker completed an extra year of school, how much growth would occur over five years?

**Question 8**

What do wealth inequalities expose the economy to?

**Question 9**

What did Standard & Poor's recommend to slow down the economic recovery?

**Question 10**

How much potential economic growth could the US achieve if everyone went to school less?

**Question 11**

What does the US face in the 2000 recession?

**Question 12**

Who concluded that rising income inequality is getting better?

**Question 13**

When have economists reached a conclusion without the S&P rating agency?

**Text number 10**

During the 1910-1940 high school education movement, the number of skilled workers increased, leading to a fall in the price of skilled labour. The purpose of high school education during this period was to equip students with the skills they needed to perform in the workforce. In fact, it differs from today's upper secondary education, which is seen as a stepping stone to higher education and higher qualifications. This decline in wages caused a period of compression and reduced inequality between skilled and unskilled workers. Education is crucial for economic growth, but gender inequalities in education also affect the economy. Lagerlof and Galor found that gender inequality in education can lead to poor economic growth and further gender inequality in education, creating a poverty trap. It has been suggested that a large gap in education between men and women may be a sign of backwardness, which may be associated with lower economic growth, which may explain why there are economic inequalities between countries.

**Question 0**

When was the upper secondary education movement born?

**Question 1**

What impact did the high school education movement have on the presence of skilled workers?

**Question 2**

What impact did the high school education movement have on the wages of skilled workers?

**Question 3**

What affects the gender pay gap?

**Question 4**

What contributed to the reduction of inequalities between trained and unskilled workers?

**Question 5**

When was the mass secondary school education movement?

**Question 6**

What led to the increase in the number of skilled workers?

**Question 7**

How did the education of the early upper secondary school teaching movement differ from the later upper secondary school education?

**Question 8**

What is very important for economic growth?

**Question 9**

What can lead to a poverty trap?

**Question 10**

When was the middle school education movement born?

**Question 11**

How did the high school education movement affect the presence of unskilled workers?

**Question 12**

What impact did the high school education movement have on the wages of unskilled workers?

**Question 13**

What does not affect the gender pay gap?

**Question 14**

What contributed to the growing inequality between educated and uneducated workers?

**Text number 11**

CEPR's John Schmitt and Ben Zipperer (2006) point to economic liberalism and the deregulation of business and the decline in trade union membership as one of the causes of economic inequality. Analysing the effects of intensive Anglo-American liberal policies compared to continental European liberalism, where trade unions have remained strong, they conclude that "the US economic and social model is associated with significant levels of social exclusion, including high levels of income inequality, high relative and absolute poverty, poor and unequal educational outcomes, poor health outcomes, and high crime and incarceration rates. At the same time, the available evidence does little to support the view that labour market flexibility such as in the US would dramatically improve labour market outcomes. Despite biases to the contrary, the US economy consistently offers lower levels of economic mobility than all continental European countries for which data are available."

**Question 0**

Which types of organisations are declining in the US, adversely affecting economic mobility?

**Question 1**

Which countries have higher economic mobility than the US?

**Question 2**

What is the policy for encouraging trade unions?

**Question 3**

How much support is there for the US approach to economic development?

**Question 4**

Why is economic liberalism one of the reasons?

**Question 5**

What is remarkable about the US economic and social model?

**Question 6**

Which organisation are John Schmitt and Ben Zipperer members of?

**Question 7**

How much evidence supports the view that labour market flexibility improves labour market outcomes?

**Question 8**

How does economic mobility in the US economy compare with that of European countries?

**Question 9**

What types of organisations are declining in the US, which are adversely affecting economic immobility?

**Question 10**

In which countries is economic mobility lower than in the US?

**Question 11**

What is the policy not to encourage trade unions?

**Question 12**

How much support is there for the UN approach to economic development?

**Question 13**

Why is economic liberalism not one of the reasons?

**Text number 12**

University of Washington sociologist Jake Rosenfield argues that the decline of organised labour in the US has played a more important role in the rise in income inequality than the technological changes and globalisation experienced by other industrialised countries that did not experience sharp rises in inequality. He points out that countries with high levels of organisation, particularly Scandinavia, have very low levels of inequality, and notes that "the historical pattern is clear; the transnational pattern is clear: high inequality goes hand in hand with weak labour movements and vice versa".

**Question 0**

Which countries have low income inequality and high union density?

**Question 1**

To what does a weak labour movement correlate?

**Question 2**

What has had a negative impact on the US labour market?

**Question 3**

What has caused more problems for the US economy than for other nations?

**Question 4**

What is Jake Rosenfield's occupation?

**Question 5**

Which university does Jake Rosenfield join?

**Question 6**

What does Rosenfield think is the most important factor in widening income inequality?

**Question 7**

What is the level of unionisation in the Scandinavian countries?

**Question 8**

What does high inequality have to do with it?

**Question 9**

In which country is income inequality low and trade unions few?

**Question 10**

What does a strong labour movement correlate with?

**Question 11**

What has had a negative impact on the UN labour market?

**Question 12**

What has caused more problems for the UN economy than for other nations?

**Question 13**

What is not Jake Rosenfield's profession?

**Text number 13**

Trade liberalisation can shift economic inequalities from a global to a domestic scale. When rich countries trade with poor countries, the wages of low-skilled workers in rich countries may fall as a result of competition, while the wages of low-skilled workers in poor countries may rise. Trade economist Paul Krugman argues that trade liberalisation has had a measurable impact on rising inequality in the US. He says this trend is due to increased trade with poorer countries and the fragmentation of productive assets, which leads to more fungible low-skilled jobs. However, he acknowledges that the impact of trade on inequality in the US is small compared to other causes, such as technological innovation, and this is the view of other experts. Empirical economists Max Roser and Jesus Crespo-Cuaresma find support in the data that international trade increases income inequality. They empirically confirm the predictions of the Stolper-Samuelson theorem on the effects of international trade on income distribution. Lawrence Katz estimates that trade has accounted for only 5-15% of the increase in income inequality. Robert Lawrence argues that technological innovation and automation have meant that low-skilled jobs have been replaced by machine labour in wealthier countries and that there are no longer significant numbers of low-skilled industrial workers in wealthier countries to be affected by competition from poorer countries.

**Question 0**

How does trade with poor countries affect workers in rich countries?

**Question 1**

What impact does trade with richer countries have on workers in poorer countries?

**Question 2**

What affects the US economy more than trade?

**Question 3**

What has replaced lower-skilled workers in the US?

**Question 4**

To what extent does trade liberalisation shift economic inequalities?

**Question 5**

When rich countries trade with poor countries, whose wages go up?

**Question 6**

What, in Paul Krugmen's opinion, has made a noticeable contribution to inequality in the United States?

**Question 7**

Compared to other causes, the impact of trade on inequality in America is what?

**Question 8**

How have low-skilled jobs been replaced by technological innovation and automation?

**Question 9**

How does trade with poor countries affect workers in poor countries?

**Question 10**

Which has less impact on the US economy than trade?

**Question 11**

What has replaced more highly skilled workers in the US?

**Question 12**

To what extent does trade liberalisation not transfer economic inequalities?

**Text number 14**

In many countries, the gender pay gap favours men in the labour market. This difference may be due to a number of factors other than discrimination. On average, women are more likely than men to consider factors other than pay when looking for work, and they may be less willing to travel or relocate. Thomas Sowell, in Knowledge and Decisions, argues that this difference is due to women not taking jobs because of marriage or pregnancy, but income studies show that this does not explain the entire difference. A US Census report found that when other factors are taken into account, there is still a pay gap between women and men. In other countries, the income gap ranges from 53% in Botswana to -40% in Bahrain.

**Question 0**

What is the gender income gap in Botswana?

**Question 1**

What is the gender income gap in Bahrain?

**Question 2**

What is the cause of income inequality in the US?

**Question 3**

Who benefits from the gender pay gap?

**Question 4**

What are the pay gaps in many countries?

**Question 5**

Who does the gender pay gap tend to favour?

**Question 6**

Which gender is less willing to travel or move for work?

**Question 7**

Who is the author of the book "Information and Decisions"?

**Question 8**

What does the US Census report say that even after adjusting for other factors, there is still this gap between men's and women's earnings?

**Question 9**

What is not the gender income gap in Botswana?

**Question 10**

What is not the gender income gap in Bahrain?

**Question 11**

What are the causes of income inequality in the United Nations?

**Question 12**

Who is harmed by the gender pay gap?

**Question 13**

What kind of pay gap does not exist in many countries?

**Text number 15**

Economist Simon Kuznets argued that economic inequality is largely due to developmental stages. According to Kuznets, wealth is relatively evenly distributed in countries with low levels of development. As a country develops, it acquires more capital, which leads to the owners of this capital having more wealth and income, thus increasing inequality. Through various possible redistributive mechanisms, such as social welfare programmes, more developed countries eventually return to lower levels of inequality.

**Question 0**

What programmes help redistribute wealth?

**Question 1**

What is the level of inequality in underdeveloped countries?

**Question 2**

What brings inequality to the country?

**Question 3**

What leads to a smaller income gap?

**Question 4**

What is Simon Kuznets's occupation?

**Question 5**

What did Kuznets claim the developmental stages were due to?

**Question 6**

What does a country acquire as it develops?

**Question 7**

What do owners of more capital end up with?

**Question 8**

What are the redistribution mechanisms leading to?

**Question 9**

Which programmes do not help redistribute wealth?

**Question 10**

What is the level of inequality in overdeveloped countries?

**Question 11**

What does not bring inequality to the country?

**Question 12**

What leads to rising income inequalities?

**Question 13**

What profession does Simon Kuznets not have?

**Text number 16**

In plotting the relationship between income levels and inequality, Kuznets saw that the level of inequality in middle-income developing countries was inflating to form what is now known as the Kuznets curve. Kuznets showed this relationship using cross-sectional data. However, more recent testing of the theory with better panel data has shown it to be very weak. The Kuznets curve predicts that income inequality will decrease over time. As an example, income inequality did indeed fall in the United States during its high school movement from 1910 to 1940 and beyond. However, recent data show that the level of income inequality started to rise after the 1970s. This does not necessarily disprove Kuznets' theory, but it may be possible that another Kuznets cycle is underway, specifically the shift from manufacturing to the service sector, which means that it may be possible for several Kuznets cycles to be in effect at any given time.

**Question 0**

Over what period did income inequality fall in the US?

**Question 1**

When did income inequality start to rise in the US?

**Question 2**

In which sector are jobs starting to grow?

**Question 3**

In which sector are jobs starting to fall?

**Question 4**

Who drew the relationships between income levels and inequality?

**Question 5**

What is the widening inequality in the emerging economy?

**Question 6**

What have recent tests of Kuznets' theory with better data shown?

**Question 7**

What does the Kuznets curve predict about income inequality over time?

**Question 8**

What could be the possibility that several Kuznets cycles are running simultaneously?

**Question 9**

During which period did income inequality increase in the US?

**Question 10**

When did income inequality start to fall in the US?

**Question 11**

In which sector are jobs starting to fall?

**Question 12**

In which sector are jobs starting to grow?

**Question 13**

Who has never drawn the relationship between income and inequality?

**Text number 17**

Wealth concentration is the theoretical [according to whom?] process whereby, under certain conditions, newly created wealth is concentrated in the hands of already wealthy individuals or communities. According to this theory, those who already have wealth have the means to invest in new sources of wealth creation or otherwise take advantage of the accumulation of wealth, so they are the beneficiaries of the new wealth. Over time, wealth accumulation can contribute significantly to the persistence of inequality in society. Thomas Piketty, in his book Capital in the Twenty-First Century, argues that the underlying force of inequality is that returns to capital (r) are generally higher than economic growth (g) and that larger assets generate higher returns [p. 384 Table 12.2, Size of US university holdings vs. real annual returns].

**Question 0**

What is the process for adding new wealth to those who already have it?

**Question 1**

According to the concentration of wealth theory, what advantage do the wealthy have in accumulating new wealth?

**Question 2**

What has the biggest impact on wealth accumulation and the resulting income gap?

**Question 3**

What usually leads to more money?

**Question 4**

Where is newly created wealth concentrated?

**Question 5**

Who is best placed to benefit from wealth accumulation?

**Question 6**

What can significantly contribute to the persistence of inequalities in society over time?

**Question 7**

Who wrote the book "Capital in the Twenty-First Century"?

**Question 8**

What do larger assets produce?

**Question 9**

By what process is old wealth given to those who already have it?

**Question 10**

According to the concentration of wealth theory, what is the disadvantage of the wealthy in accumulating new wealth?

**Question 11**

What has the least impact on wealth accumulation and the resulting income inequality?

**Question 12**

What usually leads to less money?

**Question 13**

Where is the wealth created in the past concentrated?

**Text number 18**

Economist Joseph Stiglitz argues that market forces should not explain the concentration of wealth and income, but should rather act as a brake on such concentration, which is better explained by a non-market force called "rent-seeking". While the market raises compensation for rare and desirable skills as a reward for wealth creation, higher productivity, etc., it also prevents successful entrepreneurs from making excessive profits by promoting competition to cut prices, profits and high compensation. According to Stiglitz, the rise in inequality is better explained by the fact that certain groups use the political power generated by wealth to shape government policies that benefit them economically. This process, known to economists as rent-seeking, generates income not from wealth creation but from "grabbing a larger share of the wealth that would otherwise have been produced without their efforts".

**Question 0**

What kind of career does Joseph Stiglitz have?

**Question 1**

What forces should act as a brake on wealth accumulation?

**Question 2**

Which skills are more highly remunerated in the market?

**Question 3**

What do certain wealthy groups use to get policies that benefit them financially?

**Question 4**

Economists are familiar with income not from wealth creation but from getting a bigger share, by what term?

**Question 5**

What career does Joseph Stiglitz not have?

**Question 6**

What forces should not act as a brake on the concentration of wealth?

**Question 7**

What skills are remunerated in the market?

**Question 8**

What do certain wealthless groups use to get policies that are economically advantageous to them?

**Question 9**

Income that comes not from wealth creation but from grabbing a smaller share of it is known to economists by what term?

**Text number 19**

Researchers have identified the effects of inequality as including higher rates of health and social problems and lower levels of social goods, lower levels of economic benefits to society due to resources devoted to high levels of consumption, and even lower levels of economic growth when human capital is excluded for high levels of consumption. When considering the 21 largest industrialised countries, where each person counts equally, life expectancy is lower in the more unequal countries (r = -.907). There is a similar relationship between US states (r = -.620).

**Question 0**

Increased health and social problems are just two examples of the effects of what?

**Question 1**

Why is economic growth lower because of high consumption?

**Question 2**

Which is lower in countries with more inequality among the 21 largest industrialised countries?

**Question 3**

What is the reason for the lower share of social goods?

**Question 4**

What happens to life expectancy in less economically equal states?

**Question 5**

Reduced health and social problems are just two examples of the effects of what?

**Question 6**

Why is economic growth higher thanks to high consumption?

**Question 7**

Which is higher in countries with more inequality among the 21 largest industrialised countries?

**Question 8**

What is the higher share of social goods?

**Question 9**

What happens to life expectancy in the more economically equal US states?

**Text number 20**

Robert J. Shiller, winner of the 2013 Nobel Prize in Economics, said that rising inequality in the US and the rest of the world is the main problem. High and persistent unemployment with rising inequality has a negative impact on subsequent long-term economic growth. Unemployment can hamper growth not only because it is a waste of resources, but also because it causes redistributive pressures and subsequent distortions, drives people into poverty, limits liquidity, which restricts labour mobility, and undermines self-esteem, which contributes to social division, unrest and conflict. Policies that aim to manage unemployment, and in particular to reduce its inequality-related effects, support economic growth.

**Question 0**

What year did Robert J. Shiller win the Nobel Prize in Economics?

**Question 1**

What is the main problem in the US and elsewhere?

**Question 2**

What impact does persistent unemployment have on long-term economic growth?

**Question 3**

What is one factor that undermines self-esteem?

**Question 4**

Policies that reduce the inequality effects of unemployment support what kind of growth?

**Question 5**

In what year did Robert J. Shiller lose the Nobel Prize in Economics?

**Question 6**

What is the least important problem in the US and elsewhere?

**Question 7**

What is one factor that increases self-esteem?

**Question 8**

What impact does persistent unemployment have on short-term economic growth?

**Question 9**

Policies that reduce the inequality effects of unemployment are harmful to what kind of growth?

**Text number 21**

British researchers Richard G. Wilkinson and Kate Pickett have found that health and social problems (obesity, mental health problems, homicide, teenage births, imprisonment, child conflict, drug use) are more common and social goods (life expectancy by country, education levels, trust between strangers, the status of women, social mobility, even the number of patents granted) are lower in countries and states with greater inequality. Using statistics from 23 developed countries and 50 states in the US, they found that social/health problems were lower in countries with high levels of inequality, such as Japan and Finland, and states with high levels of inequality, such as Utah and New Hampshire, than in countries (US and UK) and states (Mississippi and New York) with high levels of household income inequality.

**Question 0**

What nationality are researchers Richard G. Wilkinson and Kate Pickett?

**Question 1**

What are the health and social problems in countries with high levels of inequality?

**Question 2**

How are prices of social goods in countries with higher inequality?

**Question 3**

Health problems were lower in places with more what?

**Question 4**

How many developed countries did British researchers collect statistics on?

**Question 5**

What nationality are researchers Richard G. Wilkinson and Kate Pickett not?

**Question 6**

What are the health and social problems in countries with low inequality?

**Question 7**

How are prices of social goods in countries with lower inequality?

**Question 8**

Health problems were higher in places with more what?

**Question 9**

How many undeveloped countries did British researchers collect statistics on?

**Text number 22**

For most of human history, a higher material standard of living - a full belly, clean water and fuel heat - led to better health and longer life. This pattern of higher incomes leading to longer lives still holds in poor countries, where life expectancy increases rapidly as per capita income rises, but in recent decades the trend has slowed in middle-income countries and stagnated in the richest thirty or so. Americans do not live longer on average (around 77 years in 2004) than Greeks (78 years) or New Zealanders (78 years), despite the fact that the US has a higher GDP per capita. In Sweden (80 years) and Japan (82 years), where income was more evenly distributed, life expectancy was longer.

**Question 0**

Where did a higher material standard of living lead for most of human history?

**Question 1**

In which cases does the "higher income - longer life" model still hold true?

**Question 2**

What is growing fast as per capita income increases?

**Question 3**

Who lives on average as long as Greeks and New Zealanders?

**Question 4**

How is income distributed in Sweden?

**Question 5**

What did a lower material standard of living lead to for most of human history?

**Question 6**

In which cases does the "lower income - longer life" model still hold true?

**Question 7**

What declines rapidly as per capita income rises?

**Question 8**

Who lives longer on average than Greeks and New Zealanders?

**Question 9**

How is income not distributed in Sweden?

**Text number 23**

In recent years, income inequality has been strongly correlated with health in developed countries. Authors Richard Wilkinson and Kate Pickett created a nine-factor "health and social problems" index and found that health and social problems are more common in countries with higher income inequality and more common in US states with higher income inequality. Other studies have confirmed this relationship. UNICEF's index of child well-being in rich countries, which examines 40 indicators in 22 countries, correlates with greater equality but not with per capita income.

**Question 0**

Which characteristic has been strongly linked to health in developed countries in recent years?

**Question 1**

Who created the Health and Social Problems Index?

**Question 2**

How many factors related to health and social problems did Wilkinson and PIckett identify?

**Question 3**

Where are health and social problems most common?

**Question 4**

What is the most correlated with child well-being in rich countries?

**Question 5**

Which characteristic has been weakly associated with health in developed countries in recent years?

**Question 6**

Who rejected the Health and Social Problems Index?

**Question 7**

How many factors of health and social problems did Wilkinson and PIckett not identify?

**Question 8**

Where are health and social problems least prevalent?

**Question 9**

What is the most correlated with child well-being in poor countries?

**Text number 24**

Crime has also been shown to correlate with inequalities in society. Most studies examining this link have focused on homicide, as homicide is defined in almost the same way in all countries and jurisdictions. More than fifty studies have shown that violence is more common in societies with higher income inequality. These studies have compared developed countries with underdeveloped countries and examined regions within countries. Daly et al. 2001 found a tenfold difference in inequality-related homicide rates between US states and Canadian provinces. They estimate that about half of all variation in homicide rates can be explained by differences in the level of inequality within each province or state. Fajnzylber et al. (2002) found a similar relationship worldwide. Comments on the relationship between homicide and inequality in the academic literature include the following:

**Question 0**

What has crime been shown to correlate with in society?

**Question 1**

What is almost identical in all countries and jurisdictions?

**Question 2**

How many studies have shown that violence is more common in societies with income inequality?

**Question 3**

How much of the difference in homicide rates is related to inequality?

**Question 4**

What is estimated to explain about half of all variations in homicide rates?

**Question 5**

What has not been shown to correlate with crime rates in society?

**Question 6**

What is never the same in all nations and jurisdictions?

**Question 7**

How many studies have shown that violence is less frequent in societies with income inequality?

**Question 8**

How much of the difference in homicide rates is not related to inequality?

**Question 9**

What is estimated to explain about a third of all variations in homicide rates?

**Text number 25**

Economic inequality is problematic when the utilitarian principle of maximum benefit for the greatest number is applied. A house that is of less use to a millionaire as a summer home than to a homeless family of five is an example of a deterioration in society's 'distributive efficiency', which reduces the marginal utility of wealth and hence the total amount of personal utility. An extra dollar spent by a poor person goes to things that provide a lot of benefit to that person, such as basic needs like food, water and health care, while an extra dollar spent by a much richer person is very likely to go to luxury goods that provide relatively less benefit to that person. Thus, the marginal benefit of wealth per person ('the extra dollar') decreases as a person gets richer. From this perspective, regardless of the amount of wealth in a society, a society with more equality will have higher total benefits. Some studies have found evidence for this theory and found that societies with lower levels of inequality tend to have higher levels of satisfaction and happiness for the population as a whole.

**Question 0**

What does the utilitarian principle aim to achieve for the greatest number of people?

**Question 1**

Adobe providing less benefit to one person than another is an example of reduced what?

**Question 2**

What is a poor person likely to get for their dollar?

**Question 3**

What does the marginal benefit of wealth per income per person do when that person gets richer?

**Question 4**

What is a more equal society?

**Question 5**

What does the utilitarian principle aim to achieve for the smallest number of people?

**Question 6**

Adobe, which offers more benefits to one person than another, is an example of reduced what?

**Question 7**

What is a rich person likely to get for his or her dollar?

**Question 8**

What does the marginal benefit of wealth per income per person do when that person becomes poorer?

**Question 9**

What is a society with less equality?

**Text number 26**

Conservative scholars have argued that income inequality is not significant because inequality should be measured by consumption rather than income, and consumption inequality in the US is less extreme than income inequality. Will Wilkinson of the libertarian Cato Institute argues that "the weight of evidence suggests that the growth in consumption inequality has been much less dramatic than the growth in income inequality" and that consumption is more important than income. According to Johnson, Smeeding and Tory, consumption inequality was actually lower in 2001 than in 1986. The debate is summarised in the book "The Hidden Prosperity of the Poor" by journalist Thomas B. Edsall. Other studies have found consumption inequality to be no less dramatic than household income inequality, and a CBO study found that consumption data do not "adequately" describe the "consumption of high-income households" as their income does, although it agreed that household consumption figures show a more even distribution than household income.

**Question 0**

What do conservative researchers think should be the measure of inequality?

**Question 1**

What is the political orientation of the Cato Institute?

**Question 2**

When was the consumption gap smaller than in 1986?

**Question 3**

Who wrote the book "The hidden wealth of the poor"?

**Question 4**

What is Thomas B. Edsall's occupation?

**Question 5**

What do conservative researchers think should not be a measure of inequality?

**Question 6**

What political orientation is the Cato Institute not?

**Question 7**

When was the consumption gap smaller than in 1968?

**Question 8**

Who has never written "The hidden wealth of the poor"?

**Question 9**

What is Thomas B. Edsall's occupation not?

**Text number 27**

Central banking economist Raghuram Rajan argues that "systematic economic inequality in the US and elsewhere in the world has created deep economic 'fault lines' that have made crises more likely than in the past" - the most recent example being the financial crisis of 2007-2008. To compensate for the stagnation and decline in purchasing power, political pressures have emerged for easier credit for low and middle income earners - especially for housing - and easier credit in general to keep unemployment rates low. This has led to a tendency for the US economy to move from one 'bubble' to another, fuelled by unsustainable monetary stimulus.

**Question 0**

What is Raghuram Rajan's career?

**Question 1**

What, in Mr Rajani's view, has created deep economic gaps?

**Question 2**

What is the latest example of financial failure points?

**Question 3**

What political pressure is forcing expansion to compensate for the stagnation of purchasing power?

**Question 4**

What has given the US economy the tendency to go from "bubble to bubble"?

**Question 5**

What is not Raghuram Rajan's career?

**Question 6**

What, in Rajan's view, has not created deep economic gaps?

**Question 7**

What is the oldest example of financial failure points?

**Question 8**

What political pressure is not forcing expansion to compensate for stagnating purchasing power?

**Question 9**

What has not given the American economy the tendency to go from "bubble to bubble"?

**Text number 28**

According to IMF economists, wealth and income inequality is negatively correlated with the duration of economic growth (not the growth rate). High inequality not only hinders economic prosperity but also the quality of a country's institutions and high levels of education. According to economists at the IMF, "if the income share of the top 20% (rich) increases, GDP growth actually slows in the medium term, suggesting that the benefits do not trickle down. In contrast, an increase in the income share of the bottom 20% (poor) is associated with higher GDP growth. The poor and the middle class matter most for growth through a number of interconnected economic, social and political channels."

**Question 0**

What correlates negatively with the duration of economic growth?

**Question 1**

What does high inequality prevent besides economic prosperity?

**Question 2**

What will happen to a country's GDP growth if the top 20% income share increases, according to IMF economists?

**Question 3**

What will the increase in the income share of the bottom 20% of society lead to?

**Question 4**

Who matters most for economic growth?

**Question 5**

What correlates positively with the duration of economic growth?

**Question 6**

Besides economic prosperity, what does a low level of inequality prevent?

**Question 7**

What happens to a country's GDP growth if the top 20% income share is reduced, according to IMF economists?

**Question 8**

What will the reduction in the income share of the bottom 20% of society lead to?

**Question 9**

Who matters least for economic growth?

**Text number 29**

According to economists David Castells-Quintana and Vicente Royuela, rising inequality is detrimental to economic growth: high and persistent unemployment, with rising inequality, has a negative impact on subsequent long-term economic growth. Unemployment can hamper growth not only because it is a waste of resources, but also because it causes redistributive pressures and subsequent distortions, drives people into poverty, limits liquidity and labour mobility, and undermines self-esteem, thus contributing to social division, unrest and conflict. Policies that aim to manage unemployment, and in particular to reduce its inequality-related effects, support economic growth.

**Question 0**

What do David Castlles-Quintana and Vicente Royuela do for a living?

**Question 1**

What is the harm of increasing inequality?

**Question 2**

What was the negative impact of persistent unemployment?

**Question 3**

Why is unemployment a drag on growth?

**Question 4**

Policies that aim to curb unemployment support economic growth because they reduce what?

**Question 5**

What do David Castlles-Quintana and Vicente Royuela not do for a living?

**Question 6**

What is the harm of reducing inequalities?

**Question 7**

Where did permanent unemployment have a positive effect?

**Question 8**

Why does unemployment contribute to growth?

**Question 9**

Policies that aim to curb unemployment support economic growth because they contribute to what?

**Text number 30**

In 2009, economist Joseph Stiglitz presented evidence that both global inequality and inequality within countries are hampering growth by limiting aggregate demand. Economist Branko Milanovic wrote in 2001 that "the view that income inequality is a drag on growth - or that improving equality can help sustain growth - has become more widespread in recent years. ...". The main reason for this change is the growing importance of human capital in development. When physical capital was most important, savings and investment were key. It was important then to have many rich people who could save a larger proportion of their income than the poor and invest it in physical capital. But now that human capital is scarcer than machinery, widespread education has become the secret to growth."

**Question 0**

What did Stiglitz say in 2009 about global inequality?

**Question 1**

How does inequality hinder growth?

**Question 2**

What are Branko Milanovic and Joseph Stiglitz?

**Question 3**

What has been the main reason for the shift to the view that income inequality is a drag on growth?

**Question 4**

What is the secret of economic growth?

**Question 5**

What did Stiglitz say in 2008 about global inequality?

**Question 6**

How does inequality contribute to growth?

**Question 7**

What are not both Branko Milanovic and Joseph Stiglitz?

**Question 8**

What has been the main reason for the shift towards the view that income inequality is conducive to growth?

**Text number 31**

Galor and Zeira showed in 1993 that, in the presence of credit market imperfections, inequality has a long-term adverse effect on human capital formation and economic development. Perotti's 1996 study examined the channels through which inequality can affect economic growth. He showed that, in line with the credit market imperfections approach, inequality is associated with lower human capital formation (education, experience and apprenticeships) and higher fertility and hence lower growth. He found that inequality is associated with higher redistributive taxation, which is associated with lower growth due to lower private savings and investment. Perotti concluded that "in more equal societies, fertility rates are lower and investment in education is higher. Both are reflected in higher growth rates. Highly unequal societies also tend to be politically and socially unstable, which is reflected in lower investment and hence lower growth."

**Question 0**

When did Galor and Zeria show new knowledge about inequality?

**Question 1**

What is the impact of inequality on human capital formation if credit markets are imperfect?

**Question 2**

What did the 1996 Perotti study investigate?

**Question 3**

What does inequality have to do with higher levels?

**Question 4**

What are extremely unequal societies like in general?

**Question 5**

When did Galor and Zeria show the old data on inequality?

**Question 6**

what is the impact on human capital formation in a perfect credit market?

**Question 7**

What did Perotti's 1969 study investigate?

**Question 8**

What does inequality have to do with lower levels?

**Question 9**

What are extremely egalitarian societies like in general?

**Text number 32**

A study by Harvard economist Robert Barro found that "there is little link between income inequality and growth and investment". Barro's work in 1999 and 2000 found that high inequality reduces growth in relatively poor countries but boosts growth in richer countries. A study of Swedish counties between 1960 and 2000 found a positive effect of inequality on growth over a period of five years or less, but no link after ten years. Studies of larger datasets have found no correlations at any fixed lead and no negative effect on the duration of growth.

**Question 0**

Which institution is Robert Barro from?

**Question 1**

Barro found that there is little link between income inequality and what?

**Question 2**

How does high inequality affect growth in poor countries?

**Question 3**

How does high inequality affect economic growth in richer countries?

**Question 4**

When was the survey of Swedish counties carried out?

**Question 5**

Which institution is Robert Barro not from?

**Question 6**

Barro noted that there is a lot of correlation between income inequality and prices of what?

**Question 7**

How does high inequality affect growth in rich countries?

**Question 8**

How does low inequality affect economic growth in richer countries?

**Question 9**

When has there been no survey of Swedish counties?

**Text number 33**

Studies of income inequality and growth have sometimes found evidence to confirm Kuznets' curve hypothesis that economic development increases and then decreases inequality. The economist Thomas Piketty challenges this view, arguing that between 1914 and 1945, wars and "severe economic and political shocks" reduced inequality. Moreover, Piketty argues that the 'magic' Kuznets curve hypothesis, which emphasises the equilibrium of economic growth in the long run, cannot explain the significant increase in economic inequality throughout the developed world since the 1970s.

**Question 0**

What studies on income inequality have sometimes found evidence to confirm?

**Question 1**

According to the Kuznets curve, economic development reduces inequality, after which?

**Question 2**

Who questions the Kuznets curve hypothesis?

**Question 3**

What is Thomas Piketty's job?

**Question 4**

What did Piketty think were the biggest factors in reducing inequality between 1914 and 1945?

**Question 5**

What studies on income inequality have sometimes found no evidence to confirm?

**Question 6**

According to the Kuznets curve, economic development increases inequality, after which?

**Question 7**

Who accepts the Kuznets curve hypothesis?

**Question 8**

What is not the work of Thomas Piketty?

**Question 9**

What did Piketty think were the biggest factors in reducing inequality between 1941 and 1945?

**Text number 34**

Some theories developed in the 1970s suggested possible ways in which inequality could have a positive impact on economic development. According to a 1955 review, savings by the wealthy, if increased by inequality, were thought to compensate for a reduction in consumer demand. The 2013 report on Nigeria found that growth has increased as income inequality has increased. Some popular theories from the 1950s to 2011 falsely claimed that inequality had a positive impact on economic development. Analyses based on comparing annual equality figures with annual growth rates were misleading because it takes several years for the effects to translate into changes in economic growth. IMF economists found a strong link between lower inequality in developing countries and longer-term economic growth. Developing countries with high levels of inequality have "managed to trigger high growth for a few years", but "longer periods of growth are strongly associated with a more equal distribution of income". "

**Question 0**

When were theories developed that inequality can have a positive impact on economic development?

**Question 1**

According to the 1955 review, what was the wealthy savings thought to compensate for?

**Question 2**

According to the 2013 report on Nigeria, what has its growth done?

**Question 3**

How long will it take for the effects to be felt in terms of changes in economic growth?

**Question 4**

What are the longer growing seasons associated with?

**Question 5**

When were theories developed that inequality can have a negative impact on economic development?

**Question 6**

According to the 1954 review, what was the wealthy savings thought to compensate?

**Question 7**

According to the 2003 report on Nigeria, what has its growth achieved?

**Question 8**

How long will it take for the effects to be felt in terms of changes in economic growth?

**Question 9**

What are the shorter growing seasons related to?

**Text number 35**

While recognising that economic growth can play a key role in human development, poverty reduction and the achievement of the Millennium Development Goals, there is a growing recognition in the development community that special efforts need to be made to ensure that the poorer sections of society can participate in economic growth. The impact of economic growth on poverty reduction - the growth elasticity of poverty - can depend on the level of inequality. For example, a country with a growth rate of 2% per capita and 40% of the population living in poverty can halve poverty in ten years if inequality is low, but it will take almost 60 years to achieve the same reduction in a country with high inequality. In the words of United Nations Secretary-General Ban Ki-moon: "While economic growth is necessary, it is not sufficient to make progress in poverty reduction. "

**Question 0**

What needs to be done to ensure that the poorer members of society can participate in economic growth?

**Question 1**

What can the growth elasticity of poverty depend on?

**Question 2**

What will take longer to reach a country with high inequality?

**Question 3**

Which Ban Ki-moon was the Secretary-General?

**Question 4**

Where is economic growth not enough to make progress?

**Question 5**

What needs to be done to ensure that the richer members of society can contribute to economic growth?

**Question 6**

What can the growth elasticity of poverty not depend on?

**Question 7**

In a country with high inequality, what does not take longer?

**Question 8**

Which country's Secretary-General Ban Ki-Moon was not?

**Question 9**

Where is economic growth not enough to make progress?

**Text number 36**

In many poor and developing countries, much of the land and housing is outside the formal or legal property registration system. Much of the unregistered property is in informal form through various associations and other arrangements. In some countries, it can take more than 200 steps and up to 14 years to build on state land. This can take up to 14 years. Other reasons for non-legal ownership are that the deeds have not been notarised or the deeds have been notarised but not recorded in an official office.

**Question 0**

What in many developing countries is considered outside the formal legal property registration system?

**Question 1**

How are unregistered assets held informally?

**Question 2**

Excessive bureaucracy is one reason for what kind of ownership?

**Question 3**

How many steps can it take in some countries to build a state on land?

**Question 4**

Why can it sometimes take up to 14 years to get a building permit?

**Question 5**

What is kept within the formal legal system of property registration in many developing countries?

**Question 6**

How is registered property held informally?

**Question 7**

Isn't excessive bureaucracy one of the reasons for what kind of ownership?

**Question 8**

How many steps can it take in all countries to build a state on land?

**Question 9**

Why can it sometimes take up to 41 years to get a building permit?

**Text number 37**

Several researchers (David Rodda, Jacob Vigdor and Janna Matlack) argue that the lack of affordable housing - at least in the US - is partly due to income inequality. David Rodda found that between 1984 and 1991, the number of quality rental housing units declined as the demand for higher quality housing increased (Rhoda 1994:148). The gentrification of older neighbourhoods in East New York, for example, led to a rapid increase in rents as landlords found new tenants willing to pay higher market prices for housing, leaving lower-income families without rental housing. VAT policies combined with rising prices made it difficult or impossible for low-income tenants to keep up.

**Question 0**

What do several researchers believe is partly due to income inequality?

**Question 1**

What number decreased between 1984 and 1991?

**Question 2**

Why did demand for rents fall?

**Question 3**

What led to the rise in rental prices in East New York?

**Question 4**

What, together with rising prices, made it difficult or impossible for poor people to keep up?

**Question 5**

What do many researchers believe, that shortages are not partly due to income inequality?

**Question 6**

What number decreased between 1948 and 1991?

**Question 7**

Why did demand for rents increase?

**Question 8**

What led to the fall in rents in East New York?

**Question 9**

What, combined with lower prices, made it difficult or impossible for poor people to keep up?

**Text number 38**

First, certain costs are difficult to avoid and are common to all, such as housing, pensions, education and healthcare. If the state does not provide these services, the costs have to be borne by those on lower incomes, and it is often those on lower incomes who are less able to manage their finances. Second, target consumption describes the process by which middle-income earners strive to reach the standard of living of their wealthier counterparts, and one way to achieve this goal is by taking on debt. This leads to greater inequality and potential economic instability.

**Question 0**

How are certain costs that are difficult to avoid shared?

**Question 1**

What are low-income earners often unable to do?

**Question 2**

What is the term for when middle-income people strive to achieve the same standard of living as people who are wealthier than themselves?

**Question 3**

What is one way to achieve target consumption?

**Question 4**

When people take on debt, it potentially leads to what?

**Question 5**

How are certain costs that are easy to avoid shared?

**Question 6**

What are those with higher incomes often unable to manage?

**Question 7**

What is the term when the highest earners strive to achieve the same standard of living as people wealthier than themselves?

**Question 8**

What is one way to achieve sweat reduction?

**Question 9**

When people get out of debt, it could lead to what?

**Text number 39**

The lower the economic inequality, the more waste and pollution is generated, which in many cases leads to environmental degradation. This can be explained by the fact that as the poorer people in society become wealthier, their annual carbon dioxide emissions increase. This relationship is illustrated by the Environmental Kuznets Curve (EKC).[not cited] However, it should be noted that in certain cases where economic inequality is high, waste and pollution are not generated more because waste/pollutants are better cleaned afterwards (water treatment, filtration, etc...)..... Note also that the overall increase in pollution is the result of multiplying the increase in emissions per capita by a factor. However, if there were fewer people, this coefficient would be lower and therefore the amount of pollution would be lower. The current high population size has a major impact on this as well. If (as WWF argues) the population were to start to decline to a sustainable level (1/3 of today's, i.e. about 2 billion people), human inequality could be addressed/corrected, but it would still not lead to increased environmental damage.

**Question 0**

With less economic inequality, more waste and pollution?

**Question 1**

What would be smaller if there were fewer people?

**Question 2**

What are the main impacts of the current high population size?

**Question 3**

How can human inequalities be tackled without increasing environmental damage?

**Question 4**

With less political inequality, more waste and pollution?

**Question 5**

What would be higher if there were fewer people?

**Question 6**

What are the main impacts of the current low population size?

**Question 7**

When there is greater economic inequality, there is more waste and pollution?

**Question 8**

How can human inequalities be tackled without reducing environmental damage?

**Text number 40**

According to socialists, the large wealth disparities are due to the fact that private ownership of productive assets belongs to the propertied class, creating a situation in which a small part of the population lives on unearned property income based on ownership of capital equipment, financial assets and shares in companies. In contrast, the vast majority of the population is dependent on wage income. To remedy this situation, socialists argue that the means of production should be owned by society so that income inequality reflects the individual's contribution to the social product.

**Question 0**

What do socialists say is the cause of the great wealth gap?

**Question 1**

Where does private ownership lead?

**Question 2**

On what kind of income does the majority of the population depend?

**Question 3**

How do socialists think the means of production should be owned?

**Question 4**

What would income inequality look like if individual contributions were relevant to the social product?

**Question 5**

What do socialists not blame for the huge wealth disparities?

**Question 6**

Where does private ownership not create a situation?

**Question 7**

What kind of income does the majority of the population not depend on?

**Question 8**

How do socialists think that the means of production should not be owned?

**Question 9**

What would income inequality be like if individual contributions were irrelevant to the social product?

**Text number 41**

Robert Nozick argued that government redistributes wealth by force (usually in the form of taxation) and that the ideal moral society would be one in which all individuals are free from violence. However, Nozick recognised that some modern economic inequalities are the result of the violent seizure of property, and a certain amount of redistribution would be justified to compensate for this force, but not for the inequality itself. John Rawls argued in A Theory of Justice that unequal distribution of wealth is justified only when it improves society as a whole, including its poorest members. Rawls does not address all the implications of his theory of justice. Some see Rawls's argument as a justification for capitalism because, in theory, the poorest members of society also benefit from the innovations that capitalism increases; others believe that only a strong welfare state can satisfy Rawls's theory of justice.

**Question 0**

Who says that the government is redistributing wealth by force?

**Question 1**

What is the usual form of redistribution of government wealth?

**Question 2**

In an ideal moral society, what would all citizens be free from?

**Question 3**

How did some modern economic inequalities come about?

**Question 4**

When is wealth inequality justified according to John Rawls?

**Question 5**

Who claims that the government is redistributing wealth peacefully?

**Question 6**

What is an unusual form of government wealth redistribution?

**Question 7**

In an ideal moral society, what would no citizen be free from?

**Question 8**

How were some modern economic inequalities destroyed?

**Question 9**

When is wealth inequality not justified according to John Rawls?

**Text number 42**

The capability-based approach - sometimes called the human development approach - looks at income inequality and poverty as a form of 'capability gap'. Unlike neoliberalism, which defines welfare as the maximisation of utility, economic growth and income are seen as a means to an end rather than an end in itself. It aims to "expand people's choices and the level of well-being they achieve" by increasing activities (things a person values doing), capabilities (the freedom to enjoy activities) and agency (the ability to pursue worthwhile goals).

**Question 0**

What is poverty according to the capabilities-based approach?

**Question 1**

The capability-based approach sees growth and income as a means to an end rather than a what?

**Question 2**

What is the aim of the capabilities approach?

**Question 3**

How would a capability approach achieve the objective?

**Question 4**

What is the agency's definition of capacity?

**Question 5**

What is not addressed by a capabilities-based approach to poverty?

**Question 6**

In the capabilities approach, growth and income are not seen as a means to an end, but what?

**Question 7**

What is the aim of the disability approach?

**Question 8**

How would the capability approach fail to achieve its goal?

**Question 9**

What is the definition of agency when it is not related to disability?

**Text number 43**

When a person's abilities are impaired, he or she is somehow unable to earn as much income as he or she would otherwise. An old, sick man cannot earn as much as a healthy young man; gender roles and customs may prevent a woman from getting an education or working outside the home. An epidemic can cause widespread panic, or there can be violence in an area that prevents people from going to work for their lives. As a result, income and economic inequalities increase and it becomes more difficult to close the gap without further aid. To prevent such inequalities, this approach emphasises the importance of political freedom, economic relief, social opportunities, guarantees of transparency and protective security to ensure that people are not denied their capacity, ability and agency and are thus able to work towards a better relevant level of income.

**Question 0**

What happens when a person's abilities decrease in relation to his or her income?

**Question 1**

What can't an old, sick man do?

**Question 2**

What factors may prevent women from working outside the home or from getting an education?

**Question 3**

Why would rampant violence stop people from going to work?

**Question 4**

What can people aspire to if they are not denied their activities, abilities and agency?

**Question 5**

What happens when a person's abilities are increased in relation to their income?

**Question 6**

What can an old, sick man do?

**Question 7**

What can't stop women from working outside the home or getting an education?

**Question 8**

Why shouldn't rampant violence stop people from going to work?

**Question 9**

What can people aspire to if they are denied their activities, their abilities and their agency?

**Document number 465**

**Text number 0**

The University of Chicago (UChicago, Chicago or U of C) is a private research university in Chicago. Founded in 1890, the university includes The College, a variety of graduate programs, interdisciplinary committees organized into four academic research departments, and seven professional schools. In addition to the arts and sciences, Chicago is also known for its professional schools, including the Pritzker School of Medicine, University of Chicago Booth School of Business, Law School, School of Social Service Administration, Harris School of Public Policy Studies, Graham School of Continuing Liberal and Professional Studies and Divinity School. The University currently has about 5 000 students and a total enrolment of about 15 000 students.

**Question 0**

What kind of university is the University of Chicago?

**Question 1**

When was the University of Chicago founded?

**Question 2**

How many vocational schools are there at the University of Chicago?

**Question 3**

How many academic research departments are there at the University of Chicago?

**Question 4**

How many students have been recruited at the University of Chicago?

**Question 5**

Which university is located in Pritzker?

**Question 6**

Almost 7000 students are enrolled where?

**Question 7**

What was founded in 1809?

**Question 8**

What else but UChicago or simply Chicago is another term for Graham Business School?

**Question 9**

What other schools are the City of Harris known for?

**Text number 1**

University of Chicago scholars have played a significant role in the development of several academic disciplines, including the Chicago School of Economics, the Chicago School of Sociology, the Law and Economics movement in legal analysis, the Chicago School of Literary Criticism, the Chicago School of Religion, and the Behaviorism school in political science. Chicago's physics department helped develop the world's first man-made, self-sustaining nuclear reaction under the University's Stagg Field. Chicago's research activities have been supported by unique links with world-renowned institutions such as the nearby Fermilab and Argonne National Laboratories and the Marine Biological Laboratory. The University is also home to the University of Chicago Press, the largest university press in the United States. The Barack Obama Presidential Center, expected to be completed in 2020, will be located at the University and will include both the Obama Presidential Library and the offices of the Obama Foundation.

**Question 0**

University of Chicago researchers played a major role in what kind of development?

**Question 1**

Who helped develop the first human self-sustaining nuclear reaction?

**Question 2**

Where is the first human self-sustaining nuclear reaction located?

**Question 3**

What is the name of the largest university press in the US?

**Question 4**

In what year will Barack Obama's presidential centre be completed?

**Question 5**

Where has the University of Biological Physics played a leading role?

**Question 6**

What was the first religion department in the world to help develop?

**Question 7**

In which field did the world's first synthetically produced nuclear reaction take place?

**Question 8**

What is the name of the smallest university weight in the United States?

**Question 9**

By what year is the Stagg Presidential Centre due to be completed?

**Text number 2**

The American Baptist Education Society founded the University of Chicago in 1890 with a donation from John D. Rockefeller, an oil magnate and the richest man in history; William Rainey Harper became the university's first president in 1891, and the first lectures were held in 1892. Both Harper and future president Robert Maynard Hutchins advocated that Chicago's curriculum should be based on theory and perennial issues rather than applied science and commercial gain. With Harper's vision in mind, the University of Chicago also became one of the 14 founding members in 1900 of the Association of American Universities, an international association of leading research universities.

**Question 0**

Which association founded the University of Chicago?

**Question 1**

Which person made a donation to help set up the school?

**Question 2**

Who was the first president of the University of Chicago?

**Question 3**

In what year did the university's first president take office?

**Question 4**

What year was the first course held at the University of Chicago?

**Question 5**

Who is known as the poorest man in history?

**Question 6**

What year was Maynard University founded?

**Question 7**

In what year did Robert Harper become the first president of the university?

**Question 8**

In what year did U of C become one of the seven founding members of the University of Chicago Association?

**Question 9**

What year was the last university lectures held?

**Text number 3**

The University of Chicago was founded and registered as a secular institution for coeducational students in 1890 with a donation of land donated by the American Baptist Education Society and oil magnate and philanthropist John D. Rockefeller from Marshall Field. Although the Rockefeller donation provided money for academic activities and a long-term endowment, it stipulated that these funds could not be used for buildings. The original campus was funded by donations from wealthy Chicagoans such as Silas B. Cobb. He funded the first building on campus, Cobb Lecture Hall, and matched Marshall Field's $100,000 commitment. Other early benefactors included businessmen Charles L. Hutchinson (trustee, treasurer and donor to Hutchinson Commons), Martin A. Ryerson (chairman of the board of trustees and donor to Ryerson Physical Laboratory), Adolphus Clay Bartlett and Leon Mandel, who funded the construction of the gymnasium and meeting hall, and Walker Museum director George C. Walker, a Cobb relative who encouraged him to make the first donation for the facilities.

**Question 0**

Who donated property to the University of Chicago?

**Question 1**

Who helped pay for the construction of the first university building?

**Question 2**

What was the name of the first building on the campus?

**Question 3**

How much did Silas B. Cobb pledge to the university?

**Question 4**

What is the name of the donor who helped set up Hutchinson Commons?

**Question 5**

In what year did the Walker Museum create and incorporate the U of C as a coeducational institution?

**Question 6**

What year did Clay Bartlett donate the Marshall Field land?

**Question 7**

Who funded the original board?

**Question 8**

George C. Walker was a trustee, treasurer and donor to which organisation?

**Question 9**

It was outlined that whose donations can only be used for buildings?

**Text number 4**

In the 1890s, the University of Chicago, fearing that its vast resources would harm smaller schools by drawing away good students, joined several regional colleges and universities: Des Moines College, Kalamazoo College, Butler University and Stetson University. In 1896, the university joined Shimer College in Mount Carroll, Illinois. Under the terms of the affiliation, the schools were required to have courses of study equivalent to those of the University, to notify the University early of any proposed faculty appointments or dismissals, not to appoint faculty without University approval, and to send copies of examinations for proposals. The University of Chicago agreed to award a diploma to any graduate of the combined school who received an A grade in all four years and to any other graduate who completed 12 weeks of additional study at the University of Chicago. A student or faculty member of the merged school was entitled to free tuition at the University of Chicago, and Chicago students were entitled to study at the merged school under the same conditions and receive credit for their coursework. The University of Chicago also agreed to provide the affiliated schools with books and scientific equipment and supplies at cost, special teachers and lecturers at no cost except travel expenses, and one copy of each book and journal published by the University of Chicago Press at no cost. The agreement provided that either party may terminate the affiliation agreement by giving appropriate notice. Several professors at the University of Chicago did not like the programme because it meant additional work for them without compensation and because they believed it would degrade the academic reputation of the university. The program was consigned to history by 1910.

**Question 0**

Who did the university decide to ally with in 1890?

**Question 1**

What year did the university ally with Shimer College?

**Question 2**

The university agreed to award a degree to every graduate affiliate scholar who did what?

**Question 3**

Who didn't like the Partnership?

**Question 4**

What year did the Partnership end?

**Question 5**

In which decade did the U of C join the numerous national universities?

**Question 6**

Where in Illinois is Shimer University located?

**Question 7**

To which schools did the U of C promise to provide books and supplies for free?

**Question 8**

What year did U of C join Kalamazoo College in Mount Carroll?

**Text number 5**

In 1929, the university's fifth president, Robert Maynard Hutchins, took office; the university underwent many changes during his 24-year tenure. Hutchins eliminated varsity football from the university in an attempt to emphasize academics over athletics, introduced an undergraduate liberal arts curriculum known as Common Core, and organized the university's graduate work into its current[when?] four departments. In 1933, Hutchins proposed the failed plan to merge the University of Chicago and Northwestern University into a single university. During his tenure, the University of Chicago Hospitals (now the University of Chicago Medical Center) completed construction and enrolled its first medical students. The Committee on Social Ideas, a university institution, was also created.

**Question 0**

Who was the fifth president of the university?

**Question 1**

In what year did the 5th president of the university take office?

**Question 2**

How long did the fifth president's term last?

**Question 3**

Why did the university's fifth president decide to abandon the football programme?

**Question 4**

What was the name given to the liberal arts curriculum of the undergraduate college?

**Question 5**

What year did the fourth President Robert Maynard Hutchins take office?

**Question 6**

What did the university experience during Hutchins' 33-year tenure?

**Question 7**

Why did Hutchins remove hospitals from the university?

**Question 8**

What year did Hutchins propose a plan to combine the U of C and Common Core?

**Question 9**

Under whose tenure was the Chicago University Hospitals system destroyed?

**Text number 6**

In the early 1950s, student applications declined due to increased crime and poverty in the Hyde Park area. In response, the University became a major sponsor of the controversial urban renewal project in Hyde Park, which profoundly affected both the neighborhood's architecture and street plan. During this period, the University, like Shimer College and 10 other universities, introduced an early entrance program that allowed very young students to enter college; in addition, students enrolled at Shimer could automatically transfer to the University of Chicago after their second year after completing equivalent or similar exams and courses.

**Question 0**

What was the first year in which the number of applications fell?

**Question 1**

Why did the number of university applicants fall?

**Question 2**

When were Shimer College students allowed to transfer to the University of Chicago?

**Question 3**

Which part of the city was the urban renewal project intended to help?

**Question 4**

What did the Early Help programme do for potential students?

**Question 5**

During which decade did the number of student applications increase?

**Question 6**

Why did student applications increase in the 1950s?

**Question 7**

What happened to the number of student applications in the 1920s?

**Question 8**

Student numbers increased as a result of increased crime and poverty in which region?

**Question 9**

What did Shimer College and 10 other schools accept as Hyde Park University?

**Text number 7**

The university experienced its share of student unrest in the 1960s, starting in 1962 when students occupied President George Beadle's office in protest against off-campus leasing practices. After continued unrest, a university committee published the so-called Kalven Report in 1967. The report, a two-page statement of the university's policy on "social and political activities", stated that "in order to carry out its mission in society, the University must maintain an exceptionally free research environment and preserve its independence from political fashions, passions and pressures". The report has since been used to justify decisions such as the university's refusal to divest from South Africa in the 1980s and from Darfur in the late 2000s.

**Question 0**

What year did the student decide to run for president?

**Question 1**

What made a student decide to occupy the President's office in protest?

**Question 2**

In what year was the Kalven report published?

**Question 3**

How many pages was the Kalven report statement?

**Question 4**

What kind of policies did the Kelven report contain?

**Question 5**

During which decade did the university experience a student rest?

**Question 6**

Who was the vice-president in 1962?

**Question 7**

Whose office was occupied by students protesting against rent policy in 1965?

**Question 8**

What year was the Darfur report published?

**Question 9**

In which year was the three-page Kalven report published?

**Text number 8**

Since the mid-2000s, the university has embarked on several multi-million dollar expansion projects. In 2008, the University of Chicago announced plans to establish the Milton Friedman Institute, which sparked both support and controversy among faculty members and students. The institute will cost about $200 million and will be housed in the Chicago Theological Seminary buildings. That same year, investor David G. Booth donated $300 million to the university's Booth School of Business, the largest donation in the university's history and the largest donation ever to any business school. In 2009, several new buildings were under design or construction, half of which cost $100 million or more. Since 2011, major construction projects have included the Jules and Gwen Knapp Center for Biomedical Discovery, a 10-story medical research center, and additions to the University of Chicago Medical Center's medical campus. In 2014, the university launched the public phase of a $4.5 billion fundraising campaign. In September 2015, the University received $100 million from the Pearson Family Foundation to establish the Pearson Institute for the Study and Resolution of Global Conflicts and the Pearson Global Forum at the Harris School of Public Policy Studies.

**Question 0**

When did the university decide to embark on a multi-million euro expansion project?

**Question 1**

Which institute did the university announce to everyone in 2008?

**Question 2**

Approximately how much did the Milton Friedman Institute cost?

**Question 3**

In which buildings was the Milton Friedman Institute located?

**Question 4**

Who decides to make a very large donation to the University's Booth School of Business?

**Question 5**

In which decade did the university embark on expansion projects costing several thousand dollars?

**Question 6**

When were the plans for the Harris Friedman Institute announced?

**Question 7**

How much is the Milton Friedman Institute estimated to cost for the Chicago Business Booth?

**Question 8**

Who donated half a billion dollars to the University's Booth School of Business?

**Question 9**

What year did Pearson Friedman donate $300 million to the Booth School of Business?

**Text number 9**

The first buildings on the University of Chicago campus, forming what is now known as the Main Quadrangles, were part of a "master plan" drawn up by two University of Chicago trustees and designed by Chicago architect Henry Ives Cobb. The Main Quadrangles consists of six quadrangles, each of which is surrounded by buildings that border one larger square. Cobb, Shepley, Rutan and Coolidge, Holabird & Roche and other architectural firms designed the Main Quadrangles buildings in a mixture of Victorian Gothic and Collegiate Gothic styles, modelled on the colleges of Oxford University (for example, Mitchell Tower is modelled on Oxford's Magdalen Tower, and Hutchinson Hall, the University's community college, emulates Christ Church Hall).

**Question 0**

What are the first buildings built by the university, known today?

**Question 1**

How many quadrilaterals are there in the main block?

**Question 2**

Who helped design the main districts?

**Question 3**

Mitchell Tower is designed to resemble what Oxford Tower?

**Question 4**

Hutchinson Hall was designed to look like Oxford Hall?

**Question 5**

What are the first buildings of Oxford University?

**Question 6**

Who designed the main gothic?

**Question 7**

The other buildings at the U of C are known as what?

**Question 8**

The Main Quadrangles was part of a masterplan drawn up by how many Oxford University trustees?

**Text number 10**

After the 1940s, the Gothic style of the campus began to give way to a modern style. In 1955, Eero Saarinen was commissioned to draw up a second master plan, which led to the construction of buildings both north and south of Midway, including the Laird Bell Law Quadrangle (a complex designed by Saarinen); a series of art buildings; a building designed by Ludwig Mies van der Rohe for the university's School of Social Administration;, a building designed by Edward Durrell Stone that will become home to the Harris School of Public Policy Studies; and Regenstein Library, the largest building on campus, a brutalist building designed by Walter Netsch of the Chicago firm Skidmore, Owings & Merrill. Another master plan, designed in 1999 and updated in 2004, produced the Gerald Ratner Athletics Center (2003), the Max Palevsky Residential Commons (2001), the South Campus Residence Hall and Dining Facilities (2009), a new children's hospital, and other construction, expansion and renovation projects. In 2011, the university completed the glass-domed Joe and Rika Mansueto Library, which provides a large reading room for the university library and prevents books from being deposited off campus.

**Question 0**

In which decade did the campus start to look more modern?

**Question 1**

Who was given the task of designing the second master plan?

**Question 2**

Which administration was designed by Ludwig Mies van der Rohe?

**Question 3**

Which public policy school is housed in a building designed by Ludwig Mies van der Rohe?

**Question 4**

When was the Gerald Ratner Athletics Center built?

**Question 5**

After which decade did the modern style give way to the Gothic style on campus?

**Question 6**

In what year was Owings awarded the contract for the second master plan?

**Question 7**

What did Eero Saarinen develop in 2011?

**Question 8**

The third master plan led to the construction of buildings where?

**Question 9**

What year was Gerald Palevsky's Athletic Commons developed?

**Text number 11**

The University of Chicago also has facilities beyond its main campus. The university's Booth School of Business has campuses in Singapore, London and downtown Chicago's Streeterville neighbourhood. In Paris, The Center in Paris, a campus on the left bank of the Seine, offers a range of undergraduate and postgraduate programmes. In autumn 2010, the University of Chicago also opened a centre in Beijing, near the campus of Renmin University in the Haidian district. The most recent additions are a centre in New Delhi, India, which opened in 2014, and a centre in Hong Kong, which opened in 2015.

**Question 0**

Where else is the Booth School of Business located?

**Question 1**

Which river is near the centre of Paris?

**Question 2**

In what year did the university set up a centre in Beijing?

**Question 3**

Which school campus is next to the university campus in Beijing?

**Question 4**

What year did the university open a centre in Hong Kong?

**Question 5**

Where are the Paris School Of Business campuses located?

**Question 6**

Which campus is located on the right bank of the Seine?

**Question 7**

Which campus hosts only postgraduate programmes and is located on the banks of the Seine?

**Question 8**

What year was the oldest extension to New Delhi opened?

**Question 9**

What year was the oldest extension in Hong Kong opened?

**Text number 12**

The University of Chicago is governed by a Board of Governors. The Board oversees the long-term development and planning of the University and manages fundraising. The Board consists of 50 members, including the President of the University. Reporting directly to the President are the Provost, fourteen Vice Presidents (including the University's Chief Financial Officer, Chief Investment Officer and Dean of Students), the Directors of Argonne National Laboratory and Fermilab, the University Secretary and the Student Affairs Officer. As of August 2009[update], the Board of Trustees is chaired by Andrew Alper and the University President is Robert Zimmer. In December 2013, it was announced that Eric Isaacs, director of Argonne National Laboratory, would become president of the university. Isaacs was replaced as provost in March 2016 by Daniel Diermeier.

**Question 0**

Who runs the University of Chicago?

**Question 1**

How many people are on the university's board?

**Question 2**

How many Vice-Chairs are there on the Board?

**Question 3**

What is the name of the Chairman of the Board of Directors?

**Question 4**

Who took Isaacs' place as Provost in 2016?

**Question 5**

Who runs Zimmer University?

**Question 6**

What does the Council of Presidents oversee?

**Question 7**

What else does the Board do besides managing the student laboratories?

**Question 8**

Which body is made up of the 2009 members?

**Question 9**

Who replaced Diermeier as provost?

**Text number 13**

The academic bodies of the University of Chicago consist of a college, four postgraduate research units and seven professional schools. The University also includes a library system, the University of Chicago Press, the University of Chicago Laboratory Schools and the University of Chicago Medical Center, and has links to a number of independent academic institutions, including Fermilab, Argonne National Laboratory and the Marine Biological Laboratory. The University is accredited by the Higher Learning Commission.

**Question 0**

Who has accredited the university?

**Question 1**

The academic body of a university is made up of how many graduate departments?

**Question 2**

How many vocational schools make up the academic body of a university?

**Question 3**

How many departments of postgraduate research does the University of Higher Learning consist of?

**Question 4**

How many vocational schools does a college consist of?

**Question 5**

The U of C has links with a number of dependent institutions, including?

**Question 6**

Which commission is approved by the University of Chicago Press?

**Question 7**

What are the academic bodies of the University of Chicago Medical Center?

**Text number 14**

The College of the University of Chicago offers bachelor of arts and bachelor of science degrees in 50 majors and 28 minors. The College is divided into five divisions. The first four are the divisions of their respective degree departments, while the New Collegiate Division manages interdisciplinary majors and courses that do not fit into any of the other four divisions.

**Question 0**

How many majors does the university award in total?

**Question 1**

How many academic minors does the university award in total?

**Question 2**

How many departments make up the academic units of a university?

**Question 3**

Which department has more than one field of study that does not fit in with the other four?

**Question 4**

The College awards Bachelor of Science and Bachelor of Arts degrees in 28 majors and how many minors?

**Question 5**

The College awards Bachelor of Science and Bachelor of Arts degrees in 50 minors and how many majors?

**Question 6**

Which University College awards majors in 30 different subjects?

**Question 7**

Which university college offers academic minors in 50 subjects?

**Question 8**

How many departments is the university of higher education divided into?

**Text number 15**

Undergraduate students must complete a certain number of courses that correspond to the university's core curriculum, known as the Common Core. In 2012-2013, Chicago limited the number of Common Core courses to 17 students, usually taught by a full-time professor (as opposed to an adjunct). Starting in the 2013-2014 academic year, the Common Core will require 15 courses and a certified foreign language proficiency. University of Chicago undergraduate courses are known for their demanding requirements, heavy workload and academic difficulty; according to Uni in the USA magazine, "of the academic cream of American universities - Harvard, Yale, Princeton, MIT and the University of Chicago - it is UChicago that can most convincingly claim to offer the most rigorous and intensive learning experience".

**Question 0**

What is the name of the university's core curriculum?

**Question 1**

In 2012-2013, how many students were able to complete the core classes in one go?

**Question 2**

How does the learning experience at UChicago compare to other universities?

**Question 3**

According to which guide, the University of Chicago is known for its heavy workload and academic difficulties?

**Question 4**

What do undergraduate students need to do to complete the Chicago Core Curriculum?

**Question 5**

At what time were there only 15 pupils in primary classes?

**Question 6**

How many courses are required for the Core curriculum from 2017 onwards?

**Question 7**

Other than 17 classes, what is required for Core from 2013-2014?

**Question 8**

What are U of C postgraduate courses known for?

**Text number 16**

The university runs several academic departments and programmes in addition to undergraduate and postgraduate schools. It operates the University of Chicago Laboratory Schools (a private day school for K-12 students and day care), the Sonia Shankman Orthogenic School (an institutional care program for individuals with behavioral and emotional problems), and four public charter schools on Chicago's South Side, operated by the University's Urban Education Institute. In addition, Hyde Park Day School, a school for students with learning disabilities, operates on the University of Chicago campus. Since 1983, the University of Chicago has operated the University of Chicago School Mathematics Project, a mathematics program for urban elementary and middle schools. The University runs a program called the Council on Advanced Studies in the Social Sciences and Humanities, which administers interdisciplinary workshops to provide a forum for graduate students, faculty and visiting scholars to present ongoing scholarly work. The University also operates the University of Chicago Press, the largest university press in the United States.

**Question 0**

What is the name of a private day school for K-12 students run by a university?

**Question 1**

What is the name of the inpatient care programme run by the university?

**Question 2**

How many public charter schools does the university run?

**Question 3**

What does the Urban Education Institute help to run?

**Question 4**

Where is Hyde Park Day School located?

**Question 5**

What else does the university offer besides maths and postgraduate education?

**Question 6**

What is the name of a public day school and day care centre for K-12 pupils?

**Question 7**

What has the U of C preserved since 1938?

**Question 8**

What is the name of the social studies programme used in urban primary and secondary schools?

**Question 9**

What is the largest university press on the South Side?

**Text number 17**

The University of Chicago library system includes six libraries with a total of 9.8 million volumes, the 11th largest library system in the United States. The university's main library is the Regenstein Library, which contains one of the largest collections of printed volumes in the United States. Built in 2011, the Joe and Rika Mansueto Library has a large study area and an automated book storage and retrieval system. The John Crerar Library holds more than 1.3 million volumes in the biological, medical and physical sciences, as well as collections in general science, philosophy of science, medicine and technology, and history. The university also has several specialised libraries, including the D'Angelo Law Library, the Social Administration Library and the Eckhart Library of Mathematics and Computer Science, which was temporarily closed for renovation on 8 July 2013. The Harper Memorial Library no longer has staples; however, in addition to the Regenstein Library, it is a 24-hour study space on campus.

**Question 0**

What is the total number of libraries in the University of Chicago Library System?

**Question 1**

How many volumes are there in the University of Chicago library system?

**Question 2**

What is the name of the main university library?

**Question 3**

What year was Joe and Rika Mansueto's library built?

**Question 4**

Approximately how many volumes are in John Crerar's library?

**Question 5**

Which university library system has 12 libraries?

**Question 6**

Which university library system has more than 10 million book collections?

**Question 7**

Which university ranks 9th in terms of the number of volumes in the United States?

**Question 8**

What year was the D'Angelo and Rika library built?

**Text number 18**

The university has 12 research institutes and 113 research centres. These include the Oriental Institute - a museum and research centre for Middle Eastern studies owned and run by the University - and several national resource centres, including the Middle East Research Centre. Chicago also has a number of research institutes that operate or are affiliated with a number of research institutes outside the university itself. The University partially operates Argonne National Laboratory, part of the US Department of Energy's National Laboratory System, and has an affiliation with the nearby particle physics laboratory Fermilab and an affiliation with the Apache Point Observatory in Sunspot, New Mexico. In 2013, the university announced that it will affiliate the formerly independent Marine Biological Laboratory in Woods Hole, Massachusetts. The National Opinion Research Center, which is not formally affiliated but is located on the Chicago campus, is located on the Chicago campus.

**Question 0**

How many research institutes does the university maintain on campus?

**Question 1**

How many research centres does the university have on campus?

**Question 2**

What is the name of the Museum and Research Centre for Middle Eastern Studies, owned by the University?

**Question 3**

In which laboratory does the university have a joint contribution?

**Question 4**

Where is the Apache Point Observatory located?

**Question 5**

How many research centres does the U of C have in addition to 113 research institutes?

**Question 6**

How many research institutes does the U of C have in addition to the 12 research centres?

**Question 7**

Which institute is the Centre for Middle East Studies?

**Question 8**

Which city in Illinois is home to a marine biology laboratory?

**Question 9**

On which Woods Hole campus is the National Opinion Research Center located?

**Text number 19**

There have been some significant experiments and academic movements at the University of Chicago. In economics, the University has played an important role in shaping free market ideas and is the namesake of the school of economic thought advocated by Milton Friedman and other economists, the Chicago School of Economics. The University's Department of Sociology was the first independent sociology department in the United States and gave birth to the Chicago School of Sociology. In physics, the university performed Chicago Pile-1 (the first man-made self-sustaining nuclear reaction, part of the Manhattan Project), Robert Millikan's oil drop experiment to calculate the charge of an electron, and Willard F. Libby developed radiocarbon dating in 1947. The Miller-Urey chemical experiment, which tested how life arose in the early days of the Earth, was carried out at the University. Nathaniel Kleitman and Eugene Aserinsky discovered REM sleep at the university in 1953.

**Question 0**

What was the role of the university in economics?

**Question 1**

What was the name of the first human self-sustaining nuclear reaction?

**Question 2**

What was the name of the experiment that tested how life was born?

**Question 3**

When was REM sleep discovered?

**Question 4**

Why was the Kleitman-Aserinsky test done?

**Question 5**

When was the Miller-Urey test done?

**Question 6**

What kind of dream was discovered at the U of C in 1947?

**Question 7**

What was the name of an experiment to test early life on Mars?

**Question 8**

Where did the Chicago School of Psychology come from?

**Text number 20**

UChicago's arts program is affiliated with academic departments and programs in the Department of Humanities and the College, as well as professional organizations such as Court Theatre, Oriental Institute, Smart Museum of Art, Renaissance Society, University of Chicago Presents, and student arts organizations. The university has an artist residency program and scholars in performance studies, contemporary art criticism and film history. The university has offered doctorates in music composition since 1933 and in film and media studies since 2000, a master of fine arts in visual arts (early 1970s) and a master of arts in creative writing (2000). It has offered Bachelor of Fine Arts, Bachelor of Music and Bachelor of Art History degree programmes, and more recently, Bachelor of Cinema and Media Studies (1996) and Bachelor of Theatre and Performance Studies (2002). The College's general education curriculum includes a "Drama, Music and Visual Arts" requirement that students must study art history, performing arts or begin working in sculpture. Several thousand majors and minors enrol in creative and performing arts courses each year. UChicago is often considered the birthplace of improvisational comedy, as the Compass Players student comedy group evolved into The Second City improvisational theatre company in 1959. The Reva and David Logan Center for the Arts opened in October 2012, five years after alumni David Logan and his wife Reva donated $35 million. The centre has spaces for exhibitions, performances, courses and media production. The Logan Center was designed by Tod Williams and Billie Tsien. This building is actually all glass. The brick is the facade, designed to protect the glass from the wind. The architects later removed parts of the brick after complaints that views of the city were blocked.

**Question 0**

Since when did the university offer a doctorate in music composition?

**Question 1**

Since when has the university offered a PhD in Film and Media Studies?

**Question 2**

When did the university launch the Bachelor of Arts in Film and Media Studies?

**Question 3**

When did the university start the Bachelor of Arts in Theatre and Performance Studies?

**Question 4**

How many students enrol in creative and performing arts classes each year?

**Question 5**

What doctoral programmes have been offered since 1996?

**Question 6**

Does the university offer Master's programmes in visual arts, music and what other subjects?

**Question 7**

Does the university have Bachelor of Fine Arts programmes in Fine Arts and in which other subject?

**Question 8**

What are the requirements for a common core college?

**Question 9**

What year was the Williams and Logan Center opened?

**Text number 21**

In the September quarter of 2014, the University of Chicago enrolled 5,792 students in college, 3,468 students in its four graduate departments, 5,984 students in its professional schools, and 15,244 students in total. In spring quarter 2012, international students made up nearly 19 percent of all students, more than 26 percent of students were domestic ethnic minorities, and about 44 percent of students were female. The University of Chicago is highly selective in admitting students. The 50 percent average SAT scores for undergraduate students in 2015, excluding the writing section, ranged from 1420 to 1530, the average MCAT score for students admitted to the Pritzker School of Medicine in 2011 was 36, and the median LSAT score for students admitted to the Law School in 2011 was 171. In 2015, the College of the University of Chicago's acceptance rate for the Class of 2019 was 7.8 percent, the lowest in high school history.

**Question 0**

How many students enrolled in the college in the autumn quarter of 2014?

**Question 1**

How many students enrolled in the four postgraduate departments of the university in the autumn quarter of 2014?

**Question 2**

How many students enrolled in university vocational schools in the autumn quarter of 2014?

**Question 3**

What was the total number of students enrolled at the university in the autumn quarter of 2014?

**Question 4**

Who were 19% of students in the spring 2012 quarter?

**Question 5**

How many students enrolled in the college in spring 2014?

**Question 6**

The university enrolled 3,468 students at the College and how many of it has graduate departments?

**Question 7**

How many students did the university enrol in its five postgraduate departments in 2014?

**Question 8**

The university enrolled 5 984 students in higher education and how many in its vocational schools?

**Question 9**

What year was the College's approval rate the highest in its history?

**Text number 22**

The Maroons compete in NCAA Division III as a member of the University Athletic Association (UAA). The university was a founding member of the Big Ten Conference and participated in the NCAA Division I men's basketball and football leagues and was a regular participant in the men's basketball tournament. In 1935, the University of Chicago qualified for the Sweet Sixteen Tournament. In 1935, Chicago Maroons football player Jay Berwanger became the first Heisman Trophy winner. However, the university decided to withdraw from the conference in 1946 after university president Robert Maynard Hutchins downgraded college sports in 1939 and abandoned football (in 1969, Chicago took back football as a Division III team and resumed playing its home games at the new Stagg Field).

**Question 0**

The Maroons are part of what association?

**Question 1**

The Maroons compete in which league?

**Question 2**

Which conference was the university a founding member of?

**Question 3**

Which player won the first Heisman Trophy for a university?

**Question 4**

Why did the university finally leave the conference?

**Question 5**

What kind of member of what university is the Big Twelve Conference?

**Question 6**

When did the university get into Sweet Seventeen?

**Question 7**

When did Robert Hutchins become the first Heisman Trophy winner?

**Question 8**

When did Jay Berwanger win the Maynard Trophy?

**Question 9**

Where did the President re-emphasise athletics at university?

**Text number 23**

University of Chicago students have more than 400 clubs and organizations known as Recognized Student Organizations (RSOs), including cultural and religious groups, academic clubs and teams, and non-profit organizations. Notable extracurricular groups include the University of Chicago College Bowl team, which has won 118 tournaments and 15 national championships, and is the leader in both categories internationally. The University's competitive Model United Nations team was the best team in North America in 2013-14 and 2014-15. Notable RSOs include Doc Films, the longest continuously operating student film society in the country, the organizing committee for the University of Chicago Scavenger Hunt, the bi-weekly student newspaper The Chicago Maroon, the alternative weekly student newspaper South Side Weekly, the second oldest continuously operating student improvisational theatre group in the country, Off-Off Campus, and the university-owned radio station WHPK.

**Question 0**

How many clubs are there at the university?

**Question 1**

What is the name of the organisation responsible for running the clubs at the university?

**Question 2**

Which club won 118 tournaments and 15 national championships?

**Question 3**

What is the name of the longest continuously running student film association in the country?

**Question 4**

What is the name of the student improvisation theatre group?

**Question 5**

How many clubs are run by Model United Nations students?

**Question 6**

What is the common name of the club run by more than 118 students at the U of C?

**Question 7**

When was the RSO Nations the number one team in North America?

**Question 8**

When did the Model United Nations team finish second in North America?

**Question 9**

During which years was the Model United Nations team the number one team in South America?

**Text number 24**

The University of Chicago Student Government funds all recognized student organizations, from the University of Chicago Scavenger Hunt to Model UN, in addition to academic teams, sports clubs, art groups and other organizations. The Student Government is made up of graduate and undergraduate students elected to represent members of their academic units. It is governed by an Executive Committee, chaired by the President and assisted by two Vice-Presidents, one responsible for administration and the other for student life, who are elected jointly by the Students' Union in the spring. It has an annual budget of more than $2 million.

**Question 0**

Who are the members of the Student Union Board?

**Question 1**

Who runs the Student Union Board?

**Question 2**

How many vice-presidents are there on the student union board?

**Question 3**

How big is the budget of the Student Union?

**Question 4**

Which organisations are funded by the Student Union?

**Question 5**

What types of students make up the Chicago Board?

**Question 6**

Who are the members of the sports club chosen to represent?

**Question 7**

The Student Government is led by the President and who chairs it?

**Question 8**

What is the annual budget for the Scavenger Hunt?

**Text number 25**

The University of Chicago has fifteen fraternities and seven sororities, plus one community service fraternity, Alpha Phi Omega. Four of the sororities are members of the National Panhellenic Conference, and ten sororities make up the University of Chicago Interfraternity Council. In 2002, the Associate Director of Fraternity and Sorority Activities estimated that 8-10 percent of students belonged to fraternities. The Office of Student Activities used similar figures and found that one in ten students participate in Greek life.

**Question 0**

How many fraternities are there at the university?

**Question 1**

How many sister universities are there?

**Question 2**

What is the name of the Brotherhood of Shared Services?

**Question 3**

How many sister regions are members of the National Panhellenic Conference?

**Question 4**

How many fraternities make up the Interfraternity Council of the University of Chicago?

**Question 5**

How many fraternities are there in the U of C in addition to the 15 sisterhoods?

**Question 6**

How many sisterhoods does the U of C have in addition to the 7 sisterhoods?

**Question 7**

What are the ten sisterhoods?

**Question 8**

What are the four brotherhoods?

**Question 9**

What year did Alpha Phi Omega estimate that about 10% of students participated in sororities/fraternities?

**Text number 26**

Since 1987, the University of Chicago has held a University of Chicago Scavenger Hunt every May, in which large teams of students compete to get their hands on a list of notoriously esoteric items. Since 1963, the Festival of the Arts (FOTA) has taken over the campus for 7-10 days with exhibitions and interactive art events. Every January, the university organises a week-long winter festival, Kuviasungnerk/Kangeiko, which includes morning jogging and fitness workshops. The university also organises an annual summer carnival and a concert called Summer Breeze, featuring outside musicians, and hosts Doc Films, a student film society founded in 1932 that shows films every night at the university. Since 1946, the university has hosted the Latke-Hamantash Debate, a humorous discussion of the relative merits and meanings of latke and hamantashen.

**Question 0**

What month is the university scavenger hunt?

**Question 1**

In what year did the treasure hunt start?

**Question 2**

What does FOTA stand for?

**Question 3**

What is the name of the fitness-based winter festival in January?

**Question 4**

What is the name of the University Summer Festival?

**Question 5**

What has been organised at the university since 1963, with large groups looking for items from the list?

**Question 6**

What has been organised since 1987, when the campus was occupied for 7-10 days by exhibitions?

**Question 7**

What is always held in February at the university?

**Question 8**

What is the name of the university's winter carnival and concert?

**Question 9**

Which debate has been organised by the U of C since 1987?

**Text number 27**

Notable business alumni include Microsoft CEO Satya Nadella, Oracle Corporation founder and America's third richest man Larry Ellison, Goldman Sachs and MF Global CEO and former New Jersey Governor Jon Corzine, McKinsey & Company founder and author of the first management accounting textbook James O. McKinsey, Arley D. Cathey, Bloomberg L.P. CEO Daniel Doctoroff, Credit Suisse CEO Brady Dougan, Morningstar, Inc. founder and CEO Joe Mansueto, Chicago Cubs owner and chairman Thomas S. Ricketts, and NBA Commissioner Adam Silver.

**Question 0**

Which Microsoft CEO is also a University of Chicago alumni?

**Question 1**

Who was the founder of Oracle Corporation?

**Question 2**

Who is the third richest man in America?

**Question 3**

Which Goldman Sachs CEO is also a University of Chicago alumni?

**Question 4**

Who founded McKinsey & Company?

**Question 5**

Who is the founder of Microsoft and the third richest man in America?

**Question 6**

Who is the CEO of Microsoft and also served as Governor of NJ?

**Question 7**

Who is the founder of the Chicago Cubs and author of the first management accounting textbook?

**Question 8**

Who is the Chairman of Microsoft and Commissioner of the NBA?

**Question 9**

Who is the CEO of Microsoft and MF Global?

**Text number 28**

Notable alumni in government and politics include Saul Alinsky, founder of modern community organizing; David Axelrod, Obama campaign adviser and top political adviser to President Bill Clinton; Attorney General and federal judge Robert Bork; Attorney General Ramsey Clark; Prohibition agent Eliot Ness and Supreme Court Justice John Paul Stevens; Canadian Prime Minister William Lyon Mackenzie King; Polish 11th Circuit Court of Appeals; and the late President of the United States. Prime Minister Marek Belka, Governor of the Bank of Japan Masaaki Shirakawa, the first African-American female Senator Carol Moseley Braun, US Senator from Vermont and 2016 Democratic presidential candidate Bernie Sanders, and former World Bank President Paul Wolfowitz.

**Question 0**

Who is the founder of modern community organisation?

**Question 1**

Which alumni was also an adviser to the Obama campaign?

**Question 2**

Which alumni was also Attorney General and a federal judge?

**Question 3**

Which alumni is also the Governor of the Bank of Japan?

**Question 4**

Which prohibition agent was also a university alumnus?

**Question 5**

Who is the Attorney General and adviser to the Obama campaign?

**Question 6**

Who is both the Minister of Justice and the President's top political adviser?

**Question 7**

Who is the 12th Prime Minister of Poland?

**Question 8**

Who is the President of the European Central Bank?

**Question 9**

Who is the first Japanese senator?

**Text number 29**

In literature, Lauren Oliver, author of the New York Times bestseller Before I Fall, Pulitzer Prize-winning author Philip Roth, Canadian-born Pulitzer Prize-winning and Nobel Prize-winning author Saul Bellow, political philosopher, literary critic and author of the New York Times bestseller The Closing of the American Mind, Allan Bloom, "The Good War" author Studs Terkel, American novelist, essayist, film director, teacher and political activist Susan Sontag, analytical philosopher and Stanford University professor of comparative literature Richard Rorty, and American novelist and satirist Kurt Vonnegut are notable alumni.

**Question 0**

Which alumni member also wrote the bestseller Before I Fall?

**Question 1**

What is the name of a Pulitzer Prize-winning author who was also an alumnus of the university?

**Question 2**

Which alumni wrote "The Closing of the American Mind"?

**Question 3**

Which alumni wrote "The Good War"?

**Question 4**

What is the name of an American writer and satirist who is also an alumnus of the university?

**Question 5**

Who won both the Pullitzer Prize and the Nobel Prize?

**Question 6**

Who wrote the American Times bestseller "The Closing of the American Mind"?

**Question 7**

Who wrote "American war"?

**Question 8**

Who wrote the book "Before I Fall", which was a university bestseller?

**Question 9**

Who wrote "The End of the Good War"?

**Text number 30**

The arts and entertainment graduates include minimalist composer Philip Glass, dancer, choreographer and dance anthropologist Katherine Dunham, Bungie founder and Halo video game series developer Alex Seropian, Serial presenter Sarah Koenig, actor Ed Asner, Pulitzer Prize-winning film critic and subject of the 2014 documentary Life Itself Roger Ebert, director, writer and comedian Mike Nichols, film director and screenwriter Philip Kaufman, and photographer and writer Carl Van Vechten.

**Question 0**

Which minimalist composer is also a university graduate?

**Question 1**

What is the name of the founder of Bungie Inc, who is also a university graduate?

**Question 2**

Which video game series did Alex Seropian make?

**Question 3**

Which American actor is also a university graduate?

**Question 4**

Which comedian is also a university graduate?

**Question 5**

Who is the founder of Bungie and developer of the dance video game?

**Question 6**

Who is an actor and also a series presenter?

**Question 7**

Who is an award-winning photographer and writer?

**Question 8**

Who directed life itself?

**Text number 31**

In science, alumni include astronomers Carl Sagan, a major contributor to the scientific study of extraterrestrial life, Edwin Hubble, known as "Hubble's Law", NASA astronaut John M. Grunsfeld, geneticist James Watson, best known as one of the discoverers of the structure of DNA, experimental physicist Luis Alvarez, popular environmentalist David Suzuki, balloonist Jeannette Piccard, biologists Ernest Everett Just and Lynn Margulis, computer scientist Richard Hamming, creator of the Hamming code, lithium-ion battery developer John B. Goodenough, mathematician and Fields Medal winner Paul Joseph Cohen, and geochemist Clair Cameron Patterson, who developed the uranium-lead dating method into the lead-lead method. Nuclear physicist and scientist Stanton Friedman, who worked on some of the early projects on nuclear-powered spacecraft propulsion systems, has also graduated (M.Sc.).

**Question 0**

Which astronomer is also an alumni member of the university?

**Question 1**

Which NASA astronaut is also a university alumni?

**Question 2**

Which popular environmental activist is also a university alumni?

**Question 3**

Who developed the lithium-ion battery?

**Question 4**

Which geochemist developed the uranium-lead dating method into a lead-lead dating method?

**Question 5**

Which astronomer is an alumnus of the Hamming Code?

**Question 6**

Which DNA astronaut is also a U of C alumni?

**Question 7**

Who developed the Hamming battery?

**Question 8**

Who developed the lithium-ion battery that gave lead-lead dating?

**Text number 32**

In economics, notable winners of the Nobel Memorial Prize in Economics include Milton Friedman, a major advisor to US Republican President Ronald Reagan and British Conservative Prime Minister Margaret Thatcher; George Stigler, Nobel laureate and proponent of the theory of regulatory capture; Gary Becker, a major contributor to the economics of family economics; Herbert A. Simon, responsible for the modern interpretation of the concept of organizational decision making, Paul Samuelson, the first American to win the Nobel Memorial Prize in Economics, and Eugene Fama, known for his work on portfolio theory, asset pricing and stock market behavior, are all graduates. Thomas Sowell, an American economist, social theorist, political philosopher and writer, is also a graduate.

**Question 0**

Which winner of the Nobel Memorial Prize in Economics is also a university alumni?

**Question 1**

Which adviser to the British Prime Minister is also a university alumni?

**Question 2**

Who was the first American to win the Nobel Memorial Prize in Economics?

**Question 3**

Which university alumni member was known for his work on portfolio theory?

**Question 4**

Who is an alumnus of the British Nobel Memorial Prize?

**Question 5**

Which US Prime Minister is an alumnus?

**Question 6**

Who is known for working on portfolio capture theory?

**Question 7**

Name the British economist, theorist and philosopher who is also an author and an alumnus?

**Question 8**

Who was responsible for the ancient interpretation of organisational decision-making?

**Text number 33**

Other well-known alumni include anthropologists David Graeber and Donald Johanson, best known for discovering the fossil of a female hominid known as "Lucy" in the Afar Triangle, psychologist John B. Watson, the American psychologist who founded the psychological school of behaviorism, communication theorist Harold Innis, chess grandmaster Samuel Reshevsky, and conservative international relations scholar and White House National Security Council security planning coordinator Samuel P. Huntington.

**Question 0**

Which anthropologists are also alumni members of the university?

**Question 1**

Which chess grandmaster is also a university alumnus?

**Question 2**

Which conservative international relations scholar is also a university alumnus?

**Question 3**

Who is best known for uncovering the John B Watson fossil?

**Question 4**

Who did John B Watson and David Graeber find a fossil of?

**Question 5**

Who found the male fossil known as Lucy?

**Question 6**

Who is the White House Security Planning Coordinator and also an anthropologist?

**Question 7**

Who founded the psychological school of conservative international relations?

**Text number 34**

Notable physics teachers have included A. A. Michelson, the calculator of the speed of light, Robert A. Millikan, the discoverer of the Compton effect Arthur H. Compton, the creator of the first nuclear reactor Enrico Fermi, the "father of the hydrogen bomb" Edward Teller, "one of the most brilliant and prolific experimental physicists of the 20th century" Luis Walter Alvarez, Murray Gell-Mann, who introduced the quark, the second female Nobel laureate Maria Goeppert-Mayer, the youngest US Nobel laureate Tsung-Dao Lee and astrophysicist Subrahmanyan Chandrasekhar.

**Question 0**

Who calculated the speed of light?

**Question 1**

Who discovered the Compton effect?

**Question 2**

Who invented the first nuclear reactor?

**Question 3**

Who is also known as the father of the hydrogen bomb?

**Question 4**

Who was the second female Nobel laureate ?

**Question 5**

Who is known for calculating the speed of nuclear reactions?

**Question 6**

Who discovered the AA Michelson effect?

**Question 7**

Who is known as the inventor of the first elementary calculator?

**Question 8**

Who is known as the father of the hydrogen atom?

**Question 9**

Who was the first female winner?

**Text number 35**

Previous teachers have also included Egyptologist James Henry Breasted, mathematician Alberto Calderón, Nobel Prize-winning economist and classical liberalism advocate Friedrich Hayek, meteorologist Ted Fujita, chemist Glenn T. Seaborg, developer of the concept of actinides and Nobel Prize-winner Yuan T. Seaborg, who has also won the Nobel Prize. Lee, Nobel Prize-winning author Saul Bellow, political philosopher and author Allan Bloom, cancer researchers Charles Brenton Huggins and Janet Rowley, astronomer Gerard Kuiper, one of the most important figures in the early development of linguistics Edward Sapir and the founder of McKinsey & Co, James O. McKinsey.

**Question 0**

Which Egyptologist was also a member of the university faculty?

**Question 1**

Which mathematician was also a member of the university faculty?

**Question 2**

Which meteorologist was also part of the university faculty?

**Question 3**

Who developed the actinide concept?

**Question 4**

Which cancer researchers were also part of the university faculty?

**Question 5**

Who is a Nobel Prize-winning author?

**Question 6**

Who is the founder of T. Seaborg and Co?

**Question 7**

Who is the developer of the McKinsey concept?

**Question 8**

Which Nobel Prize winners are former members of the faculty?

**Question 9**

Who was a political philosopher, mathematician, writer and also a former faculty member?

**Text number 36**

The current faculty includes anthropologist Marshall Sahlins, historian Dipesh Chakrabarty, paleontologists Neil Shubin and Paul Sereno, evolutionary biologist Jerry Coyne, Nobel Prize-winning physicist Yoichiro Nambu, Nobel Prize-winning physicist James Cronin, Nobel Prize-winning economists Eugene Fama, James Heckman, Lars Peter Hansen, Roger Myerson and Robert Lucas, Jr, Freakonomics author and renowned economist Steven Levitt, current Governor of the Reserve Bank of India Raghuram Rajan, 74th Governor of the United States of America, and many others. Treasury Secretary and former Goldman Sachs CEO Hank Paulson, former Chairman of President Barack Obama's Council of Economic Advisers Austan Goolsbee, Shakespeare scholar David Bevington, and renowned political scientists John Mearsheimer and Robert Pape.

**Question 0**

Hank Paulson is the former Chairman and CEO of which banking firm?

**Question 1**

Who is the Governor of the Reserve Bank of India?

**Question 2**

Who is the current Shakespeare scholar on the university faculty?

**Question 3**

What well-known political scientists are currently on the university's faculty?

**Question 4**

What are the current number of paleontologists in the university faculty?

**Question 5**

Who is the current CEO and Chairman of Goldman Sachs?

**Question 6**

Who is the current chair of President Barack Obama's Council of Economic Advisers?

**Question 7**

Who runs the Nobel Prize-winning central bank?

**Question 8**

Who wrote Freakonomics and is also an anthropologist?

**Question 9**

Who is the 75th US Secretary of the Treasury?

**Document number 466**

**Text number 0**

The Yuan dynasty (Chinese 元朝; pinyin: Yuán Cháo), officially the Great Yuan (Chinese 大元; pinyin: Dà Yuán; Mongolian Yehe Yuan Ulus[a]), was an empire or ruling dynasty of China founded by Kublai Khan, leader of the Mongol Borjigin clan. Although the Mongols had ruled territories including present-day northern China for decades, Kublai Khan did not formally declare the dynasty in traditional Chinese style until 1271. His kingdom was by then isolated from the other Khanates and ruled over most of modern China and surrounding areas, including present-day Mongolia and Korea. It was the first foreign dynasty to rule all of China and lasted until 1368, after which its Genghis dynasty rulers returned to their Mongol homeland and continued to rule the northern Yuan Dynasty. Some of the Mongol emperors of the Yuan mastered Chinese, while others used only their native language (i.e. Mongolian) and the Phags-pa script.

**Question 0**

What is the Chinese name for the Yuan Dynasty?

**Question 1**

What is the official name of the Yuan Dynasty?

**Question 2**

Who started the Yuan Dynasty?

**Question 3**

Who led the Mongolian Borjigin clan?

**Question 4**

When did Khan officially declare the Yuan Dynasty?

**Question 5**

What is the Japanese name for the Yuan Dynasty?

**Question 6**

What is the unofficial name of the Yuan Dynasty?

**Question 7**

Who ended the Yuan Dynasty?

**Question 8**

Who abandoned Mongolia's Borjigin clan?

**Question 9**

When did Khan officially abandon the Yuan Dynasty?

**Text number 1**

The Yuan Dynasty is considered both the successor to the Mongol Empire and the imperial dynasty of China. It was a Khanate ruled by the successors of the Möngke Khan after the split of the Mongol Empire. In official Chinese historiography, the Yuan Dynasty carried the Mandate of Heaven, which succeeded the Song Dynasty and preceded the Ming Dynasty. The dynasty was founded by Kublai Khan, but he placed his grandfather in the imperial registers of Genghis Khan as the official founder of the dynasty under the name Taizu.[b] In the Declaration of the Dynasty's Name (《建國號詔》), Kublai proclaimed the new dynasty's name as the Great Yuan and claimed the succession of the former Chinese dynasties from the Three Rulers and Five Emperors to the Tang Dynasty.

**Question 0**

Which non-Chinese empire did the Yuan Dynasty succeed as the successor to the Yuan Dynasty?

**Question 1**

Which dynasty preceded the Yuan Dynasty?

**Question 2**

Which dynasty came after Yuan?

**Question 3**

Who was Kublai Khan's grandfather?

**Question 4**

Which non-Japanese kingdom did the Yuan Dynasty inherit?

**Question 5**

What was there before Yuan other than a dynasty?

**Question 6**

Which non-dynasty came after Yuan?

**Question 7**

Who was Kublai Khan's uncle?

**Text number 2**

In 1271, Kublai Khan adopted the name Great Yuan (Chinese: 大元; pinyin: Dà Yuán; Wade-Giles: Ta-Yüan) and founded the Yuan Dynasty. "Dà Yuán" (大元) is from the phrase "大哉乾元" (dà zai Qián Yuán / "Great is Qián, primitive") in the commentary section on Qián (乾) in the Classical (I Ching) of the Commentaries on Qián (乾). The Mongolian equivalent was Dai Ön Ulus, also rendered as Ikh Yuan Üls or Yekhe Yuan Ulus. In Mongolian, Dai Ön (Great Yuan) is often used in conjunction with "Yeke Mongghul Ulus" (lit. "Great Mongol State"), resulting in Dai Ön Yeke Mongghul Ulus (Mongolian spelling: ), meaning "Great Yuan Great Mongol State". The Yuan Dynasty is also known as the "Mongol Dynasty" or "Chinese Mongol Dynasty", similar to the Qing Dynasty's designations of "Manchu Dynasty" or "Chinese Manchu Dynasty". In addition, Yuan is sometimes known as the 'Great Khanate' or 'Great Khanate', which appeared especially on some Yuan maps because Yuan emperors nominally held the title of Great Khan. However, both terms can also refer to the Khanate within the Mongol Empire, which was ruled by the Grand Khanates immediately before the actual Yuan Dynasty was established by Kublai Khan in 1271.

**Question 0**

When did Khan establish the Great Yuan?

**Question 1**

What was the inspiration for the name Great Yuan?

**Question 2**

What was the Mongolian name for the Yuan Dynasty?

**Question 3**

What does Yeke Mongghul Ulus mean?

**Question 4**

What was the nominal title of the Yuan emperors?

**Question 5**

When did Khan abolish the Great Yuan?

**Question 6**

What inscription discouraged the name Great Yuan?

**Question 7**

What was the name of the Yuan Dynasty in Japanese?

**Question 8**

What does Yeke Mongghul Ulus not mean?

**Question 9**

Which nominal title did the Yuan Emperors reject?

**Text number 3**

Genghis Khan united the Mongol and Turkic tribes of the steppes and became a great king in 1206. He and his successors expanded the Mongol empire throughout Asia. Under Genghis' third son, Ögedei Khan, the Mongols destroyed the weakened Jin dynasty in 1234 and conquered most of northern China. Ögedei offered his nephew Kublai a post in Xingzhou, Hebei. Kublai could not read Chinese, but his mother Sorghaghtani had attached several Han Chinese teachers to him from his early years. He sought advice from Chinese Buddhist and Confucian advisors. Möngke Khan succeeded Ögedei's son Güyük as grand duke in 1251. He gave his brother Kublai control of the Mongol-held areas of China. Kublai built schools for Confucian scholars, issued paper money, revived Chinese rituals and supported policies that encouraged the growth of agriculture and trade. He took Kaiping in Inner Mongolia, later renamed Shanghai, as his capital.

**Question 0**

Which tribes were united by Genghis Khan?

**Question 1**

When did Genghis Khan become the Great Khan?

**Question 2**

Who was the 3rd son of Genghis Khan?

**Question 3**

When did Mongke Khan become a grand rabbit?

**Question 4**

What was Kublai Khan's relationship with Ogedei Khan?

**Question 5**

What tribes did the Genghis Khan fight against?

**Question 6**

When did the Genghis Khan kill the Great Khan?

**Question 7**

Who was Genghis Khan's fourth son?

**Question 8**

When did Mongke Khan kill the Great Khan?

**Question 9**

What did Kublai Khan say against Ogedei Khan?

**Text number 4**

Many Han Chinese and Khitan defected to the Mongol side to fight the Yinese. Two Han Chinese leaders, Shi Tianze, Liu Heima (劉黑馬, Liu Ni) and Khitan Xiao Zhala (蕭札剌) defected and commanded three Thumens in the Mongol army. Liu Heima and Shi Tianze served the Ogodei Khan. Liu Heima and Shi Tianxiang led armies against Western Xia on behalf of the Mongols. There were 4 Han Tumen and 3 Khitan Tumen, each Tumen consisting of 10,000 soldiers. Three Khitan generals Shimobeidier (石抹孛迭兒), Tabuyir (塔不已兒) and Xiaozhacizhizhizhongxi (蕭札刺之子重喜) commanded three Khitan Tumen and four Han generals Zhang Rou, Yan Shi, Shi Tianze and Liu Heima commanded four Han thumans under Ogödei Khan.

**Question 0**

Who did the Han Chinese want to help against the Mongols?

**Question 1**

Which Khitan leader defected to the Mongols?

**Question 2**

Which Han Chinese leader defected to the Mongols?

**Question 3**

How many soldiers were in each Tumen?

**Question 4**

How many Khitan Tumen were there?

**Question 5**

Who did the Han Japanese want to help against the Mongols?

**Question 6**

Which Khitan leader abandoned the Mongols?

**Question 7**

Which Han Chinese leader fought off the Mongols?

**Question 8**

How many armies were there in each Tumen?

**Question 9**

How many Khitan Tumen were there not?

**Text number 5**

Shi Tianze was a Han Chinese who lived during the Jin Dynasty. Interracial marriages between Han and Jurchen became common at that time. His father was Shi Bingzhi (史秉直, Shih Ping-chih). Shi Bingzhi was married to a Jurchen woman (surname Na-ho) and a Han Chinese woman (surname Chang); it is not known which of them was Shi Tianze's mother. Shi Tianze was married to two jurchen, a Han Chinese and a Korean woman, and his son Shi Gang was born to one of his jurchen wives. His Yurchen wives' surnames were Mo-nie and Na-ho, his Korean wife's surname was Li and his Han Chinese wife's surname was Shi. Shi Tianze defected to the Mongol forces when they attacked the Jin Dynasty. His son Shi Gang married Kerai women; the Kerai were Mongolised Turkic peoples and were considered part of the 'Mongol people'. Shi Tianze (Shih T'ien-tse), Zhang Rou (Chang Jou, 張柔) and Yan Shi (Yen Shih, 嚴實) and other high-ranking Chinese who served during the Jin Dynasty and defected to the Mongols helped build the new state's administrative structure. Chagaan (Tsagaan) and Zhang Rou jointly launched the invasion of the Song Dynasty ordered by Töregene Khatun.

**Question 0**

What ethnic background was Shi Tianze from?

**Question 1**

In which dynasty did Tianze live?

**Question 2**

What kind of inter-ethnic marriage became common during the Jin Dynasty?

**Question 3**

Who was Shi Tianze's father?

**Question 4**

Which dynasty did Zhang Rhou help to attack?

**Question 5**

What religion was Shi Tianze?

**Question 6**

In which dynasty did Tianze die?

**Question 7**

What kind of inter-ethnic marriage became rare during the Jin Dynasty?

**Question 8**

Who was Shi Tianze's uncle?

**Question 9**

Which dynasty did Zhang Rhou help defend?

**Text number 6**

Möngke Khan launched a military campaign against China's Song dynasty in southern China. The Mongol forces that invaded southern China were much larger than those sent by the Mongols to conquer the Middle East in 1256. He died in 1259 without a successor. Kublai returned from his battles against Song in 1260 when he learned that his brother Ariq Böke was challenging his claim to the throne. Kublai summoned a court in Kaiping, which elected him grand duke. A rival Kurultai in Mongolia proclaimed Ariq Böke as Grand Khan, which started a civil war. Kublai depended on the cooperation of his Chinese subjects to ensure that his army had ample resources. He consolidated his popularity among his subjects by modelling his administration on the bureaucracy of traditional Chinese dynasties and by adopting the Chinese-era name Zhongtong. Ariq Böke suffered from insufficient supplies and surrendered in 1264. All three western Khanates (the Golden Horde, the Chagatai Khanate and the Ilkhanate) became functionally independent, although only the Ilkhanate recognised Kublai as a truly great Khan. The civil wars had permanently divided the Mongol Empire.

**Question 0**

Who led the Mongol invasion of the Song dynasty?

**Question 1**

Where did Mongke Khan attack the Song Dynasty?

**Question 2**

When did Mongke Khan die?

**Question 3**

Who questioned Kublai Khan's right to succeed Mongke Khan?

**Question 4**

What Chinese era name did Kublai adopt?

**Question 5**

Who led the Mongol defence against the Song dynasty?

**Question 6**

Where did Mongke Khan defend the Song dynasty?

**Question 7**

When was Mongke Khan born?

**Question 8**

Who defended Kublai Khan's right to succeed Mongke Khan?

**Question 9**

Which Chinese era name was rejected by Kublai?

**Text number 7**

The early years of Kublai Khan's reign were plagued by instability. Ogedei's grandson Kaidu refused to submit to Kublai and threatened the western border of Kublai's kingdom. The hostile but weakened Song dynasty remained an obstacle in the south. Kublai secured the northeastern frontier in 1259 by installing the hostage Prince Wonjong as ruler of Korea and making it a Mongol subject state. Kublai was also threatened by internal unrest. Li Tan, the son-in-law of an influential official, fomented a rebellion against the Mongol regime in 1262. After successfully suppressing the rebellion, Kublai curbed the influence of Han Chinese advisers in his court. He feared that his dependence on Chinese officials made him vulnerable to future rebellions and defections to the Song.

**Question 0**

Who was Kaidu's grandfather?

**Question 1**

Where did the Song dynasty continue to cause problems for Kublai?

**Question 2**

Who did Kublai turn into the ruler of Korea?

**Question 3**

Where did Korea border the Kublai territory?

**Question 4**

When did Li Tan lead the rebellion?

**Question 5**

Who was Kaidu's uncle?

**Question 6**

Where did the Song dynasty continue its peaceful life with Kublai?

**Question 7**

Who did Kublai reject as the ruler of Korea?

**Question 8**

Where did China border the Kublai territory?

**Question 9**

When did Li Tan put down the rebellion?

**Text number 8**

The Kublai government after 1262 was a compromise between preserving Mongol interests in China and satisfying the demands of the Chinese subjects. He implemented the reforms proposed by his Chinese advisers by centralising the bureaucracy, expanding the use of paper money and maintaining the traditional monopolies on salt and iron. He restored the imperial secretariat and left the local government structure of the former Chinese dynasties intact. Kublai, however, abandoned plans to revive the Confucian imperial experiments and divided Yuan society into three, later four, classes, with Han Chinese at the lowest level. Kublai's Chinese advisers still had significant power in the government, but their official status was unclear.

**Question 0**

In between what did the Kublai government have to balance?

**Question 1**

Which natural resources did the Chinese government have a monopoly on?

**Question 2**

Which administrative district did Kublai leave unchanged?

**Question 3**

How many social class divisions were there in the plan rejected by Kublai?

**Question 4**

Who would have been the lowest placed category?

**Question 5**

Between what was the Kublai government out of balance?

**Question 6**

Which natural resources did the Chinese government not have a monopoly on?

**Question 7**

Which administrative division did Kublai leave unchanged?

**Question 8**

How many social class divisions were there in the plan approved by Kublai?

**Question 9**

Who would have been the highest ranked category?

**Text number 9**

Kublai prepared to move the Mongol capital from Mongolia's Karakorum to Khanbaliq in 1264 and built a new city near the former Jurchen capital of Zhongdu, now Beijing, in 1266. In 1271, Kublai formally claimed the mandate of heaven and declared 1272 to be the first year of the Great Yuan (Chinese: 大元) in the style of a traditional Chinese dynasty. The name of the dynasty was derived from the I Ching and describes the "origin of the universe" or "primordial power". Kublai proclaimed the Khanbaliq dynasty as the 'great capital' or Daidu (Dadu, Chinese 大都). The name of the era was changed to Zhiyuan to mark a new era in Chinese history. The introduction of the dynastic name legitimised the Mongol regime by integrating the government into the traditional Chinese narrative of political tradition. Khublai created a public image of himself as a wise emperor by observing the rituals of Confucian propriety and ancestor veneration, while maintaining his roots as a leader of the Aryan people.

**Question 0**

Where was the Mongol capital before Kublai moved it?

**Question 1**

Where did Kublai move the Mongolian capital?

**Question 2**

When did Kublai move the Mongol capital?

**Question 3**

Which city later became Beijing?

**Question 4**

What rituals did Kublai follow to help his image?

**Question 5**

Where had the Mongol capital been before Kublai destroyed it?

**Question 6**

Where did Kublai refuse to move the Mongolian capital?

**Question 7**

When did Kublai fail to move the Mongolian capital?

**Question 8**

Which city later became Alaska?

**Question 9**

What rituals did Kublai follow to destroy his image?

**Text number 10**

Kublai Khan promoted commercial, scientific and cultural growth. He supported Silk Road merchants by protecting the Mongol postal system, building infrastructure, providing loans to finance trade caravans and promoting the circulation of paper notes (鈔, Chao). The Pax Mongolica, the Mongol Peace Treaty, enabled the spread of technology, goods and culture between China and the West. Kublai extended the Great Canal from southern China north to Daidu. Mongol rule under Kublai Khan was cosmopolitan. He welcomed foreign visitors to his court, such as the Venetian merchant Marco Polo, who wrote the most influential European account of Yuan China. Marco Polo's travels later inspired many others, including Christopher Columbus, to go to the Far East in search of its legendary riches.

**Question 0**

What kind of growth did Kublai promote?

**Question 1**

What does "Pax Mongolica" mean?

**Question 2**

Where did the Grand Canal start?

**Question 3**

Where did Kublai extend the Grand Canal channel?

**Question 4**

Who described Kublai China to Europe?

**Question 5**

What kind of growth did Kublai prevent?

**Question 6**

What does "Pal Monqolica" mean?

**Question 7**

Where did the Grand Canal not start?

**Question 8**

Where did Kublai shorten the Grand Canal?

**Question 9**

Who filmed Kublai China in Asia?

**Text number 11**

During the Southern Song Dynasty, Duke Yansheng Kong Duanyou, a descendant of Qufu Confucius, fled south with the Song emperor to the city of Quzhou, while in the north, the newly established Jin Dynasty (1115-1234) appointed Duke Yansheng Kong Duancao, the brother of Kong Duanyou who had stayed in Qufu. From then until the Yuan Dynasty there were two Yansheng dukes, one in the north at Qufu and the other in the south at Quzhou. During the Yuan Dynasty, Emperor Kublai Khan invited the southern duke, Yansheng Kong Zhu, to return to Qufu. Kong Zhu refused and renounced the title, so the northern branch of the family retained the title of Duke of Yansheng. The southern branch remained in the city of Quzhou, where they live to this day. In Quzhou alone, there are 30,000 descendants of the Confucius. During the Yuan Dynasty, one of Confucius' descendants emigrated from China to Goryeo era Korea and established a family branch there after marrying a Korean woman.

**Question 0**

With whom did Duke Yansheng Kong Duanyou escape?

**Question 1**

When did the Jin Dynasty begin?

**Question 2**

When did the Jin Dynasty end?

**Question 3**

Who was appointed to replace Duke Yansheng Kong Duanyou?

**Question 4**

How many people in Quzhou are descended from the Confucius?

**Question 5**

Who did Duke Yansheng Kong Duanyou live with?

**Question 6**

When did the Jip dynasty begin?

**Question 7**

When did the Jip dynasty end?

**Question 8**

Who was rejected to replace Duke Yansheng Kong Duanyou?

**Text number 12**

After consolidating his rule in northern China, Kublai pursued an expansionist policy in the tradition of Mongol and Chinese imperialism. He launched a massive offensive against the Song dynasty in the south. Kublai laid siege to Xiangyang between 1268 and 1273, the last obstacle in his path to conquer the rich Yangzi River basin. In 1274 there was an unsuccessful military campaign against Japan. Kublai conquered the Song capital Hangzhou in 1276, the richest city in China. The Song loyalists fled the capital and raised a young child to the throne, the Song Emperor Bing. The Mongols defeated the loyalists at the Battle of Yamen in 1279. The last Song emperor was drowned, marking the end of the Song dynasty. The Song conquest united North and South China for the first time in three hundred years.

**Question 0**

Where did Kublai build the strength of his administration?

**Question 1**

When did Kublai attack Xiangyang?

**Question 2**

Which area did Kublai try to conquer by attacking Xiangyang?

**Question 3**

What was the capital of the Song Dynasty?

**Question 4**

How did the last Song emperor die?

**Question 5**

Where did Kublai tear down the strength of his administration?

**Question 6**

When did Kublai defend Xiangyang?

**Question 7**

Which area was Kublai trying to conquer by defending Xiangyang?

**Question 8**

Where was the capital of the Song Dynasty?

**Question 9**

How did the last Song-keiser start?

**Text number 13**

The Kublai government ran into financial difficulties after 1279. Wars and construction projects had drained the Mongolian coffers. Corruption and political scandals hampered efforts to raise tax revenue. Economic problems were compounded by poorly managed military campaigns. Kublai's second invasion of Japan in 1281 failed due to an unfavourable typhoon. Kublai failed in his campaigns against Annam, Champa and Java, but achieved a Pyrrhic victory over Burma. The expeditions were hampered by disease, an unfavourable climate and tropical terrain unsuitable for Mongol mounted warfare. The Tran (Dai Viet) dynasty, which ruled Annam, crushed and defeated the Mongols at the Battle of Bạch Đằng (1288). The Chinese territory of Fujian was the original homeland of the Chinese Tran (Chen) clan before they migrated under the leadership of Trần Kinh (陳京, Chén Jīng) to Dai Viet and whose descendants founded the Trần dynasty Đại Việt, which ruled Vietnam, and certain members of the clan could still speak Chinese, as for example when a Yuan dynasty envoy met the Chinese-speaking Trần prince Trần Quốc Tuấn (later King Trần Hưng Đạo) in 1282. Professor Liam Kelley noted that people from Song dynasty China, such as Zhao Zhong and Xu Zongdao, fled to Tran dynasty-ruled Vietnam after the Song Mongol invasion and helped Tran fight the Mongol invasion. The Tran dynasty hailed from the Fujian region of China, as did Daoist priest Xu Zongdao, who recorded the Mongol invasion and referred to them as the "bandits of the north". Annam, Burma and Champa recognised Mongol hegemony and established tributary relations with the Yuan Dynasty.

**Question 0**

When did the Kublai administration run out of money?

**Question 1**

What prevented Kublai's second invasion of Japan?

**Question 2**

Where did the Tran dynasty rule?

**Question 3**

In which battle did the Mongols defeat Tran?

**Question 4**

When were the Mongols defeated by Tran?

**Question 5**

How did the Kublai administration run out of money?

**Question 6**

What prevented Kublai's third invasion of Japan?

**Question 7**

How did the Tran dynasty rule?

**Question 8**

In which battle did the Mongols join Tran?

**Text number 14**

After the Dali Conquest in 1253, the former rulers of the Duan Dynasty were appointed governors-general, recognised as imperial officials by the Yuan, Ming and Qing governments, mainly in Yunnan province. However, the succession of the Yuan Dynasty was an intractable problem that later caused much strife and infighting. This was already evident at the end of Kublai's reign. Kublai originally appointed his eldest son Zhenjin as crown prince, but he died before Kublai in 1285. Thus, Zhenjin's third son, with the support of his mother Kökejin and Minister Bayan, ascended the throne and ruled as Temür Khan, or Emperor Chengzong, from 1294 to 1307. Temür Khan chose to maintain and continue much of the work begun by his grandfather. He also made peace with the western Mongol Khanates and neighbouring countries such as Vietnam, which recognised his nominal rule and paid taxes for a few decades. However, the corruption of the Yuan Dynasty began during the reign of Temür Khan.

**Question 0**

When did the Yuan conquer Dali?

**Question 1**

Who had Kublai wanted to succeed him?

**Question 2**

When did Zhenjin die?

**Question 3**

What was Temur Khan's Chinese-style name?

**Question 4**

When did Temur rule?

**Question 5**

When did Yuan defend Dali?

**Question 6**

Who had Kublai wanted to be his predecessor?

**Question 7**

When did Zhenjin have a son?

**Question 8**

What was Temur Khan's Japanese-style name?

**Question 9**

When did Temur die?

**Text number 15**

The fourth Yuan emperor Buyantu Khan (Ayurbarwada) was a competent emperor. He was the first Yuan emperor to actively support and adopt mainstream Chinese culture after the Kublai reign, which caused discontent among some of the Mongol elite. He had been mentored by the Confucian academic Li Meng. He introduced many reforms, including the abolition of the State Affairs Department (尚書省 in Chinese), which resulted in the execution of five of the most senior officials. From 1313, the traditional imperial examinations were reintroduced, testing future officials on their knowledge of important historical works. He also codified much of the law and published or translated many Chinese books and works.

**Question 0**

Who was the fourth ruler of the Yuan Dynasty?

**Question 1**

What did the Mongol elite wish Buyantu hadn't done?

**Question 2**

Who directed Buyantu?

**Question 3**

Which ministry was abolished by Buyantu?

**Question 4**

When did Buyantu start testing potential government employees again?

**Question 5**

Who was the third ruler of the Yuan Dynasty?

**Question 6**

What did the Mongol elite want Buyantu to do?

**Question 7**

Who refused Buyantus?

**Question 8**

Which government department did Buyantu approve?

**Question 9**

When did Buyantu stop testing potential government employees?

**Text number 16**

Emperor Gegeen Khan, Ayurbarwada's son and successor, reigned for only two years, from 1321 to 1323, continuing his father's policies by reforming the administration based on Confucian principles with the help of his newly appointed Grand Chancellor Baiju. During his reign, Da Yuan Tong Zhi (Chinese 大元通制, 'The Comprehensive Institutions of the Great Yuan'), a vast collection of Yuan Dynasty codes and regulations initiated by his father, was officially promulgated. Gegeen was assassinated in a coup involving five princes belonging to a rival faction, perhaps an aristocratic elite opposed to Confucian reforms. They placed Yesün on the throne of Temür (or Taidingd), and after unsuccessful attempts to pacify the princes, he too died by regicide.

**Question 0**

Who was Ayurbarvada's son?

**Question 1**

When did Geegen become emperor?

**Question 2**

Who did Gegeen appoint as chancellor-general?

**Question 3**

What did Da Yuan Tong Zhi mean?

**Question 4**

How many rival princes were involved in the assassination of Gegeen?

**Question 5**

Who was Ayurbarvada's daughter?

**Question 6**

When was Geegen a senator?

**Question 7**

Who did Gegeen appoint as Grand Senator?

**Question 8**

What did 'Di Yuan Shi' mean?

**Question 9**

How many rival princes were involved in living with Gegeen?

**Text number 17**

When Yesün Temür died in Shanghai in 1328, the Qipchaq commander El Temür invited Tugh Temür back to Khanbaliq. He was installed as emperor (Emperor Wenzong) of Khanbaliq, while Yesün Temür's son Ragibagh ascended the throne in Shanghai with the support of Yesün Temür's favourite servant Dawlat Shah. After receiving support from the princes and officers of northern China and some other parts of the dynasty, Tugh Temür in Khanbaliq eventually won the civil war against Ragibagh, known as the War of the Two Capitals. Tugh Temür then abdicated power in favour of his brother Kusala, who was supported by Chagatai Khan Eljigidey, and announced Khanbaliq's intention to welcome him. Kusala, however, died suddenly just four days after the banquet with Tugh Temür. El Temür allegedly killed him with poison, and Tugh Temür subsequently resumed his throne. Tugh Temür also managed to send delegates to Western Mongol Khanates, such as the Golden Horde and Ilkhanate, to gain acceptance as the suzerain of the Mongol world. However, he was mainly a puppet of the powerful official El Temür during his three-year reign. El Temür purged the pro-Kusala officials and handed power to the warlords, whose despotic rule clearly marked the dynasty's decline.

**Question 0**

Where did Yesun Temur die?

**Question 1**

What was also the name of the civil war in Ragibagh?

**Question 2**

How long after the banquet with Tugh Temur did Kusala die?

**Question 3**

Who was believed to have killed Tugh Temur?

**Question 4**

Who ascended to the throne after Kusala's death?

**Question 5**

How Yesun Temur died

**Question 6**

Why was the Ragibagh civil war never called?

**Question 7**

How long after the dinner party with Tugh Temur did Kusala have a baby?

**Question 8**

Who was believed to have loved Tugh Temur?

**Question 9**

Who ascended to the throne after the Kusala rebellion?

**Text number 18**

Whereas El Temür dominated the bureaucracy, Tugh Temür is known instead for its cultural contribution. He adopted many measures that respected Confucianism and promoted Chinese cultural values. His most concrete effort to protect Chinese scholarship was the establishment of the Academy of the Literary Star Pavilion (in Chinese 奎章閣學士院) in the spring of 1329 to carry out 'a series of tasks related to the transmission of Confucian high culture to the imperial institution of Mongolia'. The Academy was responsible for the compilation and publication of several books, but its main achievement was the compilation of a large institutional collection called Jingshi Dadian (Chinese 經世大典). Tugh Temür supported Zhu Xi's neo-confucianism and also devoted himself to Buddhism.

**Question 0**

What was Tugh Temur known for?

**Question 1**

Which academy was founded by Tugh Temur?

**Question 2**

When did Tugh Temur set up his academy?

**Question 3**

What was the most significant publication of the Tugh Academy?

**Question 4**

What religions did Tugh Temur follow?

**Question 5**

What was Tugh Temur not known for?

**Question 6**

Which academy did Tugh Temur destroy?

**Question 7**

When did Tugh Temur destroy his academy?

**Question 8**

What was the least significant publication of the Tugh Academy?

**Question 9**

What religions did Tugh Temur reject?

**Text number 19**

After the death of Tugh Temür in 1332 and the death of Rinchinbal (Emperor Ningzong) in the same year, the 13-year-old Toghun Temür (Emperor Huizong), the last of Kublai Khan's nine successors, was recalled from Guangxi and ascended the throne. After El Temür's death, Bayan became as influential an official as El Temür had been at the beginning of his long reign. As Toghun Temür grew older, he began to resent Bayan's autocratic rule. In 1340, he allied himself with Bayan's nephew Toqto'a, who was at odds with Bayan, and deposed Bayan in a coup. With Bayan's dismissal, Toghtogha took over the court. There was clearly a new, fresh spirit in his first administration. He also gave some early signs of a new and positive direction for the central government. One of his successful projects was to complete the long-stagnant official histories of the Liao, Jin and Song dynasties, which were finally completed in 1345. However, Toghtogha resigned his post with the consent of Toghun Temür, marking the end of his first reign, and was not recalled until 1349.

**Question 0**

When did Tugh Temur die?

**Question 1**

What Chinese-style name did Rinchinbal use?

**Question 2**

How old was Toghun Temur when he became emperor?

**Question 3**

How many Kublain followers was Toghun the last?

**Question 4**

Which dynasties' histories were officially documented during the Toghun reign?

**Question 5**

When was Tugh Temur born?

**Question 6**

Which Chinese-style name did Rinchinbal reject?

**Question 7**

How old was Toghun Temur when he became a senator?

**Question 8**

How many Kublai followers was Toghun the first?

**Question 9**

Which dynasties' histories were informally documented during the Toghun Empire?

**Text number 20**

The last years of the Yuan Dynasty were marked by fighting, famine and bitterness among the people. Over time, Kublai Khan's followers lost all influence in other Mongol countries across Asia, while Mongols outside the Central Kingdom considered them too Chinese. Gradually, they also lost influence in China. The later Yuan emperors had short reigns, marked by intrigues and rivalries. With no interest in governance, they were cut off from both the military and the people, and China was torn by dissension and unrest. Outlaws rampaged through the country without the weakening Yuan armies intervening.

**Question 0**

What problems did the Yuan Dynasty face near its end?

**Question 1**

Why did Kublai's followers lose control of the rest of the Mongol Empire?

**Question 2**

Who were the later Yuan Emperors isolated from?

**Question 3**

What were Yuan's armies too weak to stop?

**Question 4**

What were the later Yuan emperors not interested in?

**Question 5**

What problems did the Yuan Dynasty have near its beginning?

**Question 6**

Why did Kublai's followers take over the rest of the Mongol Empire?

**Question 7**

With whom were the later Yuan Emperors isolated?

**Question 8**

What were Yuan's armies too strong to stop?

**Question 9**

What were the later Yuan emperors interested in?

**Text number 21**

From the late 1340s onwards, the rural population suffered from recurrent natural disasters such as droughts, floods and resulting famines, and government inefficiency led to a decline in popular support. In 1351, the Red Turban Rebellion began and grew into a nationwide uprising. In 1354, when Toghtogha led a large army to crush the Red Turban rebels, Toghun Temür suddenly dismissed him for fear of betrayal. This led, on the one hand, to the restoration of Toghun Temür's power and, on the other, to the rapid weakening of the central government. He had no choice but to rely on the military power of the local warlords, and gradually lost interest in politics and stopped intervening in political struggles. In 1368, he fled from Khanbaliq (now Beijing) north to Shangdu as the forces of the Ming Dynasty (1368-1644), founded by Zhu Yuanzhang in the south, approached. He had attempted to retake Khanbaliq, but ultimately failed; he died at Yingchang (in present-day Inner Mongolia) two years later (1370). The Ming conquered Yingchang shortly after his death. Some members of the royal family still lived in Henan today.

**Question 0**

When do Yuan people suffer from multiple natural disasters?

**Question 1**

Which uprising began in 1351?

**Question 2**

Why did Toghun Temur fire Toghtogha?

**Question 3**

Who was Toghtogha trying to defeat?

**Question 4**

When was the Ming Dynasty in power?

**Question 5**

When do Yuan people suffer from multiple unnatural disasters?

**Question 6**

Which uprising ended in 1351?

**Question 7**

Why did Toghun Temur accept Toghtogha?

**Question 8**

Who was Toghtogha trying to defend?

**Question 9**

When did the Ming dynasty's rule end?

**Text number 22**

The Yuan Dynasty saw the development of a rich cultural diversity. Among the greatest cultural achievements were the development of drama and the novel, and the increasing use of the written vernacular. Political unity between China and much of Central Asia encouraged trade between East and West. Mongolia's extensive contacts with West Asia and Europe produced a considerable amount of cultural exchange. Other cultures and peoples of the Mongol world empire also greatly influenced China. It had greatly facilitated trade and commerce throughout Asia until its demise; contacts between the Yuan dynasty and its ally and subject, the Ilkhanate in Persia, contributed to this development. Buddhism was a major influence in the Yuan government, and the Tibetan rite, Tantric Buddhism, had a significant impact on China during this period. The Muslims of the Yuan Dynasty introduced Middle Eastern cartography, astronomy, medicine, clothing and diet to East Asia. Oriental crops such as carrots, turnips, new varieties of lemon, aubergine and melon, high quality granulated sugar and cotton were either introduced or successfully introduced during the Yuan Dynasty.

**Question 0**

What promoted trade during the yuan?

**Question 1**

What promoted cultural exchange during the Yuan?

**Question 2**

Who was Yuan's Persian ally?

**Question 3**

What crops were introduced or popularised during the Yuan?

**Question 4**

What discouraged trade during the yuan?

**Question 5**

What prevented cultural exchange during the Yuan?

**Question 6**

What was Yuan's Persian enemy?

**Text number 23**

Western instruments were introduced to enrich Chinese performing arts. It was during this period that Muslims in Central Asia converted more and more Chinese in the north-west and south-west to Islam. Nestorianism and Roman Catholicism also enjoyed a period of tolerance. Buddhism (especially Tibetan Buddhism) flourished, although Taoism suffered from certain persecutions by the Yuan regime in favour of Buddhism. Confucian administrative practices and classical experiments, which had fallen out of favour in northern China during the period of the Dissent, were reintroduced in the Yuan court, probably in the hope of preserving the order of Han society. Progress was made in the fields of travel writing, cartography, geography and scientific education.

**Question 0**

What kind of instruments did the Yuan bring to China?

**Question 1**

Apart from Confucianism, Buddhism and Islam, what other religions were tolerated during the Yuan period?

**Question 2**

Which religion did the Yuan reject to support Buddhism?

**Question 3**

What practices did Yuan reintroduce in government?

**Question 4**

What areas of research were promoted during the Yuan?

**Question 5**

What kind of instruments did the Yuan keep out of China?

**Question 6**

Apart from Confucianism, Buddhism and Islam, what religions were not tolerated during the Yuan period?

**Question 7**

What religion did the Yuan encourage to support Buddhism?

**Question 8**

What kind of practices did Yuan introduce in the government?

**Question 9**

What fields of study were not promoted under Yuan?

**Text number 24**

The first recorded European journeys to and from China date from this period. The most famous traveller of the period was the Venetian Marco Polo, whose account of his journey to 'Cambaluci', the capital of the Great Khan, and life there astonished Europeans. His travelogue Il milione (or The Million, in English Marco Polo's Travels) appeared around 1299. Some dispute the accuracy of Marco Polo's accounts, as they do not mention the Great Wall of China, the tea houses, which would have been a major attraction as Europeans had not yet adopted tea culture, or the practice of foot-binding by women in the capital of the Great Khan. Some speculate that Marco Polo acquired much of his knowledge through contact with Persian merchants, as many of the places he named were in Persian.

**Question 0**

Who was the first known European to visit and return from China?

**Question 1**

What did Polo call the capital of Yuan?

**Question 2**

What was the English title of Polo's book?

**Question 3**

What was the Italian title of Polo's book?

**Question 4**

How did some people suspect that Polo learned about China instead of visiting it?

**Question 5**

Who was the last known European to visit and return from China?

**Question 6**

What did Polo call Yuan's half-capital?

**Question 7**

What was the Spanish title of Polo's book?

**Question 8**

What was the Irish title of Polo's book?

**Text number 25**

Yuan carried out extensive public works. Among Kublai Khan's top engineers and scientists was the astronomer Guo Shoujing, who was commissioned to carry out many public works projects and helped Yuan to revise the lunar calendar so that the year was accurate to 365.2425 days, just 26 seconds from the modern Gregorian calendar. Road and water connections were reorganised and improved. In the event of famine, grain stores were ordered to be built throughout the kingdom. The city of Beijing was rebuilt with new palatial areas, including artificial lakes, hills and mountains, and parks. During the Yuan period, Beijing became the terminus of the Great Canal of China, which was completely renovated. These commercially oriented improvements promoted land and sea trade throughout Asia and facilitated China's direct links with Europe. Chinese travellers to the West were able to offer assistance in areas such as hydraulic engineering. Contacts with the West also brought China an important food crop, sorghum, and other foreign foodstuffs and manufacturing techniques.

**Question 0**

Which astronomer worked for Kublai?

**Question 1**

How accurate did Guo make the revised lunar calendar?

**Question 2**

What did Kublai do to prevent famine?

**Question 3**

To which city did the Grand Canal extend during the Yuan?

**Question 4**

Which major crop was imported into China from the West?

**Question 5**

Which astronomer hated Kublai?

**Question 6**

How accurate did Guo make the constructed lunar calendar?

**Question 7**

What did Kublai do to alleviate the famine?

**Question 8**

Which city could not be reached by the Grand Canal during the Yuan?

**Question 9**

Which major crop was imported to Japan from the West?

**Text number 26**

The Yuan Dynasty was the first time that non-Indigenous Chinese ruled the whole of China. In Mongolian historiography, it is generally regarded as the successor to the Mongol Empire. The Mongols are generally known to worship the Eternal Heaven, and according to traditional Mongolian ideology, Yuan is considered to be 'the beginning of an infinite number of beings, the foundation of peace and happiness, the sovereignty of the state, the dream of many peoples, beyond which there is nothing great or precious'. In traditional Chinese historiography, on the other hand, the Yuan dynasty is generally regarded as a legitimate dynasty between the Song and Ming dynasties. Note, however, that the Yuan dynasty is traditionally often extended to include the Mongol Empire before Kublai Khan formally established the Yuan in 1271, partly because Kublai placed his grandfather in the official records of Genghis Khan as the founder of the dynasty, Taizu (太祖 in Chinese). Despite the traditional historiography as well as official views (including the Ming dynasty government that overthrew the Yuan dynasty), there are also Chinese people[who?] who did not consider the Yuan dynasty as a legitimate dynasty in China, but rather as a foreign power. The latter believe that Han Chinese were treated as second-class citizens and that China stagnated economically and scientifically.

**Question 0**

Who ruled all of China for the first time during the Yuan?

**Question 1**

What did the Mongols worship?

**Question 2**

What was the legal dynasty before the Yuan dynasty?

**Question 3**

Which legal dynasty came after the Yuan?

**Question 4**

Some Chinese considered the Yuan dynasty to be a legitimate dynasty, but what did other Chinese think of it?

**Question 5**

Who ruled the whole of Japan for the first time during the Yuan?

**Question 6**

What did the Mongols refuse to worship?

**Question 7**

Which illegal dynasty preceded Yuan?

**Question 8**

Which illegal dynasty came after Yuan?

**Text number 27**

The bureaucratic system created by Kublai Khan reflected the different cultures of the empire, including Han Chinese, Khitan, Yurchen, Mongolian and Tibetan Buddhist. Although the official terminology of the institutions might suggest that the administrative structure was almost purely that of the native Chinese dynasties, the Yuan bureaucracy was in fact a mixture of elements from different cultures. The Chinese-style elements of the bureaucracy came mainly from the indigenous Tang and Song dynasties and the Khitan Liao and Jurchen Jin dynasties. Chinese advisers such as Liu Bingzhong and Yao Shu gave strong influence to the early Kublai court, and a central administration was established in the first decade of Kublai rule. The government adopted the traditional Chinese tripartite division of power between civil, military and censorship authorities, with a central secretariat (Zhongshu Sheng) to handle civil affairs, a secret society (Chinese: 樞密院) to handle military affairs and a censorship bureau to carry out internal control and inspection. However, there was considerable overlap in the actual functions of both central and local government institutions between civil and military jurisdiction, due to the Mongols' traditional reliance on military institutions and agencies as the core of governance. However, a civil bureaucracy was created in China, with the central secretariat as the supreme institution, responsible (directly or indirectly) for most other government agencies (such as the traditional Chinese system of six ministries). Occasionally, a second central government department called the Department of State Affairs (Shangshu Sheng) was created, which dealt mainly with finance (for example, under Külüg Khan or Emperor Wuzong), but this was generally abandoned soon afterwards.

**Question 0**

Which cultures were part of the Kublai administration?

**Question 1**

Which dynasties inspired the Chinese elements of the Kublai government?

**Question 2**

Who were the two Chinese advisers to Kublai?

**Question 3**

What was the division of power in the Kublai government?

**Question 4**

What were the three parts of the Kublai government?

**Question 5**

Which cultures were not part of the Kublai regime?

**Question 6**

Which dynasties inspired the Japanese-inspired elements of the Kublai government?

**Question 7**

Who was Kublai's third Chinese adviser?

**Question 8**

What kind of separation of powers did the Kublai government never have?

**Text number 28**

While the existence of these central government departments and six ministries (introduced from the Sui and Tang dynasties onwards) gave the Yuan administration a blue-print, the actual functions of these ministries also reflected how Mongol priorities and policies reshaped and redirected these institutions. For example, the jurisdiction of the Yuan's judiciary, the Ministry of Justice, did not extend to cases involving Mongols and Semuren, who had separate courts. Cases involving members of more than one ethnic group were decided by a mixed panel of Chinese and Mongols. Another example was the insignificance of the War Ministry compared to the original Chinese dynasties, as the real military power under the Yuan was vested in the Privy Council.

**Question 0**

Who had military control during the Yuan?

**Question 1**

When had the six ministries existed?

**Question 2**

Who was released from the Ministry of Justice?

**Question 3**

Who had no real military power during the Yuan?

**Question 4**

Who had military control during the Yuan?

**Question 5**

When had the eight ministries existed?

**Question 6**

Who was not released by the Ministry of Justice?

**Question 7**

Who had no real military power after Yuan?

**Text number 29**

The Phags-pa script, invented in 1269 as a unified script for Mongolian, Tibetan and Chinese, remained at court until the end of the dynasty. Most emperors did not know written Chinese, but they could usually converse well in Chinese. The Mongols had a long-standing habit of forming quda/avio marriages with the Mongol clans, the Onggirat and Ikeres, which is why the imperial blood remained pure Mongol until the reign of Tugh Temur, whose mother was a Tangut concubine. The Mongol emperors had built great palaces and pavilions, but some of them still continued to live nomadic lives from time to time. A few other Yuan emperors, however, actively supported cultural activities, such as Tugh Temur (Emperor Wenzong), who wrote poetry, painted, read classical Chinese texts and ordered the compilation of books.

**Question 0**

When was the Phags-pa spelling invented?

**Question 1**

Which languages used the Phags-pa script?

**Question 2**

How well did the Mongol emperors know Chinese?

**Question 3**

Which emperor's mother was a concubine?

**Question 4**

What was Tugh's Chinese-style name?

**Question 5**

When was the Phags-pa script destroyed?

**Question 6**

Which languages rejected Phags-pa?

**Question 7**

How badly did the Mongol emperors speak spoken Chinese?

**Question 8**

Which emperor's father was a concubine?

**Question 9**

What was Tugh's Japanese-style name?

**Text number 30**

During the Yuan Dynasty, the Mongol garrison family seemed to have lived a degenerate leisure life in the countryside, and the income from their Chinese tenants' crops had been spent equipping and sending the men into service. The Mongols practised debt slavery, and by 1290 ordinary people throughout the Mongol Empire were selling their children into slavery. Kublai considered this harmful to the Mongol people and in 1291 banned the sale of Mongols abroad. Kublai wanted to convince the Chinese that he was becoming increasingly blue, while maintaining the Mongols' credibility among his own people. He established a civil administration to rule, built a capital inside China, supported Chinese religions and culture, and designed economic and political institutions suitable for the court. At the same time, however, he never abandoned his Mongol heritage.

**Question 0**

By what year was the sale of children as slaves common among the Mongols?

**Question 1**

When did Kublai ban the international Mongol slave trade?

**Question 2**

How did Mongolian garrison families earn money?

**Question 3**

By what year was the sale of children into slavery rare among the Mongols?

**Question 4**

When did Kublai not ban the international Mongol slave trade?

**Question 5**

How did Mongolian garrison families not make money?

**Text number 31**

During the Yuan or Mongol period in China, many important artistic disciplines such as painting, mathematics, calligraphy, poetry and theatre took place or continued, and many great artists and writers are famous today. Since painting, poetry and calligraphy were combined during this period, many of the artists who practised these different disciplines were the same person, although they may have been better known in some areas than others. The Song Dynasty and the Yuan Dynasty are often linked in terms of the further development of landscape painting and the classical fusion of painting, poetry and calligraphy. There were many famous painters in Chinese painting during the Yuan Dynasty. In calligraphy, many of the great calligraphers were from the Yuan Dynasty. The most important development in Yuan poetry was the Qu, which most famous Yuan poets used alongside other forms of poetry. Many of the poets were also involved in the great development of theatre during this period, and vice versa: important figures in theatre became famous through the development of the sanqu-type qu. One of the most important factors in the mixing of zaju varietee was the inclusion of poetry from both the classical and more recent qu forms. One of the important cultural developments of the Yuan period was the fusion of poetry, painting and calligraphy into a single work, the kind that usually comes to mind when one thinks of classical Chinese art. Another important aspect of the Yuan period is the increasing incorporation of the vernacular Chinese language of the time into both the qu form of poetry and zaju verse. Another important aspect of Yuan Dynasty art and culture is that much of it has been preserved in China, compared to the works of the Tang and Song Dynasties, which are often better preserved in, for example, Japanese Shōsōin.

**Question 0**

What kind of art flourished under Yuan?

**Question 1**

What arts were often practised together by the same artists?

**Question 2**

Which dynasty shared artistic inspiration with Yuan?

**Question 3**

Which form of poetry was developed during the Yuan period?

**Question 4**

What was a popular variety show during the Yuan period?

**Question 5**

Which languages flourished under the Yuan?

**Question 6**

What sciences were often practised together by the same artists?

**Question 7**

Which dynasty did not share artistic inspiration with Yuan?

**Question 8**

What form of songwriting was developed in Yuan?

**Text number 32**

During the Yuan Dynasty, many religions were practised, including Buddhism, Islam and Christianity. The establishment of the Yuan Dynasty had dramatically increased the number of Muslims in China. However, unlike the Western Khanates, the Yuan Dynasty never converted to Islam. Instead, Kublai Khan, the founder of the Yuan Dynasty, favoured Buddhism, especially the Tibetan variants. As a result, Tibetan Buddhism became established as the de facto state religion. A top-level department and government agency called the Buddhist and Tibetan Affairs Bureau (Xuanzheng Yuan) was established in Khanbaliq (now Beijing) to oversee Buddhist monks throughout the empire. As Kublai Khan only valued the Sakya Lakh of Tibetan Buddhism, other religions were given less importance. He and his successors kept the Sakya imperial preceptor (Dishi) at court. Before the end of the Yuan Dynasty, 14 Sakya leaders had held the post of Imperial Preceptor and thus enjoyed special power. In addition, the protection of Mongolian Buddhism led to the creation of several monuments of Buddhist art. Mongolian Buddhist translations, almost all from Tibetan originals, began on a large scale after 1300. Many members of the Mongol upper classes, such as the Jalayir and Oronar nobles and emperors, also patronised Confucian scholars and institutions. A considerable number of Confucian and Chinese historical works were translated into Mongolian.

**Question 0**

Which Canaanite communities had converted to Islam?

**Question 1**

What religion did Kublai favour?

**Question 2**

What was the unofficial state religion of the Yuan?

**Question 3**

Which government agency supervised the Buddhist monks?

**Question 4**

What was Kublai's favourite sect of Tibetan Buddhism?

**Question 5**

Which Canaanites had not converted to Islam?

**Question 6**

Which religion did Kublai reject?

**Question 7**

What was the official state religion of Yuan?

**Question 8**

Which was Kublai's least favourite sect of Tibetan Buddhism?

**Text number 33**

Mathematicians developed polynomial algebra in the Yuan era. The mathematician Zhu Shijie (1249-1314) solved simultaneous equations with up to four unknowns using a rectangular set of coefficients corresponding to modern matrices. Zhu used the elimination method to reduce simultaneous equations to a single equation with only one unknown. His method is described in Jade Mirror of the Four Unknowns, written in 1303. In the opening pages is a diagram of Pascal's triangle. The book also discusses the summation of a finite arithmetic series.

**Question 0**

When was Zhu Shijie born?

**Question 1**

When did Zhu Shijie die?

**Question 2**

With which modern mathematical concept did Zhu Shijie do similar work?

**Question 3**

What kind of mathematics was developed under Yuan?

**Question 4**

When did Zhu publish "The Four Unknown Jade Mirrors"?

**Question 5**

When was Zhu Shijie the ruler?

**Question 6**

When did Zhu Shijie get a new job?

**Question 7**

Which modern mathematical concept did Zhu Shijie do a different job than what he did?

**Question 8**

What kind of mathematics did not develop under Yuan?

**Question 9**

When did Zhu publish "The Five Unknown Jade Mirrors"?

**Text number 34**

Guo Shoujing applied mathematics to the construction of calendars. He was one of the first mathematicians in China to work on spherical trigonometry. Gou derived a cubic interpolation formula for astronomical calculations. His calendar, Shoushi Li (授時暦), or the Calendar of Seasons, was disseminated in 1281 as the official calendar of the Yuan Dynasty. The calendar may have been influenced solely by the work of the Song dynasty astronomer Shen Kuo or possibly by the work of Arab astronomers. There are no clear signs of Muslim influence on the Shoush calendar, but the Mongol rulers are known to have been interested in Muslim calendars. Under the Mongols, mathematical knowledge from the Middle East was imported into China, and Muslim astronomers introduced Arabic numerals to China in the 13th century.

**Question 0**

What did Guo Shoujing do to the calendars?

**Question 1**

What did Gou use for astronomy?

**Question 2**

What was the Chinese name for the Gou calendar?

**Question 3**

What was the English name of the Gou calendar?

**Question 4**

When did the Gou calendar become the official calendar of Yuan?

**Question 5**

What did Guo Shoujing not do to the calendars?

**Question 6**

What did Gou spend on science?

**Question 7**

What was the Chinese name for Gou's mathematics?

**Question 8**

What was the English name for Gou's mathematics?

**Question 9**

When was the Gou calendar rejected as the official calendar of the Yuan?

**Text number 35**

The doctors at the Yuan court came from different cultures. The healers were divided into non-Mongolian doctors, called otachi, and traditional Mongolian shamans. Mongolians characterised Otachi physicians as using herbal medicines, which differed from the spiritual cures of Mongolian shamanism. The doctors received official support from the Yuan government and were given special legal privileges. Kublai established the Imperial Academy of Medicine to administer medical treatises and train new doctors. Confucian scholars were attracted to the medical profession because it guaranteed a good income and medical ethics were compatible with Confucian virtues.

**Question 0**

Who were the Otachi?

**Question 1**

What kind of medicine did Otachi focus on?

**Question 2**

What kind of medicine did the Mongol shamans use?

**Question 3**

Which department did Kublai set up to train doctors?

**Question 4**

Why did the Confucians like medicine?

**Question 5**

Who were the Potachs?

**Question 6**

What kind of medicine did Otachi reject?

**Question 7**

What kind of medicine did non-Mongolian shamans use?

**Question 8**

Which department did Kublai set up to harass doctors?

**Question 9**

Why did the Confucians hate medicine?

**Text number 36**

In Yuan's time, there were "four great schools" of Chinese medicine, inherited from the Jin dynasty. All four schools were based on the same intellectual foundation, but advocated different theoretical approaches to medicine. During the Mongol period, the practice of Chinese medicine spread to other parts of the empire. The Mongols took Chinese doctors with them on military expeditions as they expanded westwards. Chinese medical techniques, such as acupuncture, moxibustion, pulse diagnosis and various herbal medicines and elixirs, spread westwards to the Middle East and other parts of the empire. The Yuan period saw many medical advances. The physician Wei Yilin (1277-1347) invented a method of suspension to reduce dislocated joints, which he performed using an anaesthetic. The Mongol physician Hu Sihui described the importance of a healthy diet in a medical treatise published in 1330.

**Question 0**

How many medical schools were recognised in China?

**Question 1**

How did Yuan have four schools of medicine?

**Question 2**

How did Chinese medicine spread?

**Question 3**

What techniques did Chinese medicine involve?

**Question 4**

When did Wei Yilin die?

**Question 5**

How many medical schools were recognised in Japan?

**Question 6**

How did Yuan have eight schools of medicine?

**Question 7**

How did Chinese medicine stay in one place?

**Question 8**

What techniques did Chinese medicine never include?

**Text number 37**

Western medicine was also practised in China by Nestorian Christians of the Yuan court, and was sometimes called huihui or Muslim medicine. The Nestorian physician Jesus the Interpreter founded the practice of Western medicine in 1263 during the reign of Kublai. Huihui doctors, who worked in two imperial hospitals, were responsible for the care of the imperial family and members of the court. Chinese doctors opposed Western medicine because its humoral system was at odds with the yin-yang and wuxing philosophy that underpinned traditional Chinese medicine. Chinese translations of Western medical works are not known, but it is possible that the Chinese had access to the Avicenna Canon of Medicine.

**Question 0**

What was the huihui?

**Question 1**

Who founded Western medicine?

**Question 2**

When was the Western Medical Bureau established?

**Question 3**

What aspects of Western medicine did the Chinese dislike?

**Question 4**

What are the philosophies behind Chinese medicine?

**Question 5**

What was hoho?

**Question 6**

Who founded the Office of Oriental Medicine?

**Question 7**

When was the Eastern Medical Office established?

**Question 8**

What features of Western medicine did the Chinese like?

**Question 9**

What are the philosophies of Chinese medicine?

**Text number 38**

The Mongol rulers supported the Yuan printing industry. Chinese printing technology was transferred to the Mongols through intermediaries in the Kingdom of Qocho and Tibet. Some Yuan documents, such as Wang Zhen's Nong Shu, were printed using a loose type technique invented in the 13th century. However, most of the published works were still produced using traditional printing techniques. The publication of a Taoist text bearing the name of Töregene Khatun, the wife of Ögedei, is one of the first printed works supported by the Mongols. In 1273, the Mongols established the Imperial Library Department, a government-supported printing press. The Yuan government established printing centres throughout China. Local schools and government offices were funded to support book publishing.

**Question 0**

How did the Mongols acquire Chinese printing technology?

**Question 1**

Who wrote Nong Shun?

**Question 2**

When was the clay brick movable type invented?

**Question 3**

Who was Ogedei's wife?

**Question 4**

When was the Imperial Library Department established?

**Question 5**

How did the Mongols acquire Japanese printing technology?

**Question 6**

Who abandoned Nong Shu?

**Question 7**

When were the earthenware loose-leaf binders destroyed?

**Question 8**

Who was Ogedei's husband?

**Question 9**

When was the Imperial Library Department not established?

**Text number 39**

One of the most important applications of printing technology was the chao, the paper money of the yuan. Chaos were made from the bark of mulberry trees. The Yuan government used wooden printing plates to print paper money, but switched to bronze plates in 1275. The Mongols experimented with the introduction of a Chinese-style paper money system in Mongol-controlled areas outside China. Yuan's minister Bolad was sent to Iran, where he explained Yuan's paper money to the court of Gaykhatu Il-khan. The Il Khanate government issued paper money in 1294, but public distrust of the new exotic currency destroyed the experiment.

**Question 0**

What was the name of the Yuan paper money?

**Question 1**

What was chao made of?

**Question 2**

When did the Yuan start using bronze printing plates to print money?

**Question 3**

What had Yuan used to print money before the bronze plates?

**Question 4**

When did Il-khanate experiment with paper money?

**Question 5**

What was the name of Yuan's plastic money?

**Question 6**

What was the show made of?

**Question 7**

When did the Yuan start using gold printing plates as their currency?

**Question 8**

What was Yuan printing money on before plastic plates?

**Question 9**

When did the Il-Canate stop experimenting with paper money?

**Text number 40**

Politically, the system of government created by Kublai Khan was a compromise between Mongol patrimonial feudalism and the traditional Chinese autocratic and bureaucratic system. However, the socially educated Chinese elite did not generally enjoy the prestige previously accorded to it under the original Chinese dynasties. Although the traditional Chinese elite did not share in power, the Mongols and Semurans (various allied groups from Central Asia and the western end of the empire) remained largely alien to mainstream Chinese culture, and this dichotomy gave the Yuan regime a somewhat strong 'colonial' colour. The unequal treatment was possibly due to a fear of transferring power to ethnic Chinese. Mongols and Semuren were given certain advantages during the dynasty, and this continued even after the restoration of imperial degrees in the early 1300s. In general, North or South Chinese very rarely reached the highest positions in government, compared to the Persians who did so during the Ilkhanate. Later, the Yongle Emperor of the Ming Dynasty also mentioned the discrimination that existed during the Yuan Dynasty. In response to a protest about the use of 'barbarians' in his government, the Yongle Emperor replied: "... the Mongols used discrimination during the Yuan Dynasty when they used only "Mongols and Tartars" and rejected the North and South Chinese, and this was the very reason that caused their disaster".

**Question 0**

Which Mongol system did the Kublai government compromise with?

**Question 1**

Which Chinese system did the Kublai government compromise with?

**Question 2**

Who were the Semuren?

**Question 3**

How did the unequal treatment of the Chinese and Mongols under the Yuan make the dynasty look?

**Question 4**

Where did the Persians do better than the Chinese during the Yuan?

**Question 5**

With which Mongol system was the Kublai government intransigent?

**Question 6**

Which Chinese system did the Kublai government not compromise with?

**Question 7**

Who were the Samurones?

**Question 8**

What did the equal treatment of Chinese and Mongols under the Yuan look like during the dynasty?

**Text number 41**

At the same time that the Mongols brought Central Asian Muslims to China as administrators, the Mongols also sent Han Chinese and Khitans from China to administer the Muslim population of Bukhara in Central Asia and used foreigners to limit the power of the local peoples of both countries. The Mongols moved Han Chinese to areas of Central Asia such as Besh Baliq, Almaliq and Samarqand, where they worked as artisans and farmers. The Alans were recruited into the Mongol forces by one unit called the 'Right Guard of Alani', which was combined with 'newly surrendered' soldiers, Mongols and Chinese soldiers stationed in the former Qocho Kingdom, and in Besh Baliqhi the Mongols established a Chinese military colony under the leadership of the Chinese general Qi Kongzhi (Ch'i Kung-chih). After the Genghis Khan's Mongols conquered Central Asia, foreigners were elected as administrators, and joint administration of the gardens and fields of Samarqand with the Chinese and Qara Khitans (Khitans) was imposed on the Muslims because the Muslims could not rule without them. The governor of Samarqand appointed by the Mongols was a Kara-Khitai (Khitan) with the title of Taishi, who was familiar with Chinese culture and whose name was Ahai.

**Question 0**

Who did the Mongols bring to China as administrators?

**Question 1**

Who did the Mongols send to Buhara as administrators?

**Question 2**

Where in Central Asia did Han Chinese migrate to?

**Question 3**

What kind of work did the Hanoi do in Central Asia?

**Question 4**

Who was appointed Governor of Samarqand?

**Question 5**

Who did the Mongols bring to Japan as administrators?

**Question 6**

Who did the Mongols not send to Buhara as administrators?

**Question 7**

Where in Central Asia did Han Chinese not migrate?

**Question 8**

What kind of work did the Hanoi do in East Asia?

**Text number 42**

Despite the high status of Muslims, some Yuan emperor policies severely discriminated against them by restricting halal and other Islamic practices, such as circumcision, as well as kosher food for Jews and forcing them to eat Mongolian-style food. Towards the end, the corruption and persecution became so severe that Muslim generals joined the Han Chinese in a revolt against the Mongols. The Ming emperor Zhu Yuanzhang had Muslim generals like Lan Yu who rebelled against the Mongols and defeated them in battle. Some Muslim communities had Chinese surnames meaning 'barracks' and could also mean 'thanks'. Many Hui Muslims claim that this is because they played an important role in defeating the Mongols and that the Han Chinese gave it as a thank you for helping them. During the war against the Mongols, the army of Ming Emperor Zhu Yuanzhang included a Hui Muslim, Feng Sheng. The Shemu Muslims also rebelled against the Yuan Dynasty in the Ispah Rebellion, but the rebellion was crushed and the Muslims were slaughtered by Chen Youding, a loyal Yuan commander.

**Question 0**

Which of Yuan's policies did Muslims dislike?

**Question 1**

What Jewish practice did Yuan forbid?

**Question 2**

Who founded the Ming Dynasty?

**Question 3**

What was the second meaning of the Chinese word "barracks"?

**Question 4**

Who rebelled in the Ispa rebellion?

**Question 5**

What did the Muslims like about Yuan's policies?

**Question 6**

What Jewish practice did Yuan follow?

**Question 7**

Who founded the Ding Dynasty?

**Question 8**

What was the second meaning of the Japanese word "barracks"?

**Question 9**

Who was obedient in the Ispa revolt?

**Text number 43**

Historian Frederick W. Mote wrote that the use of the term "social classes" in this system was misleading and that people's position in the four-class system was not an indication of their actual social power and wealth, but merely signified "degrees of privilege", to which they were institutionally and legally entitled, so that a person's position within the classes was no guarantee of his or her status, as there were rich and socially well-off Chinese, while there were fewer less wealthy Mongols and Semus than there were poor and mistreated Mongols and Semus.

**Question 0**

Who thought that Yuan's social class system should not be called social classes?

**Question 1**

What did Mote think the Yuan class system really represented?

**Question 2**

There were many Chinese who had what unexpected position?

**Question 3**

Many Mongols had what unexpected position?

**Question 4**

Who came up with the idea that the Yuan social class system should be called social classes?

**Question 5**

What did Mote think the Yuan class system did not represent?

**Question 6**

There were a lot of Chinese there, who had what expected position?

**Question 7**

Many Mongols had what was the expected position?

**Text number 44**

The reason for the class system and why people were placed in a particular class was because of when they surrendered to the Mongols, and it had nothing to do with their ethnic origin. The earlier they surrendered to the Mongols, the higher they were placed, and the longer they survived, the lower they were placed. The North Chinese ranked higher and the South Chinese ranked lower because South China held out and fought to the last before giving up. The great trade of this era created favourable conditions for South Chinese private manufacturers and traders.

**Question 0**

In which parts of China did people rank higher in the class system?

**Question 1**

In which parts of China did people move down the class system?

**Question 2**

Why did the South Chinese rank lower?

**Question 3**

Why did the North Chinese rank higher?

**Question 4**

Who was helped by the increased trading of the yuan?

**Question 5**

In which part of Japan were people higher up in the class system?

**Question 6**

In which parts of Japan did people move down the class system?

**Question 7**

Why did the East Chinese rank lower?

**Question 8**

Why did the West Chinese finish higher?

**Question 9**

Who was helped by the decline of the yuan in trade?

**Text number 45**

When the Mongols put the Uyghurs of the Qocho kingdom above the Koreans at court, the Korean king objected, after which the Mongol emperor Kublai Khan rebuked the Korean king, saying that the Uyghur king of Qocho was superior to the Kara-Kanid ruler of Karluk, who in turn was superior to the Korean king, who was in last place because the Uyghurs surrendered to the Mongols first, the Karluks surrendered after the Uyghurs and the Koreans surrendered last, and because the Uyghurs surrendered peacefully without violent resistance.

**Question 0**

To whom did the Mongols give control of Korea?

**Question 1**

Who was the Uighur king of Qocho, above whom he was?

**Question 2**

Who was the ruler of the Karluk Kara rabbits, who was above?

**Question 3**

Why did the Mongols outrank the Uyghurs?

**Question 4**

From whom did the Mongols refuse to rule Korea?

**Question 5**

Who was the Uighur king of Qocho, ranked below?

**Question 6**

Who was the ruler of the Karluk Kara-Kanids who ranked lower?

**Question 7**

Why did the Mongols put the Uyghurs in a lower position?

**Text number 46**

The central region, which included present-day Hebei, Shandong, Shanxi, the south-eastern part of present-day Inner Mongolia and the Henan regions north of the Yellow River, was considered the most important area of the dynasty and was directly ruled by the central secretariat (or Zhongshu Sheng) in Khanbaliq (present-day Beijing); The second top-level administrative department, the Bureau of Buddhist and Tibetan Affairs (Xuanzheng Yuan), controlled the whole of what is now Tibet, as well as parts of Sichuan, Qinghai and Kashmir.

**Question 0**

Which region of China does Hebei belong to?

**Question 1**

Who ruled Central Europe during the Yuan period?

**Question 2**

Where was the central secretariat located?

**Question 3**

What modern city did Khanbaliq become?

**Question 4**

What was the Chinese name for the Central Secretariat?

**Question 5**

Which region of Japan does Hebei belong to?

**Question 6**

Who ruled the north during the Yuan period?

**Question 7**

Where was the non-secretariat headquarters of the central unit?

**Question 8**

What modern city did Khanbaliq not become?

**Question 9**

What was the Japanese name of the central office?

**Document number 467**

**Text number 0**

The immune system is a system of many biological structures and processes in the body that protects the body against disease. To function properly, the immune system must detect a wide range of agents called pathogens, from viruses to parasitic worms, and distinguish them from the body's own healthy tissue. In many species, the immune system can be classified into subsystems, such as innate immunity and adaptive immunity, or humoral immunity and cell-mediated immunity. In humans, the blood-brain barrier, blood-spinal fluid barrier and similar fluid-brain barriers separate the peripheral immune system from the neuroimmune system that protects the brain.

**Question 0**

What does the immune system protect organisms against?

**Question 1**

What substances does the immune system detect?

**Question 2**

Which part of the immune system protects the brain?

**Question 3**

What is the difference between the neuroimmune system and the peripheral immune system in humans?

**Question 4**

What are the substances detected by the immune system called?

**Question 5**

What are the two different types of immunity?

**Question 6**

What are the two main subsystems of the immune system?

**Question 7**

What is the immune system of the brain known as?

**Question 8**

What is the system of many biological structures and processes that protect an organism from the cold?

**Question 9**

What is not an example of a pathogen?

**Question 10**

What can't the immune system distinguish from healthy tissue?

**Question 11**

What is the immune system of the stomach?

**Question 12**

What links the peripheral immune system to the neuroimmune system?

**Text number 1**

Immune system disorders can lead to autoimmune diseases, inflammatory diseases and cancer. Immune deficiency occurs when the immune system is less active than normal, leading to recurrent and life-threatening infections. In humans, immunodeficiency can be caused either by a genetic condition such as severe mixed immunodeficiency, acquired diseases such as HIV/AIDS, or the use of immunosuppressive medication. Autoimmunity, on the other hand, is caused by an overactive immune system attacking normal tissues as if they were foreign organisms. Common autoimmune diseases include Hashimoto's thyroiditis, rheumatoid arthritis, diabetes mellitus type 1 and systemic lupus erythematosus. Immunology covers the study of all aspects of the immune system.

**Question 0**

What happens when the immune system is less active than normal?

**Question 1**

What is the term for a hyperactive immune system that attacks normal tissues?

**Question 2**

In which field is the immune system studied?

**Question 3**

What acquired condition leads to immunodeficiency in humans?

**Question 4**

What immune disorders do not cause?

**Question 5**

What kind of medicine can cause autoimmunity?

**Question 6**

What causes the immune system to treat foreign organisms like normal tissues?

**Question 7**

What is not an immunodeficiency disease?

**Question 8**

What is a rare autoimmune disease?

**Text number 2**

Immunology is the science that studies the structure and function of the immune system. It has its origins in medicine and early research into the causes of immunity to disease. The earliest known mention of immunity was during the Plague of Athens in 430 BC. Thucydides found that people who had recovered from a previous bout of disease were able to treat the sick without contracting the disease a second time. In the 1700s, Pierre-Louis Moreau de Maupertuis experimented with scorpion venom and found that certain dogs and mice were immune to this venom. This and other observations of acquired immunity were later used by Louis Pasteur to develop vaccines and propose a germ theory of disease. Pasteur's theory was in direct contradiction to current theories of disease, such as the miasm theory. It was only the evidence presented by Robert Koch in 1891, for which he was awarded the Nobel Prize in 1905, that confirmed that micro-organisms were the cause of infectious diseases. Viruses were confirmed as human pathogens in 1901, when Walter Reed discovered the yellow fever virus.

**Question 0**

Who won the Nobel Prize in 1905?

**Question 1**

What did Robert Koch point to as the cause of infectious diseases?

**Question 2**

Which virus did Walter Reed discover?

**Question 3**

When was the first known historical mention of immunity?

**Question 4**

What is the science that studies the structure and function of the brain?

**Question 5**

When is the last known mention of immunity?

**Question 6**

Which scientist experimented with snake venom in the 1700s?

**Question 7**

Whose theories supported the miasma theory?

**Question 8**

When did Robert Koch discover the yellow fever virus?

**Text number 3**

The immune system protects organisms against infections with a layered and increasingly specific defence. Simply put, physical barriers prevent pathogens such as bacteria and viruses from entering the body. If a pathogen breaks down these barriers, the innate immune system provides an immediate but non-specific response. Innate immune systems exist in all plants and animals. If pathogens manage to evade the innate response, vertebrates have a second layer of protection, the adaptive immune system, which is activated by the innate response. In this case, the immune system adapts its response during infection to improve recognition of the pathogen. This enhanced response is then retained after pathogen eradication as an immunological memory, allowing the adaptive immune system to attack more rapidly and vigorously whenever a pathogen is encountered.

**Question 0**

What types of immune systems are found in all plants and animals?

**Question 1**

Which immune system is activated in the innate response?

**Question 2**

What allows the adaptive immune system to react faster and more strongly each time a pathogen is encountered?

**Question 3**

What is the first line of defence against pathogens, preventing them from entering the body?

**Question 4**

What predisposes organisms to infection?

**Question 5**

What is not prevented from entering the body?

**Question 6**

What is activated before the innate response in vertebrates?

**Question 7**

What do you get rid of after the pathogen has been eliminated?

**Question 8**

What makes the organism attack more slowly and weakly each time a pathogen is encountered?

**Text number 4**

Both innate and adaptive immunity depend on the immune system's ability to distinguish between self and non self molecules. In immunology, self-molecules are those parts of the organism's body that the immune system can distinguish from foreign substances. Similarly, non-self molecules are molecules that are recognised as foreign molecules. A class of non-self molecules are called antigens (short for antibody generators) and are defined as substances that bind to specific immune receptors and trigger an immune response.

**Question 0**

The adaptive immune system needs to distinguish between which types of molecules?

**Question 1**

In immunology, which molecules are parts of the body of an organism?

**Question 2**

Which molecules does the immune system recognise as foreign?

**Question 3**

What is the abbreviation for anti-body generators?

**Question 4**

What do antigens bind to in order to trigger an immune response?

**Question 5**

What does not depend on the immune system's ability to distinguish between itself and others?

**Question 6**

What is a single-class self-molecule?

**Question 7**

What can't the immune system separate from foreign substances?

**Question 8**

What do self-molecules bind to?

**Question 9**

What happens when the antigen does not bind to the immune receptor?

**Text number 5**

Micro-organisms or toxins that enter the body encounter the cells and mechanisms of the innate immune system. The innate response is usually triggered when microbes are recognised by pattern recognition receptors that recognise components conserved in large groups of microorganisms, or when damaged, injured or stressed cells send alarm signals, many (but not all) of which are recognised by the same receptors as those that recognise pathogens. Innate immune defence is non-specific, i.e. these systems respond to pathogens in a general way. This system does not confer long-lasting immunity against the pathogen. The innate immune system is the dominant host defence system in most organisms.

**Question 0**

Which part of the innate immune system recognises microbes and triggers the immune response?

**Question 1**

What is the dominant defence system for most organisms?

**Question 2**

What broad groups of components recognise image recognition receptors?

**Question 3**

The innate immune system reacts in a general way, i.e. what?

**Question 4**

What are the toxins that do not enter the body?

**Question 5**

What triggers the innate response to disarm?

**Question 6**

Which cells do not send alarm signals?

**Question 7**

Which defence mechanisms respond to pathogens in a particular way?

**Question 8**

Which system gives an organism a long-lasting immunity against a pathogen?

**Text number 6**

Several barriers, such as mechanical, chemical and biological barriers, protect organisms from infection. The waxy cuticle of many leaves, the outer skeleton of insects, the shells and membranes of externally deposited eggs and the skin are examples of mechanical barriers that are the first line of defence against infection. However, since organisms cannot be completely sealed off from their environment, other systems protect the body's openings, such as the lungs, intestines and urinary tract. In the lungs, coughing and sneezing mechanically remove pathogens and other irritants from the airways. The flushing action of tears and urine also mechanically expels pathogens, while mucus secreted by the respiratory tract and gastrointestinal tract traps and imprisons micro-organisms.

**Question 0**

What is the mechanical barrier that protects the insect?

**Question 1**

What is an example of a mechanical barrier in leaves?

**Question 2**

Which reactions protect the lungs by mechanically removing pathogens from the airways?

**Question 3**

What is secreted by the respiratory tract to trap micro-organisms?

**Question 4**

Which flushing action expels pathogens from the eyes?

**Question 5**

What kind of barrier does not protect organisms from infection?

**Question 6**

What is an example of a chemical barrier?

**Question 7**

What is the last line of defence against infection?

**Question 8**

What removes pathogens from the digestive tract?

**Question 9**

What is not an example of a mechanical barrier?

**Text number 7**

Chemical barriers also protect against infection. The skin and respiratory tract secrete antimicrobial peptides such as β-defensins. Enzymes in saliva, tears and breast milk, such as lysozyme and phospholipase A2, are also antibacterial. Vaginal secretions act as a chemical barrier after menopause, becoming slightly acidic, while semen contains defences and zinc that kill pathogens. In the stomach, stomach acid and proteases act as effective chemical defences against ingested pathogens.

**Question 0**

What is the name of the anitmicrobial peptides secreted by the skin?

**Question 1**

Which salivary enzymes are antibacterial in nature?

**Question 2**

What does semen contain to kill pathogens?

**Question 3**

Which compounds in the stomach protect against ingested pathogens?

**Question 4**

Vaginal secretions act as a chemical protective barrier after what?

**Question 5**

What does the respiratory tract secrete to promote infection?

**Question 6**

Which enzyme is not antibacterial?

**Question 7**

In which liquids are enzymes not present?

**Question 8**

When does the acidity of vaginal secretions decrease?

**Question 9**

What provides chemical protection against pathogens?

**Text number 8**

Within the urinary tract and digestive tract, foreign bacteria act as biological barriers by competing with pathogenic bacteria for food and space and, in some cases, by altering environmental conditions such as pH or available iron. This reduces the likelihood that pathogens will reach sufficient levels to cause disease. However, because most antibiotics do not specifically target bacteria or affect fungi, oral antibiotics can lead to fungal "overgrowth" and cause conditions such as vaginal candidiasis (yeast infections). There is good evidence that restoring pure cultures of probiotic flora, such as lactobacilli commonly found in unpasteurised yoghurt, helps to restore a healthy balance of microbial populations in children with intestinal infections, and encouraging preliminary data from studies of bacterial gastroenteritis, inflammatory bowel disease, urinary tract infections and post-operative infections.

**Question 0**

What acts as a biological barrier by competing for space and food in the digestive tract?

**Question 1**

Most antibiotics target bacteria and do not affect any class of organisms?

**Question 2**

What probiotic flora can be found in unpasteurised yoghurt?

**Question 3**

Commensal flora can change what specific conditions in their environment in the digestive tract?

**Question 4**

In which habitats do pathogens thrive with co-occurring vegetation?

**Question 5**

What does not compete for food and space with non-native flora?

**Question 6**

Which medicine can lead to a reduction in fungi?

**Question 7**

Which food disturbs the balance of microbial populations?

**Question 8**

What is an infection caused by bacterial overgrowth?

**Text number 9**

Inflammation is one of the immune system's first reactions to infection. Symptoms of inflammation include redness, swelling, fever and pain due to increased blood flow to the tissue. Inflammation is produced by eicosanoids and cytokines released from injured or infected cells. Eicosanoids include prostaglandins, which cause fever and vasodilatation associated with inflammation, and leukotrienes, which attract certain white blood cells (leukocytes). Common cytokines include interleukins, which are responsible for communication between white blood cells, chemokines, which promote chemotaxis, and interferons, which have antiviral effects such as stopping protein synthesis in the host cell. Growth factors and cytotoxic factors may also be released. These cytokines and other chemicals recruit immune cells to the site of infection and promote healing of damaged tissue after pathogen clearance.

**Question 0**

What is one of the immune system's first reactions to infection?

**Question 1**

What causes the symptoms of inflammation?

**Question 2**

What compounds are released by injured or infected cells that trigger inflammation?

**Question 3**

Eicosanoids contain what compounds that cause fever and vasodilatation?

**Question 4**

Which cytokines are responsible for communication between white blood cells?

**Question 5**

What is one of the immune system's last responses to infection?

**Question 6**

What is not a symptom of inflammation?

**Question 7**

What substances do healthy cells produce?

**Question 8**

What is a rare cytokine?

**Question 9**

Which chemical keeps immune cells away from the site of infection?

**Text number 10**

Phagocytosis is an important part of innate cellular immunity and is carried out by cells, called phagocytes, which engulf or eat pathogens or particles. Phagocytes normally circulate in the body in search of pathogens, but cytokines can invite them to specific sites. Once a phagocyte has ingested a pathogen, it remains in an intracellular vesicle called a phagosome, which later fuses with another vesicle called a lysosome to form a phagolysosome. The pathogen is killed by digestive enzymes or by a respiratory burst that causes free radical release into the phagolysosome. Phagocytosis evolved as a means of food acquisition, but this role was extended in phagocytes to include ingestion of pathogens as a defence mechanism. Phagocytosis probably represents the oldest form of host defence, as phagocytes have been identified in both vertebrates and invertebrates.

**Question 0**

What types of cells engulf or eat pathogens and foreign particles?

**Question 1**

What can be used to call phagocytes to a specific location?

**Question 2**

Once a phagocyte has ingested a pathogen, it is trapped in which vesicle?

**Question 3**

What is formed when a phagosome fuses with a lysosome?

**Question 4**

Phagocytosis first evolved as a way of doing what?

**Question 5**

What patrols the body looking for phagocytes?

**Question 6**

What drives phagocytes away from certain areas?

**Question 7**

Where does the phagocyte attach to the pathogen?

**Question 8**

How does a pathogen kill a phagocyte?

**Question 9**

What was the role of phagocytosis before it was used for nutrient acquisition?

**Text number 11**

Neutrophils and macrophages are phagocytes that travel throughout the body in pursuit of invading pathogens. Neutrophils are commonly found in the circulation and are the most abundant type of phagocyte, usually accounting for 50-60% of all leukocytes in the circulation. During the acute phase of inflammation, especially following bacterial infection, neutrophils migrate towards the site of infection by a process called chemotaxis and are usually the first cells to arrive at the site of infection. Macrophages are versatile cells that live in tissues and produce a wide range of chemicals, including enzymes, complement proteins and regulatory factors such as interleukin 1. Macrophages also act as scavengers, removing worn-out cells and other waste from the body, and as antigen-presenting cells that activate the adaptive immune system.

**Question 0**

Which two types of phagocytes travel through the body to search for invading pathogens?

**Question 1**

What are the most common phagocytes?

**Question 2**

What percentage of leukocytes are neutrophils?

**Question 3**

What is the process by which neutrophils move towards the site of inflammation?

**Question 4**

What is the regulatory factor produced by macrophages?

**Question 5**

What are pathogens that travel through the body in search of phagocytes?

**Question 6**

Where are neutrophils rarely found?

**Question 7**

What is the least common type of phagocyte?

**Question 8**

What are usually the last cells to arrive at the site of infection?

**Question 9**

Which cell cannot act as a scavenger?

**Text number 12**

Leukocytes (white blood cells) act like independent single-celled organisms and are another part of the innate immune system. Innate leukocytes include phagocytes (macrophages, neutrophils and dendritic cells), mast cells, eosinophils, basophils and natural killer cells. These cells recognise and eliminate pathogens either by attacking larger pathogens through contact or by ingesting and then killing microorganisms. Innate cells are also important mediators in the activation of the adaptive immune system.

**Question 0**

What are white blood cells called?

**Question 1**

Which cells are the second branch of the innate immune system?

**Question 2**

Innate cells can mediate the activation of which branch of the immune system?

**Question 3**

What are the three different types of phagocyte?

**Question 4**

Which cells cannot function independently?

**Question 5**

What are leukocytes?

**Question 6**

Which cell is not a congenital leukocyte?

**Question 7**

Which cells attack smaller pathogens through contact?

**Question 8**

What are the least important mediators in the activation of the adaptive immune system?

**Text number 13**

Dendritic cells (DCs) are phagocytes in tissues that are in contact with the external environment; they are therefore mainly located in the skin, nose, lungs, stomach and intestines. They are so named because they resemble the dendrites of nerve cells, as both have many spine-like projections, but dendritic cells are not in any way connected to the nervous system. Dendritic cells act as a link between body tissues and the innate and adaptive immune systems, as they present antigens to T cells, one of the main cell types of the adaptive immune system.

**Question 0**

What is the name given to phagocytes, which are located in tissues in contact with the external environment?

**Question 1**

Dendritic cells are so named because they resemble what?

**Question 2**

What are some of the key cell types of the adaptive immune system?

**Question 3**

Dendritic cells present antigens to which cells of the adaptive nervous system?

**Question 4**

What are phagocytes in tissues that are in contact only with the internal environment?

**Question 5**

In which areas are dendritic cells not found?

**Question 6**

What is so named because it resembles dendritic cells?

**Question 7**

What do dendritic cells and nerve cell dendrites not look like?

**Question 8**

What acts as a barrier between the body's tissues and the nervous system?

**Text number 14**

Natural killer cells, or NK cells, are part of the innate immune system that does not directly attack invading microbes. Rather, NK cells destroy damaged host cells, such as tumour cells or virus-infected cells, and recognise such cells as the so-called "missing self". This term describes cells that are low in a cell surface marker called MHC I (major histocompatibility complex) - a condition that can arise in viral infections of host cells. They were named "natural killers" because it was originally thought that they did not require activation to kill cells lacking "self". For many years it was unclear how NK cells recognise tumour cells and infected cells. It is now known that the MHC structure on the surface of these cells changes and NK cells are activated by recognising the 'missing self'. NK cells do not recognise and attack normal cells in the body because they express intact self MHC antigens. These MHC antigens are recognised by killer cell immunoglobulin receptors (KIR), which essentially inhibit the activity of NK cells.

**Question 0**

What is the part of the innate immune system that does not attack microbes directly?

**Question 1**

Natural killer cells identify cells that should be targeted by a condition known as what?

**Question 2**

Missing self describes cells with only small amounts of what cell surface marker?

**Question 3**

Which NK cell receptor recognises MHC antigens from normal body cells?

**Question 4**

Which part of the innate immune system directly attacks microbes?

**Question 5**

What do NK cells protect?

**Question 6**

Why do NK cells attack normal cells in the body?

**Question 7**

How long was it clear how NK cells recognised tumours?

**Question 8**

What stimulates NK cells?

**Text number 15**

The adaptive immune system evolved in early vertebrates and allows for a stronger immune response and immunological memory, where each pathogen is "remembered" by a signature antigen. The adaptive immune response is antigen-specific and requires the recognition of certain "non-self" antigens during a process called antigen presentation. Antigen specificity allows the generation of responses that are tailored to specific pathogens or pathogen-infected cells. Memory cells maintain in the body the ability to generate such tailored responses. If a pathogen infects the body more than once, these special memory cells rapidly eliminate it.

**Question 0**

In which organisms did the adaptive immune system first evolve?

**Question 1**

The adaptive immune system recognises non-self-derived antigens in a process called why?

**Question 2**

Antigen specificity allows answers that are specific to certain types of what?

**Question 3**

What evolved in later vertebrates?

**Question 4**

Which immune response is not antigen-specific?

**Question 5**

What is not needed for an adaptive immune response?

**Question 6**

What enables responses that are not tailored to a specific pathogen?

**Question 7**

What is used to eradicate a pathogen once it has entered the body?

**Text number 16**

Both B and T cells have receptor molecules that recognise specific targets. T cells recognise a 'not-self' target, such as a pathogen, only after antigens (small fragments of the pathogen) have been processed and presented together with a 'self' receptor called the major histocompatibility complex (MHC) molecule. There are two main subtypes of T cells: the killer T cell and the helper T cell. In addition, there are regulatory T cells, whose role is to modulate the immune response. Killer T cells recognise only antigens bound to class I MHC molecules, whereas helper T cells and regulatory T cells recognise only antigens bound to class II MHC molecules. These two antigen presentation mechanisms reflect the different roles of the two types of T cells. The third, smaller subtype is γδ-T cells, which recognise intact antigens that are not bound to MHC receptors.

**Question 0**

What are the two main subtypes of T cells?

**Question 1**

What kind of T cells are used to modulate the immune response?

**Question 2**

Killer T cells can only recognise antigens linked to which molecules?

**Question 3**

Helper and regulatory T cells can only recognise antigens linked to which molecules?

**Question 4**

Which class of T cells recognises intact antigens that are not associated with MHC receptors?

**Question 5**

Which cells do not carry receptor molecules?

**Question 6**

What do T cells recognise before processing antigens?

**Question 7**

How many subtypes of B cells are there?

**Question 8**

How many roles do B cell types play?

**Question 9**

What do killer B cells recognise?

**Text number 17**

Killer T cells are a subset of T cells that kill cells infected or otherwise damaged or dysfunctional by viruses (and other pathogens). Like B cells, each type of T cell recognises a different antigen. Killer T cells are activated when their T cell receptor (TCR) binds to that particular antigen in complex with the MHC class I receptor of another cell. Recognition of this MHC:antigen complex is aided by the T cell co-receptor CD8. The T cell then travels throughout the body looking for cells where MHC I receptors carry this antigen. When the activated T cell contacts such cells, it releases cytotoxins such as perforin, which form pores in the plasma membrane of the target cell, allowing ions, water and toxins to enter. The entry of another toxin called granulysin (protease) causes apoptosis of the target cell. Killing T cells in host cells is particularly important in preventing viral replication. T cell activation is tightly controlled and usually requires a very strong MHC/antigen activation signal or additional activation signals from 'helper' T cells (see below).

**Question 0**

What kind of T cells kill cells infected by pathogens?

**Question 1**

Which receptor is used by killer T cells to bind to specific antigens complexed with the MHC class 1 receptor of another cell?

**Question 2**

Which T cell co-receptor helps to recognise the MHC antigen complex?

**Question 3**

When an activated killer T cell finds cells with specific antigens on their MHC 1 receptor, it releases cytotoxins such as what?

**Question 4**

Which toxin causes apoptosis of the target cell?

**Question 5**

Which cells help to grow cells infected by viruses?

**Question 6**

What do killer B cells kill?

**Question 7**

When do the killer T cells deactivate?

**Question 8**

Which co-receptor makes identification difficult?

**Question 9**

What allows ions, water and toxins to leave the membrane of the target cell?

**Text number 18**

Apu T cells express T cell receptors (TCRs) that recognise antigen bound to class II MHC molecules. The MHC:antigen complex is also recognised by the helper cell CD4 co-receptor, which recruits molecules within the T cell (e.g. Lck) that are responsible for T cell activation. The association of helper T cells with MHC antigen complexes is weaker than that of killer T cells, which means that many receptors (around 200-300) must bind to MHC antigens in the helper T cell to activate the helper cell, whereas killer T cells can be activated by binding to a single MHC antigen molecule. Activation of the helper T cell also requires longer binding to the antigen-presenting cell. Activation of a resting helper T cell causes it to release cytokines that affect many cell types. Cytokine signals produced by helper T cells enhance the microbicidal activity of macrophages and the activity of killer T cells. In addition, activation of helper T cells causes a strong up-regulation of molecules expressed on the T cell surface, such as CD40 ligand (also called CD154), which provides additional stimulatory signals normally required to activate antibody-producing B cells.

**Question 0**

Which co-receptor recruits molecules within the T cell that are responsible for cell activation?

**Question 1**

How many receptors in the helper T cell must be bound to the MHC:antigen complex for the cell to be activated?

**Question 2**

How many MHC: antigen complexes must the killer T cell receptors bind to in order to activate the cell?

**Question 3**

Activation of the helper T cell causes it to release what chemicals that affect the cell's function?

**Question 4**

What is the ligand on the cell surface that is upregulated after activation of helper T cells?

**Question 5**

What antigens are not recognised by Helper T cells?

**Question 6**

What has a stronger association with the MHC:antigen complex than killer T cells?

**Question 7**

What disables the activation of killer T cells?

**Question 8**

What do helper T-cells absorb?

**Question 9**

What do B cells help T cells produce?

**Text number 19**

Gamma delta T cells (γδ T cells) have an alternative T cell receptor (TCR) to CD4+ and CD8+ (αβ) T cells and share the same properties as helper T cells, cytotoxic T cells and NK cells. The conditions that trigger γδ T cell responses are not fully understood. Like other "unconventional" T cell subsets with invariant TCRs, such as CD1d-restricted natural killer T cells, γδ T cells walk the line between innate and adaptive immunity. On the other hand, γδ-T cells are part of adaptive immunity because they reorganize TCR genes to produce receptor diversity and can also develop a memory phenotype. On the other hand, different subsets are also part of the innate immune system, as restricted TCR or NK receptors can be used as pattern recognition receptors. For example, large numbers of human Vγ9/Vδ2 T cells react within hours to normal molecules produced by microbes, and highly restricted Vδ1+ T cells in the epithelium react to stressed epithelial cells.

**Question 0**

Gamma delta T cells share characteristics with which other T cell types?

**Question 1**

Gamma delta T cells have a different version of which receptor?

**Question 2**

Which types of T cells contribute to both innate and adaptive immunity?

**Question 3**

Gamma delta T cells reorganise TCR genes to produce what?

**Question 4**

What kind of human T cells react to common molecules produced by microbes?

**Question 5**

Which cells do not have an alternative T-cell receptor?

**Question 6**

Which cells do gamma delta T cells not share characteristics with?

**Question 7**

What is known about γδ T cells?

**Question 8**

What reacts in small amounts with common molecules produced by microbes?

**Text number 20**

The B cell recognises pathogens when antibodies on its surface bind to a specific foreign antigen. The B cell takes up this antigen-antibody complex and processes it into peptides by proteolysis. The B cell then displays these antigenic peptides on its surface on MHC class II molecules. This combination of MHC and antigen attracts the appropriate T helper cell, which releases lymphokines and activates the B cell. When the activated B cell begins to divide, its progeny (plasma cells) secrete millions of copies of an antibody that recognises this antigen. These antibodies circulate in the plasma and lymph node, bind to pathogens expressing the antigen and mark them for destruction by complement activation or for uptake and destruction by phagocytes. Antibodies can also neutralise challenges by directly binding to bacterial toxins or by disrupting receptors used by viruses and bacteria to infect cells.

**Question 0**

What type of cell recognises pathogens when antibodies on its surface form a complex with a particular foreign antigen?

**Question 1**

By what process is the antigen-antibody complex processed into peptides?

**Question 2**

What does the corresponding helper T cell release when it binds to the MHC:antigen complex of the B cell?

**Question 3**

When does the T-cell recognise pathogens?

**Question 4**

What are peptides processed for?

**Question 5**

What attracts a suitable B oocyte?

**Question 6**

When do antibodies not circulate?

**Question 7**

What cannot be neutralised by antibodies?

**Text number 21**

When B and T cells become activated and start to proliferate, some of their offspring become long-lived memory cells. These memory cells remember every pathogen they encounter throughout the animal's lifetime and can mount a strong response if the pathogen is detected again. This is "adaptive" because it occurs during the lifetime of the individual as an adaptation to infection by that pathogen and prepares the immune system for future challenges. Immunological memory can be either passive short-term memory or active long-term memory.

**Question 0**

When B and T cells start to multiply, what do some of their progeny cells become?

**Question 1**

The function of long-lived memory cells is an example of what kind of immune response?

**Question 2**

What are the two forms of immunological memory?

**Question 3**

Long-lived memory cells can remember previous encounters with what?

**Question 4**

What happens when B and T cells are deactivated?

**Question 5**

Which cells will give a weak response if the pathogen is detected again?

**Question 6**

What is not a form of immunological memory?

**Question 7**

Why are memory cells not considered adaptive?

**Question 8**

Which cells cannot remember certain pathogens?

**Text number 22**

Newborn babies have no previous exposure to microbes and are particularly susceptible to infections. The mother provides several layers of passive protection. During pregnancy, a particular type of IgG antibody is passed from mother to baby directly across the placenta, so human babies are already born with a high level of antibodies with the same range of antigenic specificities as the mother. Breast milk, or colostrum, also contains antibodies that pass into the baby's gut and protect against bacterial infections until the newborn can synthesise its own antibodies. This is passive immunity because the fetus does not produce memory cells or antibodies itself - it just borrows them. This passive immunity is usually short-lived, lasting from a few days to several months. In medicine, protective passive immunity can also be artificially transferred from one individual to another with antibody-containing serum.

**Question 0**

Newborns are vulnerable to infections because they have not been exposed to what?

**Question 1**

Which antibody is passed from mother to baby through the placenta?

**Question 2**

How do antibodies enter the intestines of an infant?

**Question 3**

Antibodies passed from mother to infant via the placenta are an example of what type of short-lived immunity?

**Question 4**

Which people are least susceptible to infection?

**Question 5**

How many shelters does the father provide?

**Question 6**

Which antibody is passed from father to baby?

**Question 7**

What's not in breast milk?

**Question 8**

What cannot be artificially transferred from one person to another?

**Text number 23**

Hormones can act as immunomodulators, altering the sensitivity of the immune system. For example, female sex hormones are known immunostimulators of both adaptive and innate immune responses. Some autoimmune diseases, such as lupus erythematosus, predominantly affect women and their onset often coincides with puberty. In contrast, male sex hormones such as testosterone appear to be immunosuppressive. Other hormones also appear to regulate the immune system, notably prolactin, growth hormone and vitamin D.

**Question 0**

Hormones can alter the sensitivity of the immune system, so they can be called why?

**Question 1**

Female sex hormones are immunostimulants that stimulate what immune responses?

**Question 2**

What is the autoimmune disease that primarily affects women?

**Question 3**

What is the effect of testosterone on the male immune system?

**Question 4**

What keeps the immune system's sensitivity at the same level?

**Question 5**

When do autoimmune diseases often strike men?

**Question 6**

What is the hormone that does not affect the immune system?

**Question 7**

Which male sex hormone is an immunostimulant?

**Question 8**

What is the autoimmune disease that most often strikes men?

**Text number 24**

Sleep-deprived individuals may have impaired active immune responses, which may result in lower antibody production and immune response than a well-rested person. In addition, proteins such as NFIL3, which have been shown to be closely related to both T cell differentiation and circadian rhythms, may be affected by disruption of natural light and dark cycles due to sleep deprivation, shift work, etc. As a result, these disturbances can lead to an increase in chronic diseases such as heart disease, chronic pain and asthma.

**Question 0**

What is a protein that is closely related to circadian rhythms?

**Question 1**

Sleep disorders can lead to an increase in which chronic diseases?

**Question 2**

What kind of deficiency leads to a weakened immune response and reduced antibody production?

**Question 3**

What has a greater impact during sleep deprivation?

**Question 4**

When is antibody production higher than normal?

**Question 5**

Which protein does not affect T-cell differentiation?

**Question 6**

What chronic diseases can cause sleep deprivation?

**Question 7**

What is not affected by natural light and dark cycles?

**Text number 25**

It has been suggested that the gradual decline in hormone levels with age is partly responsible for the reduced immune response in older people. On the other hand, the immune system regulates some hormones, in particular thyroid hormone. Age-related decline in immune function is also associated with lower vitamin D levels in older people. As people age, two things happen that negatively affect their vitamin D levels. First, they stay indoors more because of reduced activity. This means they get less sunlight and therefore produce less cholecalciferol through UVB radiation. Secondly, as people age, the skin is no longer able to produce vitamin D as well.

**Question 0**

What is partly responsible for the reduced immune response in older people?

**Question 1**

What does your skin produce less of as you age?

**Question 2**

Which signalling molecules are regulated by the immune system?

**Question 3**

Older people get less sun and produce less of what chemical through UVB radiation?

**Question 4**

What increases with age?

**Question 5**

What causes increased hormone levels in ageing adults?

**Question 6**

Which hormones are independent of the immune system?

**Question 7**

What causes elevated vitamin D levels in elderly people?

**Question 8**

What produces more vitamin D as people age?

**Text number 26**

The immune system's main response to tumours is to destroy abnormal cells with killer T cells, sometimes with the help of helper T cells. Tumour antigens are expressed on MHC class I molecules in the same way as viral antigens. This allows killer T cells to recognise the tumour cell as abnormal. NK cells also kill tumour cells in the same way, especially if there are fewer MHC class I molecules on the surface of the tumour cells than normal; this is a common phenomenon in tumours. Sometimes antibodies are formed against tumour cells, allowing them to be destroyed by the complement system.

**Question 0**

What types of immune cells help destroy abnormal cells in tumours?

**Question 1**

What type of molecule is abundant on the surface of tumour cells?

**Question 2**

Tumour antigens complex with MHC class I molecules in the same way as which antigens?

**Question 3**

What molecules does the immune system produce to enable the complement system to destroy the tumour?

**Question 4**

What cells are used to proliferate abnormal cells?

**Question 5**

What cells are assisted by B helper cells?

**Question 6**

Which antigens occur differently from viral antigens?

**Question 7**

How do helper T cells recognise killer T cells?

**Question 8**

What antibodies will never be created to fight back?

**Text number 27**

Unlike animals, plants do not have phagocytic cells, but many plant immune responses involve systemic chemical signals that are transmitted through the plant. Individual plant cells respond to pathogen-associated molecules called pathogen-associated molecular patterns (PAMPs). When a part of the plant becomes infected, the plant produces a local hypersensitivity response in which cells at the site of infection rapidly undergo apoptosis to prevent the spread of disease to other parts of the plant. Systemic acquired resistance (SAR) is a defence response used by plants to make the whole plant resistant to a particular infectious agent. RNA silencing mechanisms are particularly important in this systemic response because they can prevent viral replication.

**Question 0**

What kind of immune cells are missing in plants?

**Question 1**

Plant cells react to pathogen-related molecules called what?

**Question 2**

By what process do the cells of the plant's infection site prevent the spread of the disease?

**Question 3**

What is a kind of defence reaction that makes the whole plant resistant to a particular agent?

**Question 4**

What is the mechanism that allows plants to prevent viruses from multiplying?

**Question 5**

What cells do plants and animals have?

**Question 6**

What happens when all parts of the plant become infected?

**Question 7**

What happens to cells far from the site of infection?

**Question 8**

Which cells undergo slow apoptosis?

**Question 9**

What is irrelevant about SAR?

**Text number 28**

Overactive immune responses are the second extreme of immune dysfunction, especially autoimmune diseases. In these cases, the immune system is unable to distinguish between self and non-self correctly and attacks a part of the body. Under normal conditions, many T cells and antibodies react to 'self' peptides. One function of specialised cells (located in the thymus and bone marrow) is to present self-antigens produced throughout the body to young lymphocytes and to eliminate those cells that recognise self-antigens, thus preventing autoimmunity.

**Question 0**

Which diseases are the result of an overactive immune response?

**Question 1**

In autoimmune diseases, the immune system does not distinguish between which types of cells?

**Question 2**

Where are the specialised cells that eliminate cells that recognise self-antigens?

**Question 3**

What kind of peptides are produced by T cells and antibodies under normal conditions?

**Question 4**

What disorder causes the immune system not to distinguish between self and non-self?

**Question 5**

Which cell never reacts with self-forming peptides?

**Question 6**

What is the role of specialised cells in the brain?

**Question 7**

What cells does the immune system not eliminate?

**Question 8**

Where are the specialised cells not located?

**Text number 29**

Immune deficiencies occur when one or more parts of the immune system are not working properly. The immune system's ability to respond to pathogens is impaired in both the young and the elderly, and immune responses begin to deteriorate around the age of 50 due to immunosenescence. In developed countries, obesity, alcoholism and drug use are common causes of immune dysfunction. However, malnutrition is the most common cause of immune deficiency in developing countries. An inadequate protein diet is associated with impaired cell-mediated immunity, complement activity, phagocyte function, IgA antibody levels and cytokine production. In addition, loss of the thymus at an early age due to genetic mutation or surgical removal leads to severe immune deficiency and high susceptibility to infection.

**Question 0**

What kind of disorders occur when part of the immune system is not active?

**Question 1**

In which two age groups does the immune system become weaker?

**Question 2**

At what age do immune responses typically start to decline?

**Question 3**

What are some of the reasons for reduced immune function in developed countries?

**Question 4**

What is the most common cause of immunodeficiency in developing countries?

**Question 5**

What happens when all parts of the immune system are active?

**Question 6**

Which people have the strongest immune systems?

**Question 7**

What is the rarest cause of immune dysfunction in developing countries?

**Question 8**

What causes a diet with too much protein?

**Question 9**

What does losing the thymus at an early age prevent?

**Text number 30**

Long-term active memory is acquired after infection by activating B and T cells. Active immunity can also be created artificially by vaccination. The principle of vaccination (also called immunisation) is to introduce the antigen of a pathogen in order to stimulate the immune system and develop specific immunity against that pathogen without causing disease associated with that organism. This deliberate induction of an immune response is successful because it exploits the natural specificity of the immune system and its inducibility. As infectious diseases remain one of the leading causes of death in the human population, vaccination is the most effective immune manipulation that mankind has ever developed.

**Question 0**

What is the process by which active immunity can be artificially created?

**Question 1**

What is the vaccination process, also called?

**Question 2**

What is introduced in the vaccination process to create specific immunity?

**Question 3**

What feature of the human immune system is used to make vaccination successful?

**Question 4**

When is active short-term memory acquired?

**Question 5**

Which cells are not involved in active long-term memory?

**Question 6**

Which artificial mode of immune propagation causes the disease?

**Question 7**

What vaccines do not do?

**Question 8**

What is one of the rarest causes of death in humans?

**Text number 31**

The success of each pathogen depends on its ability to evade the host's immune responses. Therefore, pathogens have developed several methods that allow them to successfully infect the host while avoiding detection or destruction by the immune system. Bacteria often overcome physical barriers by secreting enzymes that fuse the barrier, for example by using the type II secretion system. Alternatively, they can use the type III secretion system to push a hollow tube into the host cell, providing a direct route for proteins to move from the pathogen to the host cell. These proteins are often used to shut down host defences.

**Question 0**

Bacteria often secrete what proteins in order to ingest a physical barrier?

**Question 1**

What type of infection control involves inserting a hollow tube into a host cell?

**Question 2**

In type III secretion, proteins are transported to the host cell to do what?

**Question 3**

The success of pathogens is based on their ability to do what?

**Question 4**

What does the failure of a pathogen depend on?

**Question 5**

How do viruses overcome physical barriers?

**Question 6**

How do bacteria transfer proteins from host to pathogen?

**Question 7**

What can't bacteria excrete?

**Question 8**

What is used to extinguish pathogen defences?

**Text number 32**

In the mid-1950s, Frank Burnet, inspired by Niels Jernes' proposal, formulated the clone selection theory of immunity (CST). Based on CST, Burnet developed a theory of how the immune response is triggered according to the distinction between self and non-self: 'self' components (body components) do not trigger a destructive immune response, while 'non-self' entities (pathogens, allograft) trigger a destructive immune response. The theory was later modified to reflect new findings concerning histocompatibility or the complex "dual-signal" activation of T cells. The self/non-self theory of immunity and the self/non-self vocabulary have been criticised, but remain very influential.

**Question 0**

Who formulated the idea of the clonal selection theory of immunity?

**Question 1**

What are two examples of non-essential entities according to Frank Burnet's theory?

**Question 2**

What is meant by the complex "two-signal" activation of T cells?

**Question 3**

Which other scientist influenced Frank Burnet when he formulated his theory of immunity?

**Question 4**

Which theory was formulated by Niels Jerne?

**Question 5**

Who did Frank Burnet inspire with his proposal?

**Question 6**

Which theory of immunity is no longer relevant?

**Question 7**

What did Jerne develop from the CST?

**Question 8**

What did Frank Burnet design before the 1950s?

**Text number 33**

NSAIDs are often used to control the effects of inflammation. Glucocorticoids are the most effective of these drugs; however, these drugs can have many unwanted side effects, such as central nervous system obesity, hyperglycaemia and osteoporosis, and their use must be strictly controlled. Lower doses of NSAIDs are often used in combination with cytotoxic or immunosuppressive drugs such as methotrexate or azathioprine. Cytotoxic drugs inhibit the immune response by killing dividing cells, such as activated T cells. However, the killing is indiscriminate and also affects other continuously dividing cells and their organs, causing toxic side effects. Immunosuppressive drugs, such as cyclosporine, prevent T cells from responding correctly to signals by blocking signal transduction pathways.

**Question 0**

What are the most effective NSAIDs?

**Question 1**

Low doses of NSAIDs are sometimes used with which class of medicines?

**Question 2**

What are two examples of cytotoxic or immunosuppressive drugs?

**Question 3**

What is an example of an immunosuppressive drug that inhibits T-cell activity by altering signal transduction pathways?

**Question 4**

What is used to boost the effects of inflammation?

**Question 5**

What are the least effective NSAIDs?

**Question 6**

What is not a side effect of glucocorticoids?

**Question 7**

What are higher doses of NSAIDs used for?

**Question 8**

Which drugs help T cells respond to signals correctly?

**Text number 34**

In contrast, during wakefulness, differentiated effector cells, such as cytotoxic natural killer cells and CTL (cytotoxic T lymphocytes), reach their peak to mount an effective response against invading pathogens. Anti-inflammatory molecules such as cortisol and catecholamines are also at their highest levels during waking hours. There are two theories as to why the pro-inflammatory state is reserved for sleep. First, inflammation would cause severe cognitive and physical impairments if it occurred during waking hours. Second, inflammation may occur during sleep due to the presence of melatonin. Inflammation causes a lot of oxidative stress, and the presence of melatonin during sleep could actively counteract free radical production during this time.

**Question 0**

What are some examples of differentiated effector cells that peak at wake-up time?

**Question 1**

What are the two anti-inflammatory molecules that peak during waking hours?

**Question 2**

Inflammation occurs during sleep because which molecule is present?

**Question 3**

Melatonin during sleep can actively counteract the production of which?

**Question 4**

Which cells are at their lowest levels when people are awake?

**Question 5**

Why do differentiated effector cells decline during wakefulness periods?

**Question 6**

Which pro-inflammatory molecules are at their highest levels during waking hours?

**Question 7**

What could inflammation do during sleep cycles?

**Question 8**

What could promote the production of free radicals during sleep?

**Text number 35**

When a T-cell encounters a foreign pathogen, it expands the vitamin D receptor. This is essentially a signalling device that allows the T cell to bind to the active form of vitamin D, the steroid hormone calcitriol. T cells have a symbiotic relationship with vitamin D. In addition to expanding the vitamin D receptor and essentially asking to bind to the steroid hormone version of vitamin D, calcitriol, the T cell expresses the CYP27B1 gene, a gene responsible for converting the pre-hormone version of vitamin D, calcidiol, to the steroid hormone version, calcitriol. Only after binding to calcitriol can T cells perform their intended function. Other immune cells known to express CYP27B1 and thus activate vitamin D calcidiol include dendritic cells, keratinocytes and macrophages.

**Question 0**

What does the T cell expand when it encounters a foreign pathogen?

**Question 1**

What is the active form of vitamin D?

**Question 2**

What is the relationship between T-cells and vitamin D?

**Question 3**

Which gene is responsible for the conversion of calcidiol to calcitriol?

**Question 4**

Which immune cells other than T cells express CYP27B1?

**Question 5**

What does the pathogen do when it encounters the T-cell?

**Question 6**

Which cell binds to vitamin C?

**Question 7**

With which vitamin do T-cells have a parasitic relationship?

**Question 8**

What gene does the B cell express?

**Question 9**

Which gene converts calcitriol to calcidiol?

**Text number 36**

Model recognition receptors are proteins used by almost all organisms to recognise molecules associated with pathogens. Antimicrobial peptides, called defensins, are an evolutionarily conserved part of the innate immune response found in all animals and plants and represent the main form of systemic immunity in invertebrates. Most invertebrates also use complement and phagocytic cells. Ribonucleases and the RNA interference pathway are conserved in all eukaryotes and are thought to play a role in the immune response to viruses.

**Question 0**

What proteins do organisms use to identify molecules associated with pathogens?

**Question 1**

What is the main form of invertebrate systemic immunity, antimicrobial peptides?

**Question 2**

What cell type is also used for the immune response in most invertebrates?

**Question 3**

Which pathway that plays a role in the immune response against viruses is present in all eukaryotes?

**Question 4**

What proteins are used by very few organisms?

**Question 5**

Why are peptides called peptides that help microbes thrive?

**Question 6**

What does no invertebrate use?

**Question 7**

What does not play a role in the immune response of viruses?

**Question 8**

Where are ribonucleases not conserved?

**Text number 37**

The evolution of the adaptive immune system occurred in the ancestor of leukopods. Many of the classical molecules of the adaptive immune system (e.g. immunoglobulins and T-cell receptors) are present only in leucopods. However, a specific lymphocyte-derived molecule has been found in primitive jawless vertebrates such as lampreys and bullfishes. These animals have a large number of molecules called variable lymphocyte receptors (VLRs), which, like the antigen receptors of jawed vertebrates, are generated from only a small number (one or two) of genes. These molecules are thought to bind pathogenic antigens in the same way as antibodies and with the same specificity.

**Question 0**

Which adaptive immune molecules are only found in jawed vertebrates?

**Question 1**

What are two examples of primitive jawless vertebrates?

**Question 2**

Primitive jawless vertebrates have a set of receptors called what?

**Question 3**

Which part of the immune system evolved in the evolutionary ancestor of leukopods?

**Question 4**

What evolved in modern jawed vertebrates?

**Question 5**

What exists only outside of the jawed vertebrates?

**Question 6**

Which primitive jawed vertebrates do not contain molecules produced by lymphocytes?

**Question 7**

What is produced from a large number of genes?

**Question 8**

What molecules are rejected by pathogenic antigens?

**Text number 38**

It is likely that the multicomponent adaptive immune system evolved with the first vertebrates, as invertebrates do not produce lymphocytes or an antibody-based humoral response. However, many species use mechanisms that appear to be precursors to these components of vertebrate immunity. Immune systems are present in even the structurally simplest forms of life, and bacteria use a unique defence mechanism, called the restriction-modification system, to protect themselves against viral pathogens called bacteriophages. Prokaryotes also have acquired immunity through a system that uses CRISPR sequences to retain fragments of the genomes of phages with which they have previously been in contact, allowing them to prevent viral replication through a form of RNA interference. Attack elements of immune systems are also present in single-celled eukaryotes, but studies on their role in defence are scarce.

**Question 0**

Invertebrates do not produce which types of cells that are part of the vertebrate adaptive immune system?

**Question 1**

What is the main defence mechanism of bacteria?

**Question 2**

Bacteria use the restriction modification system to protect themselves against what pathogens?

**Question 3**

What is the mechanism by which prokaryotes retain phage gene fragments with which they have previously been in contact?

**Question 4**

Where is it unlikely that the first multicomponent, adaptive immune system emerged?

**Question 5**

What emerged in the latest vertebrates?

**Question 6**

What mechanisms are not used by many species?

**Question 7**

What kind of immunity do prokaryotes lack?

**Question 8**

What has often been studied in single-cell eukaryotes?

**Text number 39**

Immunology is strongly experimental in everyday practice, but it is also characterised by a constant theoretical attitude. Many theories have been put forward in the field of immunology from the late 19th century to the present day. In the late 19th and early 20th centuries, there was a battle between 'cellular' and 'humoral' theories of immunity. In particular, the cell-mediated theory of immunity advocated by Elie Metchnikoff held that cells - more specifically phagocytes - were responsible for immune responses. In contrast, according to the humoral theory of immunity, represented by Robert Koch and Emil von Behring, among others, the active immune factors were soluble components (molecules) found in the 'humoral substances' of the body, rather than in its cells.

**Question 0**

What were the two main theories of immunity in the late 19th century?

**Question 1**

Who was the main proponent of the cellular theory of immunity?

**Question 2**

According to Elie Metchnikoff's cell theory, which cells were responsible for the immune response?

**Question 3**

Which two scientists supported the humoral immunity theory?

**Question 4**

What was the body's immune system according to humoral immunity theory?

**Question 5**

What was proposed in immunology before the 1800s?

**Question 6**

Who was the main opponent of the cellular theory of immunity?

**Question 7**

Who were the main opponents of the humoral theory of immunity?

**Question 8**

What did cell theory say was in the humus of the body?

**Text number 40**

It is clear that some tumours bypass the immune system and develop into cancers. Tumour cells often have fewer MHC class I molecules on their surface, so they are not detected by killer T cells. Some tumour cells also release products that inhibit the immune response; for example, by secreting the cytokine TGF-β, which inhibits macrophages and lymphocytes. In addition, immunological tolerance to tumour antigens may develop, whereby the immune system no longer attacks tumour cells.

**Question 0**

What can tumours that are able to evade the body's immune response become?

**Question 1**

What receptors are often found in lower concentrations in tumour cells?

**Question 2**

What is the chemical secreted by tumours that suppresses the immune response?

**Question 3**

The cytokine TBF-B inhibits which cell types?

**Question 4**

What cannot evade the immune system?

**Question 5**

What makes the detection of killer T cells more likely?

**Question 6**

What do tumour cells release that strengthens the immune response?

**Question 7**

What does the cytokine TGF-β promote?

**Question 8**

What happens when the immune system loses tolerance to tumour antigens?

**Text number 41**

Hypersensitivity is an immune response that damages the body's own tissues. They are divided into four categories (Type I to IV) based on the mechanisms involved and the time course of the hypersensitivity reaction. Type I hypersensitivity is an immediate or anaphylactic reaction, often associated with allergy. Symptoms can range from mild discomfort to death. Type I hypersensitivity is mediated by IgE, which triggers degranulation of mast cells and basophils when the antigen cross-crosslinks. Type II hypersensitivity occurs when antibodies bind to antigens from the patient's own cells and mark them for destruction. This is also called antibody-dependent (or cytotoxic) hypersensitivity and is mediated by IgG and IgM antibodies. Immune complexes (aggregations of antigens, complement proteins, IgG and IgM antibodies) accumulating in different tissues trigger type III hypersensitivity reactions. Type IV hypersensitivity (also known as cell-mediated or delayed hypersensitivity) usually develops over two to three days. Type IV reactions occur in many autoimmune and infectious diseases, but may also be associated with contact dermatitis (poison ivy). These reactions are mediated by T cells, monocytes and macrophages.

**Question 0**

What is the name of the immune system response that damages the body's own tissues?

**Question 1**

How many classes of immune hypersensitivity are there?

**Question 2**

What kind of hypersensitivity is associated with allergies?

**Question 3**

Which chemical mediates type 1 hypersensitivity?

**Question 4**

Antibody-dependent hypersensitivity belongs to which category of hypersensitivity?

**Question 5**

What is the immune response that heals the body's own tissues?

**Question 6**

What is divided into five categories?

**Question 7**

What is not a symptom of type I hypersensitivity?

**Question 8**

What type of hypersensitivity takes two to three weeks to develop?

**Question 9**

What happens when antibodies do not bind to the patient's cells?

**Text number 42**

Many pathogens use an evasion strategy to evade the innate immune system by hiding in the cells of their host (also known as intracellular pathogenesis). In this case, the pathogen spends most of its life cycle inside the host cells, where it is protected from direct contact with immune cells, antibodies and complement. Examples of intracellular pathogens include viruses, the food poisoning bacterium Salmonella and the eukaryotic parasites that cause malaria (Plasmodium falciparum) and leishmaniasis (Leishmania spp.). Other bacteria, such as Mycobacterium tuberculosis, live inside a protective capsule that prevents lysis of the complement. Many pathogens secrete compounds that weaken or misdirect the host immune response. Some bacteria form biofilms to protect themselves from immune cells and proteins. Such biofilms are found in many successful infections, for example the chronic Pseudomonas aeruginosa and Burkholderia cenocepacia infections typical of cystic fibrosis. Other bacteria produce surface proteins that bind to antibodies, rendering them ineffective, such as Streptococcus (protein G), Staphylococcus aureus (protein A) and Peptostreptococcus magnus (protein L).

**Question 0**

What is the process by which pathogens evade the immune system by hiding inside host cells?

**Question 1**

Which food-borne bacterium is an example of intracellular pathogenesis?

**Question 2**

What is the eukaryotic parasite that causes malaria?

**Question 3**

Which bacterium lives inside the protective capsule that prevents cells from lysing?

**Question 4**

What protein does Staphylococcus aureus produce to make antibodies ineffective?

**Question 5**

What strategies do pathogens use to target the innate immune system?

**Question 6**

What is it called when a pathogen spends most of its life cycle outside the host cell?

**Question 7**

Where does the pathogen come into direct contact with immune cells, antibodies and complement?

**Question 8**

What secretes pathogens that boost the host's immune response?

**Question 9**

What do bacterial surface proteins not bind to?

**Text number 43**

The mechanisms used to circumvent the adaptive immune system are more complex. The simplest is to rapidly modify the non-essential epitopes (amino acids and/or sugars) on the surface of the pathogen and keep the essential epitopes hidden. This is called antigenic variation. An example is HIV, which mutates rapidly, so the proteins in its viral envelope, which are essential for it to enter the host cell, are constantly changing. These frequent changes in antigens may explain the failure of vaccines against this virus. The Trypanosoma brucei parasite uses a similar strategy, constantly changing one type of surface protein for another, allowing it to stay one step ahead of the antibody response. Masking antigens with host molecules is another common strategy to avoid detection by the immune system. In HIV, the envelope covering the virion is formed by the outermost membrane of the host cell; such 'self-enveloped' viruses make it difficult for the immune system to recognise them as 'non-self' structures.

**Question 0**

What is the process of bypassing the adaptive immune system by attaching irrelevant epitopes to it?

**Question 1**

What is an example of a virus that uses antigenic variation?

**Question 2**

What is an example of a parasite that has used an antigenic exchange strategy to avoid destruction?

**Question 3**

Which compounds can be masked by host cell molecules to avoid detection of the virus?

**Question 4**

What are less complex mechanisms used for?

**Question 5**

What is the most complex way to avoid adaptive immunity?

**Question 6**

What is a pathogen that does not use antigenic variation?

**Question 7**

What does not explain the failure of vaccines against HIV?

**Question 8**

What is the parasite that always uses the same surface protein?

**Text number 44**

Another important role of the immune system is to identify and eliminate tumours. This is called immune surveillance. Mutated cells in tumours express antigens that are not present in normal cells. These antigens appear foreign to the immune system and their presence triggers immune cells to attack the mutated tumour cells. The antigens expressed by tumours have several sources; some are derived from oncogenic viruses, such as the human papillomavirus that causes cervical cancer, while others are the organism's own proteins, which are present in low levels in normal cells but high levels in tumour cells. One example is an enzyme called tyrosinase, which when expressed at high levels turns certain skin cells (e.g. melanocytes) into tumours called melanoma. A third possible source of tumour antigens are proteins, usually important in regulating cell growth and survival, which usually mutate into cancer-causing molecules called oncogenes.

**Question 0**

What is the process by which the immune system recognises tumours?

**Question 1**

Which virus causes cervical cancer in humans?

**Question 2**

What is an example of an enzyme that can turn skin cells into tumours when expressed at high levels?

**Question 3**

What are skin cancers called?

**Question 4**

What are skin cells called that can turn into tumours?

**Question 5**

What is not an important function of the immune system?

**Question 6**

What do tumours express that is also present in normal cells?

**Question 7**

What is not the cause of tumour antigens?

**Question 8**

What happens when tyrosinase is expressed at low levels?

**Question 9**

What is the fourth possible source of tumour antigens?

**Text number 45**

Larger drugs (> 500 Da) may cause a neutralising immune response, especially if administered repeatedly or in higher doses. This limits the effectiveness of drugs based on larger peptides and proteins (typically larger than 6000 Da). In some cases, the drug itself is not immunogenic, but may be administered in combination with an immunogenic compound, as is sometimes the case with Taxol. Computational methods have been developed to predict the immunogenicity of peptides and proteins, which are particularly useful for designing therapeutic antibodies, assessing the likely virulence of viral supernatant mutations and validating proposed peptide-based drug therapies. Early techniques were mainly based on the observation that hydrophilic amino acids are over-represented in epitope regions over hydrophobic amino acids; however, more recent developments are based on machine learning techniques using databases of existing known epitopes, usually of well-studied viral proteins, as the training set. A publicly available database has been established to catalogue epitopes of pathogens known to be identifiable by B cells. The emerging field of bioinformatics-based immunogenicity studies is called immunoinformatics. Immunoproteomics is the study of large sets of proteins involved in the immune response (proteomics).

**Question 0**

What sizes and sizes of drugs can be used to achieve a neutralising immune response?

**Question 1**

Which amino acids are over-represented in epitope regions?

**Question 2**

What is called research on proteins involved in the immune response?

**Question 3**

Is there a public database of pathogen epitopes known to be identified by which cells?

**Question 4**

What is the name given to the study of immunogenicity using bioinformatics?

**Question 5**

What kind of immune response do smaller drugs cause?

**Question 6**

What does neutralising immune response mean for drugs based on smaller peptides and proteins?

**Question 7**

What is not a method used to predict the immunogenicity of peptides and proteins?

**Question 8**

What is under-represented in epitope areas?

**Question 9**

What is small protein array research?

**Text number 46**

In addition to the negative consequences of sleep deprivation, sleep and its intertwined circadian system have been shown to have strong immunological regulatory effects, affecting both innate and adaptive immunity. First, during the early slow-wave sleep phase, a sudden drop in blood levels of cortisol, adrenaline and noradrenaline induces an increase in blood levels of leptin, pituitary growth hormone and prolactin. These signals induce a pro-inflammatory state by producing the pro-inflammatory cytokines interleukin-1, interleukin-12, TNF-alpha and IFN-gamma. These cytokines then stimulate immune functions such as immune cell activation, proliferation and differentiation. During this period, undifferentiated or less differentiated ones, such as naïve and central nervous system memory T cells, reach their peak (i.e. during the slowly evolving adaptive immune response). In addition to these effects, the environment of hormones produced during this period (leptin, pituitary growth hormone and prolactin) supports the interaction between APCs and T cells, the shift of the Th1/Th2 cytokine balance in a Th1-supportive direction, the increase in total Th cell proliferation and the migration of naïve T cells into lymph nodes. This environment is also thought to support the formation of a long-lasting immune memory through the triggering of Th1 immune responses.

**Question 0**

A decrease in blood levels of cortisol and epinephrine leads to an increase in levels of which hormones?

**Question 1**

Hormones released during sleep support the interaction between T cells and which species?

**Question 2**

Sleep hormones shift the cytokine balance towards which cytokine?

**Question 3**

The release of the sleep hormone supports immune memory by triggering which immune response?

**Question 4**

What is not affected by sleep?

**Question 5**

What rises during the early slow wave tidal wave phase?

**Question 6**

What slows down immune function during sleep?

**Question 7**

What hormones are mostly produced during wakefulness?

**Question 8**

What hormones produced during this period prevent interaction?

**Text number 47**

Pathogens can evolve and adapt rapidly and thus evade detection and neutralisation by the immune system; however, several defence mechanisms have also evolved to detect and neutralise pathogens. Even simple unicellular organisms, such as bacteria, have a rudimentary immune system in the form of enzymes that protect against bacteriophage infections. Other basic immune mechanisms evolved in ancient eukaryotes and still exist in their modern descendants, such as plants and invertebrates. These mechanisms include phagocytosis, antimicrobial peptides called defensins and the complement system. Leukopod vertebrates such as humans have even more sophisticated defence mechanisms, such as the ability to adapt over time to recognise certain pathogens more efficiently. Adaptive (or acquired) immunity creates an immunological memory after an initial response to a particular pathogen, leading to an enhanced response when the same pathogen is subsequently encountered. This process of acquired immunity is the basis of vaccination.

**Question 0**

The bacterial immune system contains enzymes that protect against infection by which cells?

**Question 1**

What is the name of the antimicrobial peptides that have evolved as an immune defence in eukaryotes?

**Question 2**

What is the medical basis for the idea of acquired immunity in leukopod vertebrates?

**Question 3**

What is the ability to identify and adapt to new specific pathogens?

**Question 4**

What is known for being slow to adapt and evolve?

**Question 5**

What is missing from simple single-celled organisms?

**Question 6**

What is an example of a less developed defence mechanism that jawed vertebrates have?

**Question 7**

What creates immunological memory before the initial reaction to the pathogen?

**Question 8**

What medical treatment is completely different from acquired immunity?

**Text number 48**

In humans, this response is activated when complement binds to antibodies attached to microbes or when complement proteins bind to carbohydrates on the microbial surface. This recognition signal triggers a rapid killing response. The speed of the response is due to signal amplification by sequential proteolytic activation of complement molecules, which are also proteases. Once initially bound to the microbe, complement proteins activate their protease activity, which in turn activates other complement proteases and so on. This creates a catalytic cascade that amplifies the initial signal through controlled positive feedback. The cascade results in peptides that attract immune cells, increase vascular permeability and opsonise (coat) the surface of the pathogen, marking it for destruction. This complement deposition can also kill cells directly by disrupting their plasma membrane.

**Question 0**

Complement proteins bind to which molecules on the surface of microbes to induce an immune response?

**Question 1**

What process results in the speed of the killing response of the human immune system?

**Question 2**

What kind of cascade is formed when complement proteins bind to microbes and activate their protease activity?

**Question 3**

How can the landing of a compliment directly kill invader cells?

**Question 4**

What is this plant-activated response?

**Question 5**

What triggers the slow kill response?

**Question 6**

Which has nothing to do with the speed of the response?

**Question 7**

What do complement proteins activate before they bind to the microbe?

**Question 8**

What rejects immune cells?

**Document number 468**

**Text number 0**

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental scientific body under the UN, set up at the request of member governments. It was established in 1988 by two United Nations agencies, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), and later adopted by the United Nations General Assembly in Resolution 43/53. Membership of the IPCC is open to all WMO and UNEP members. The IPCC produces reports in support of the United Nations Framework Convention on Climate Change (UNFCCC), the main international agreement on climate change. The ultimate objective of the UNFCCC is "to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The IPCC reports cover "the scientific, technical and socio-economic information relevant to understanding the scientific basis of the risk of anthropogenic climate change, its potential impacts and adaptation and mitigation options".

**Question 0**

Which organisation does the IPCC belong to?

**Question 1**

Which UN agencies established the IPCC?

**Question 2**

What does the UN want to stabilise?

**Question 3**

What is the UN climate change agreement?

**Question 4**

Which UN resolution adopted the IPCC?

**Question 5**

What is the US intergovernmental body?

**Question 6**

Which organisation was responsible for setting up the IPCC?

**Question 7**

Who refused to accept the IPCC?

**Question 8**

Which organisation can only certain members belong to?

**Question 9**

What is one of the smaller agreements on climate change?

**Text number 1**

Hoesung Lee, a Korean economist, has chaired the IPCC since 8 October 2015, when the new IPCC Bureau was elected. Prior to this election, the IPCC was chaired by his Vice-Chair, Ismail El Gizouli, who was appointed Acting Chair by Rajendra K. Pachauri in February 2015. The previous Chairmen were Mr Rajendra K. Pachauri, who was replaced by Mr Rajendra K. Pachauri when Mr Rajendra Pachauri resigned. Pachauri, who was elected in May 2002, Robert Watson in 1997 and Bert Bolin in 1988. The Chair is assisted by an elected Bureau, comprising Vice-Chairs, Working Group Co-Chairs and a Secretariat.

**Question 0**

Who is the chair of the IPCC?

**Question 1**

What nationality is Hoesung Lee?

**Question 2**

Who is the Vice-Chair of the IPCC?

**Question 3**

Who was the first chair of the IPCC?

**Question 4**

When did Pachauri step down as IPCC chair?

**Question 5**

Who is the chair of the IPCC?

**Question 6**

In which year did Hoesung Lee become president?

**Question 7**

Who was the chair of the IPCC before Hoesung Lee?

**Question 8**

What year did El Gizouli resign from the IPCC?

**Question 9**

Who was the first chair of the IPCC?

**Text number 2**

The IPCC Panel is made up of representatives appointed by governments and organisations. The participation of representatives with relevant expertise is encouraged. Plenary meetings of the IPCC and IPCC Working Groups will be held at governmental level. Non-governmental and intergovernmental organisations may participate as observers. IPCC Bureau sessions, workshops, expert and lead author meetings are by invitation only. 350 government officials and climate change experts attended the 2003 meeting. Opening ceremonies were followed by closed plenary sessions. According to the meeting report, 322 people attended the sessions, with about seven-eighths of the participants coming from governmental organisations.

**Question 0**

Who is on the IPCC panel?

**Question 1**

How many people attended the 2003 IPCC meeting?

**Question 2**

What kind of people attend IPCC meetings?

**Question 3**

How many of the participants in the IPCC are government representatives?

**Question 4**

Which NGOs participate in plenary sessions?

**Question 5**

Which IPCC sessions are open to all?

**Question 6**

What year did more than 375 officials attend the IPCC Bureau meeting?

**Question 7**

Which sessions were attended by the majority of NGOs?

**Question 8**

Which session did the IPCC Panel attend before the opening?

**Text number 3**

The IPCC is funded by the IPCC Fund, which was set up in 1989 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). WMO covers the living expenses of the Secretary and the Secretariat, while UNEP covers the costs of the Deputy Secretary. WMO, UNEP and IPCC members make annual cash contributions to the fund, which are set by the IPCC Panel, which is also responsible for considering and unanimously approving the annual budget. The Organization shall comply with the WMO Financial Rules and Regulations.

**Question 0**

When was the IPCC Fund established?

**Question 1**

Who set up the IPCC fund?

**Question 2**

Who will fund the IPCC Secretary?

**Question 3**

Who is funding the IPCC Deputy Secretary?

**Question 4**

What rules does the IPCC have to follow?

**Question 5**

Which foundation does the IPCC fund?

**Question 6**

Which organisation will cover the costs of the IPCC chair?

**Question 7**

When was UNEP established?

**Question 8**

Who will distribute the money from the annual fund?

**Question 9**

Who does not have to comply with financial rules and regulations?

**Text number 4**

The IPCC does not conduct research or monitor climate-related data. The lead authors of IPCC reports assess the available information on climate change based on published sources. IPCC guidelines state that authors should give priority to peer-reviewed sources. Authors may also refer to non-peer-reviewed sources ("grey literature") provided that they are of sufficient quality. Examples of non-peer-reviewed sources include model results, reports from government agencies and NGOs, and industry journals. Each subsequent IPCC report will identify areas where science has advanced since the previous report, including areas where further research is needed.

**Question 0**

What does the IPCC not do?

**Question 1**

Where do the IPCC reports get their information?

**Question 2**

What is "grey literature"?

**Question 3**

What kind of non-reviewed sources does the IPCC use?

**Question 4**

Who is responsible for monitoring climate data?

**Question 5**

Which organisation conducts climate-related research?

**Question 6**

What guidelines are used in IPCC assessments?

**Question 7**

What kind of research is required under the IPCC guidelines?

**Question 8**

What is an example of a peer-reviewed source?

**Text number 5**

Each chapter has several authors who are responsible for writing and editing the material. A chapter typically has two "coordinating lead authors", ten to fifteen "lead authors" and a slightly larger number of "contributing authors". The coordinating lead authors are responsible for bringing together the contributions of other authors, ensuring that they meet stylistic and formatting requirements, and reporting back to the working group chairs. The lead authors are responsible for writing the chapter sections. Contributing authors prepare text, diagrams or data for inclusion by the lead authors.

**Question 0**

How many coordinating lead authors are there in the IPCC report chapter?

**Question 1**

How many lead authors does the IPCC report figure have?

**Question 2**

How many authors are there in the IPCC report chapter?

**Question 3**

Who will collect the contributions of the authors?

**Question 4**

To whom do the coordinating editors-in-chief report?

**Question 5**

What is one editor-in-chief responsible for?

**Question 6**

How many chapters have a coordinating lead author?

**Question 7**

Who do the authors report to?

**Question 8**

Who is responsible for publishing the material?

**Question 9**

For whom do the editors-in-chief prepare the descriptors and data?

**Text number 6**

The executive summary of the Working Group I summary for policy makers states that they are confident that human emissions will significantly increase the concentration of greenhouse gases in the atmosphere, leading on average to further warming of the Earth's surface. They calculate with certainty that carbon dioxide is responsible for more than half of the increase in the greenhouse effect. They predict that in a "business as usual" (BAU) scenario, the average global temperature will rise by about 0.3°C per decade over the [21st] century. They estimate that the average global surface temperature has risen by 0.3-0.6°C over the last 100 years, broadly in line with climate model predictions but also on the same order of magnitude as natural climate variability. An unambiguous detection of an increased greenhouse effect is likely to take a decade or more.

**Question 0**

What does WG I's summary for policy makers say human activity contributes to greenhouse gases?

**Question 1**

What are the causes of the increase in greenhouse gases?

**Question 2**

How much of the greenhouse effect is caused by carbon dioxide?

**Question 3**

What is the scenario in which we do not change our greenhouse gas production practices?

**Question 4**

How much has the average surface temperature of the Earth changed over the last century?

**Question 5**

In summary, what human activity is responsible for global cooling?

**Question 6**

How much are CO2 concentrations expected to increase under the business-as-usual scenario?

**Question 7**

How much is carbon dioxide concentration expected to increase over the next 100 years?

**Question 8**

What climate models suggest will increase by up to 0.6 degrees Celsius over the next 100 years?

**Question 9**

When will the increased greenhouse effect reach alarming levels?

**Text number 7**

In 2001, 16 national academies of science issued a joint statement on climate change. The Australian Academy of Science, the Royal Belgian Academy of Flanders, the Royal Canadian Academy of Sciences, the Royal Canadian Academy of Sciences, the Royal Caribbean Academy of Sciences, the Chinese Academy of Sciences, the French Academy of Sciences, the Leopoldina German Academy of Sciences, the Royal Belgian Academy of Sciences and Arts, the Royal Canadian Academy of Sciences, the French Academy of Sciences and the Leopoldina German Academy of Sciences issued a joint statement, National Academy of Sciences of India, Indonesian Academy of Sciences, Royal Academy of Ireland, Accademia Nazionale dei Lincei (Italy), Malaysian Academy of Sciences, Royal Society Academy Council of New Zealand, Royal Swedish Academy of Sciences and Royal Society (United Kingdom). The statement, which was also published as an editorial in the journal Science, stated that "we support [the TAR's] conclusion that there is at least a 90% certainty that temperatures will continue to rise, with the average global surface temperature projected to rise by 1.4 to 5.8 degrees Celsius by 2100 from 1990 levels". The TAR has also been endorsed by the Canadian Foundation for Climate and Atmospheric Sciences, the Canadian Meteorological and Oceanographic Society and the European Geosciences Union (see "IPCC endorsements").

**Question 0**

When was the joint statement on climate change adopted?

**Question 1**

How many organisations issued a joint statement on climate change?

**Question 2**

In which newspaper was the joint statement published?

**Question 3**

How confident were the scientists, according to the statement, that temperatures would continue to rise?

**Question 4**

How much was the global surface temperature predicted to rise by 2100?

**Question 5**

What year did 12 national academies of science issue a joint statement on climate change?

**Question 6**

Which association was responsible for publishing the joint statement?

**Question 7**

In which newspaper were the facts about climate change published?

**Question 8**

Who concluded that CO2 levels would rise by 90%?

**Question 9**

In which year is the average CO2 concentration expected to increase by 90%?

**Text number 8**

Richard Lindzen, author of the IPCC, has made several criticisms of the TAR. Among other things, Lindzen has argued that the WGI Summary for Policymakers (SPM) is not a faithful summary of the full WGI report. For example, Lindzen notes that the summary underestimates the uncertainty associated with climate models. John Houghton, co-chair of the TAR WGI, has responded to Lindzen's criticism of the SPM. Mr Houghton has stressed that the SPM has been agreed by several world governments and that scientific evidence is needed to support changes to the SPM.

**Question 0**

Which IPCC author criticised the TAR?

**Question 1**

What is Lindzen criticising in his summary for policy makers?

**Question 2**

Who responded to Lindzen's criticism?

**Question 3**

What was Houghton's role?

**Question 4**

What did Houghton say it would take to change the SPM?

**Question 5**

Which organisation faithfully summarised the WGI report?

**Question 6**

Who is one of the authors of the WGI summary?

**Question 7**

Who has said that climate models are uncertain?

**Question 8**

Which organisation's representatives have disagreements with the SPM?

**Question 9**

What changes is there scientific evidence for?

**Text number 9**

In addition to climate assessment reports, the IPCC publishes special reports on specific topics. All IPCC Special Reports follow the same preparation and approval process as the IPCC Assessment Reports. In 2011, two IPCC Special Reports were finalised, the Special Report on Renewable Energy and Climate Change Mitigation (SRREN) and the Special Report on Managing the Risks of Extreme Events and Disasters to Adapt to Climate Change (SREX). Both special reports were requested by governments.

**Question 0**

How does the IPCC produce special reports?

**Question 1**

When was the Special Report on Renewable Energy and Climate Change (SRREN) published?

**Question 2**

When was the Special Report on managing the risks of extreme events and disasters to promote adaptation to climate change (SREX) published?

**Question 3**

Why were the 2011 Special Reports drawn up?

**Question 4**

Which organisation is responsible for producing only climate assessment reports?

**Question 5**

Which reports follow a different procedure from the evaluation reports?

**Question 6**

In what year were two evaluation reports completed?

**Question 7**

Which is the second of the two evaluation reports published in 2011?

**Question 8**

Which 2011 report did the IPCC request?

**Text number 10**

The IPCC will focus its activities on the tasks assigned to it by resolutions and decisions of the WMO Executive Council and the UNEP Governing Council, and on activities in support of the UNFCCC process. The preparation of assessment reports is one of the IPCC's main tasks, but it also supports other activities required by the UNFCCC, such as the Clearing House and the National Greenhouse Gas Inventory Programme. This includes the publication of default emission factors, i.e. the factors used to derive emission estimates based on fuel consumption, industrial production and similar levels.

**Question 0**

What other actions does the UNFCCC require the IPCC to take?

**Question 1**

What is used to estimate emissions?

**Question 2**

Which tiers of things are used to determine emission factors?

**Question 3**

Which councils give tasks to the IPCC?

**Question 4**

Who heads the UNEP Council?

**Question 5**

Which organisation is supported by the UNFCCC processes?

**Question 6**

What is one of the IPCC's minor tasks?

**Question 7**

Who is responsible for implementing the national greenhouse gas inventory programme?

**Question 8**

How do you measure fuel consumption?

**Text number 11**

This forecast was not included in the final summary for policy makers. The IPCC has since acknowledged that the date was incorrect, while confirming that the conclusion of the final summary was robust. It regretted that the IPCC's established procedures were poorly applied in this case. The IPCC has correctly quoted 2035 from the WWF report, which has misquoted its own source, the ICSI report 'Variations of Snow and Ice in the past and at present on a Global and Regional Scale'.

**Question 0**

What did the IPCC say was a mistake?

**Question 1**

What did the IPCC apologise for?

**Question 2**

What caused the error?

**Question 3**

Which report had the correct date?

**Question 4**

What date was confirmed by the IPCC?

**Question 5**

What did policy makers create for the IPCC?

**Question 6**

Who received the forecast included in the final summary?

**Question 7**

What was the title of the WWF report?

**Text number 12**

Robert Watson, former chair of the IPCC, has said that "all the mistakes seem to have gone in the direction of making climate change look more serious by exaggerating its effects. This is worrying. The IPCC needs to look at this trend of errors and ask why this has happened". Climate expert Martin Parry, who chaired IPCC Working Group II, said that "what started with one unfortunate error about Himalayan glaciers has turned into a shouting match without substance" and that the IPCC had examined other alleged errors, which were "generally unfounded and also marginal to the assessment".

**Question 0**

What was Robert Watson's role in the IPCC?

**Question 1**

Which way did Watson say the mistake went?

**Question 2**

What was Martin Parry's role in the IPCC?

**Question 3**

What was the subject of the error?

**Question 4**

What was the verdict on the other alleged errors?

**Question 5**

Who said climate change has been exaggerated?

**Question 6**

Who should be concerned that the effects of climate change are being downplayed?

**Question 7**

Who published the error about the Himalayan glaciers?

**Question 8**

What major error called into question the IPCC study?

**Question 9**

Who carried out the assessments where significant errors were found?

**Text number 13**

The Third Assessment Report (TAR) prominently featured a graph entitled "Reconstruction of the Northern Hemisphere Temperature at the Turn of the Millennium", based on a 1999 publication by Michael E. Mann, Raymond S. Bradley and Malcolm K. Hughes (MBH99), which has been called the "hockey stick graph". This graph extended a similar graph shown in Figure 3.20 of the IPCC's 1995 Second Assessment Report, and differed from the graph in the First Assessment Report, which lacked temperature units but appeared to show greater global temperature variability over the past 1000 years and higher temperatures in the Medieval Warm Period than in the mid-20th century. The graph was not an actual data graph, but was based on a graph of temperatures in central England, where temperatures had been raised based on documents relating to medieval vineyards in England. Despite this uplift, the medieval maximum temperature it showed did not match the temperatures recorded in central England in 2007. The finding of MBH99 was supported by Jones et al. 1998, Pollack, Huang & Shen 1998, Crowley & Lowery 2000 and Briffa 2000, who used different data and methods. The Jones and Briffa reconstructions were overlaid on the MBH99 reconstruction in Figure 2.21 of the IPCC report.

**Question 0**

When was the article published on which the "Northern Hemisphere temperature reconstruction at the turn of the millennium" graph was based?

**Question 1**

Who wrote the article on which the "Millennium Northern Hemisphere temperature reconstruction" graph was based?

**Question 2**

What is the nickname of the "Northern Hemisphere temperature reconstruction at the turn of the millennium"?

**Question 3**

Which reconstructions supported the information in the 1999 document?

**Question 4**

Which descriptor featured prominently in the second evaluation report?

**Question 5**

In what year was the third evaluation report published?

**Question 6**

What was missing from the second evaluation report?

**Question 7**

In which report were the temperature fluctuations less pronounced?

**Question 8**

Which area was the 1995 report based on?

**Text number 14**

These studies were widely presented as evidence that the current warming period is exceptional compared to the temperatures between 1000 and 1900, and a graph based on MBH99 was made public. Even at the draft stage, opponents disputed this finding: in May 2000, Fred Singer's Science and Environmental Policy Project held a press conference on Capitol Hill in Washington, D.C., where comments on the graph were presented. Wibjörn Karlén and Singer objected to the graph at a Senate Commerce, Science and Transportation Committee hearing on July 18, 2000. John Lawrence Daly, representing the opposing position, presented an amended version of the IPCC's 1990 graph, which he felt appeared incorrectly in the IPCC's 1995 report, and argued that "the IPCC reversed its own earlier view in the 1995 report and presented the "Hockey Stick" as a new orthodoxy, with little apology or explanation for the sharp reversal after the 1995 report." The Bush administration seized on criticism of the MBH99 reconstruction in a review paper and quickly discredited it in the Soon-Baliunas controversy. The Bush administration seized on the criticism, with US Republican Senator James Inhofe claiming in his Senate speech that 'man-made global warming is the biggest hoax ever perpetrated on the American people'. The data and methods used to produce the pie chart were criticised in the publications of Stephen McIntyre and Ross McKitrick, and the criticisms of these publications were in turn examined in other studies and comprehensively refuted in Wahl & Ammann (2007), which showed flaws in the methods used by McIntyre and McKitrick.

**Question 0**

To which years was the current warming compared?

**Question 1**

Who led the science and environment policy project?

**Question 2**

Where did Singer hold a press conference in May 2000?

**Question 3**

When did Singer deny the graph at the Senate hearing?

**Question 4**

Which Senate committee did Singer address in July 2000?

**Question 5**

Which years of warming did the studies show were exceptional?

**Question 6**

Who was in favour of including a graph in the final report?

**Question 7**

What did Karlen and Singer present to the US Senate?

**Question 8**

On what day did John Lawrence Daly present the 1995 IPCC report?

**Question 9**

Which photographer was supported by McIntyre and McKitrick?

**Text number 15**

On June 23, 2005, House Energy and Commerce Committee Chairman Joe Barton and Oversight and Investigations Committee Chairman Ed Whitfield wrote joint letters demanding that Mann, Bradley and Hughes provide complete information on climate research and personal details of their finances and careers. House of Representatives Science Committee Chairman Sherwood Boehlert said it was a "misleading and illegal investigation" apparently designed to intimidate scientists, and at his request the US National Academy of Sciences organised a special investigation by its National Research Council. The National Research Council report acknowledged that there were statistical flaws, but they had little impact on the graph, which was generally correct. In a 2006 letter to Nature, Mann, Bradley and Hughes pointed out that their original article had stated that "more extensive high-resolution data are needed before more confident conclusions can be drawn" and that the uncertainties were "at the heart of the article".

**Question 0**

Who was the chairman of the House of Representatives Committee on Energy and Commerce?

**Question 1**

Who was the chairman of the Committee of Control and Investigation?

**Question 2**

When will Barton and Whitfield demand climate research papers?

**Question 3**

Who was the chairman of the House of Representatives Science Committee?

**Question 4**

Who said Barton's study was "misleading and illegal"?

**Question 5**

To whom did Representative Joe Barton write a letter?

**Question 6**

Who kept the full details of the climate study?

**Question 7**

Who claimed that the survey was legal?

**Question 8**

Who were the scientists afraid of?

**Question 9**

Which Council survey found no statistical deficiencies?

**Text number 16**

The IPCC Fourth Assessment Report (AR4) published in 2007 presented a chart showing 12 proxy-based temperature reconstructions, including three highlighted in the 2001 Third Assessment Report (TAR); Mann, Bradley & Hughes 1999, as previously, Jones et al. 1998 and Briffa 2000, both calibrated with more recent studies. In addition, the analysis of the Medieval Warm Period referred to reconstructions by Crowley & Lowery 2000 (as in TAR) and Osborn & Briffa 2006. Ten of these 14 reconstructions covered 1000 years or more. Most of the reconstructions used some common data sets, particularly tree-ring data, but the more recent reconstructions used additional data and covered a wider area using different statistical methods. The divergence problem affecting some of the tree-ring data was discussed.

**Question 0**

When was the IPCC Fourth Assessment Report published?

**Question 1**

When was the IPCC Third Assessment Report published?

**Question 2**

How many reconstructions of the Medieval Warm Period were used?

**Question 3**

How many reconstructions of the Medieval Warm Period covered more than 1 000 years?

**Question 4**

What was the problem with some of the tree ring files?

**Question 5**

Which report excluded the temperature reconstruction graph?

**Question 6**

How many temperature constructs were included in the second evaluation report?

**Question 7**

Who calibrates the newer surveys?

**Question 8**

Who analysed the medieval cold period?

**Question 9**

How many reconstructions covered more than 10 000 years?

**Text number 17**

On 1 February 2007, on the eve of the publication of the IPCC's major climate report, a study was published showing that temperature and sea level have risen at or above the maximum rate proposed in the IPCC's previous report, published in 2001. The study compared the IPCC's 2001 projections of temperature and sea level change with observations. For the six years studied, the actual temperature increase was close to the upper limit of the range of the IPCC 2001 projection, and the actual sea level rise was above the upper limit of the IPCC projection range.

**Question 0**

When was the study published that confirmed the IPCC's 2001 projections?

**Question 1**

How did the 2001 IPCC report reflect reality between 2001 and 2006?

**Question 2**

How did the 2001 IPCC report reflect reality in terms of temperatures?

**Question 3**

How did the IPCC's 2001 report on sea level correspond to reality?

**Question 4**

What had declined according to the IPCC 2007 report?

**Question 5**

How many years of temperatures were examined in the 2001 report?

**Question 6**

Which predictions showed that temperatures would rise but sea levels would fall?

**Question 7**

Which forecast exaggerated the rate of temperature increase?

**Question 8**

Below what level was sea level in the IPCC 2001 projection?

**Text number 18**

Another example of a scientific study that shows that the IPCC's previous assessments have not exaggerated the dangers and risks, but have in fact underestimated them, is the study on projected sea-level rise. When the researchers' analysis was "applied to possible scenarios put forward by the Intergovernmental Panel on Climate Change (IPCC), they found that by 2100, sea levels would be 0.5-1.4 metres [50-140 cm] higher than 1990 levels. These values are much higher than the 9-88 cm predicted by the IPCC in its Third Assessment Report published in 2001". This may have been partly due to the increasing human understanding of climate.

**Question 0**

What risk is the IPCC underestimating?

**Question 1**

How much will sea levels rise between 1990 and 2100 according to the IPCC's Third Assessment Report?

**Question 2**

How much do scientists expect sea levels to rise between 1990 and 2100?

**Question 3**

When was the third evaluation report published?

**Question 4**

How much higher was sea level in 1990 than in 2100?

**Question 5**

What was the projected sea level rise in the Fourth Assessment Report?

**Question 6**

Who predicted the 1990 levels in the Third Assessment Report?

**Question 7**

What research suggests that previous estimates were exaggerated?

**Question 8**

How much lower do scientists expect sea levels to be in 2100 compared to 1990?

**Text number 19**

Michael Oppenheimer, a long-time IPCC contributor and coordinating lead author of the Fifth Assessment Report, acknowledged some of the limitations of the IPCC's consensus approach in Science Magazine's State of the Planet 2008-2009, and called for smaller, specific problem assessments to replace the broad approach of previous IPCC assessment reports. A broader consideration of uncertainties has become increasingly important. Others see the IPCC process as contradictory in its quest for consensus and call for the inclusion of dissenting or minority views or improved statements on uncertainties.

**Question 0**

What role did Michael Oppenheimer play in the IPCC reports?

**Question 1**

Who published the State of the Planet 2008-2009 report?

**Question 2**

What approach did Oppenheimer advocate?

**Question 3**

Who was the author of the fourth evaluation report?

**Question 4**

When was the fifth evaluation report produced?

**Question 5**

Which reports did Michael Oppenheimer suggest should include a comprehensive assurance study?

**Question 6**

Where will dissenting opinions be published?

**Question 7**

In which journal did Oppenheimer defend the consensus approach?

**Text number 20**

The IPCC climate change process and its effectiveness and success have been compared with other environmental challenges (cf. ozone depletion and global warming). For ozone depletion, global regulation under the Montreal Protocol has been successful, but for climate change the Kyoto Protocol failed. The ozone case was used to assess the effectiveness of the IPCC process. The IPCC has reached a broad scientific consensus, while countries and governments continue to pursue different, if not opposing, objectives. The linear model underlying policy-making, whereby the more information we have, the better the policy response, has been challenged.

**Question 0**

What has been done to combat ozone depletion?

**Question 1**

What was the Kyoto Protocol trying to solve?

**Question 2**

Whose objectives does the IPCC still often oppose?

**Question 3**

The Kyoto Protocol dealt with what impoverishment?

**Question 4**

What is the process followed by both science and governments?

**Question 5**

What are the common objectives of science and government?

**Question 6**

With whom do states and governments often work along the same lines?

**Question 7**

What is ensured by the political reaction to the linear model?

**Text number 21**

Sheldon Ungar's comparison with global warming shows that in the case of ozone depletion, the actors were more aware of scientific ignorance and uncertainty. The ozone case was communicated to the lay public with "easily understood bridging metaphors from popular culture" and related to "immediate risks that have everyday relevance", whereas public opinion on climate change sees no immediate danger. The gradual mitigation of the ozone layer challenge was also based on the successful reduction of regional burden-sharing conflicts. Due to the conclusions of the IPCC and the failure of the Kyoto Protocol, various regional cost-benefit analyses and burden-sharing conflicts over the distribution of emission reductions remain an unresolved problem. In the UK, a report to a House of Lords committee asked the IPCC to make better estimates of the costs and benefits of climate change, but the Stern Review, commissioned by the UK government, made a stronger case for tackling man-made climate change.

**Question 0**

Who said that people involved in the ozone situation have a "better understanding of scientific ignorance and uncertainties"?

**Question 1**

What are the outstanding problems with the Kyoto Protocol?

**Question 2**

What conflicts did ozone reduction reduce?

**Question 3**

Who subscribed to the Stern Review?

**Question 4**

Who has argued that scientific ignorance is the cause of the uncertainties surrounding global warming?

**Question 5**

Which metaphors explained global warming?

**Question 6**

What does everyday life have to do with popular culture?

**Question 7**

What does the public see as an immediate danger?

**Question 8**

What was one of the problems solved by the Kyoto Protocol?

**Text number 22**

As the IPCC does not carry out its own research, it works on the basis of scientific publications and independently documented results from other scientific bodies, and its reporting timetable requires a deadline for submission of the report before final publication. In principle, this means that any significant new evidence or events that change our understanding of climate science between this deadline and the publication of the IPCC report cannot be taken into account. In a discipline where our scientific understanding is changing rapidly, this has been seen as a serious shortcoming in a body widely regarded as the supreme authority on science. However, key findings and levels of scientific confidence have generally evolved steadily from one evaluation report to the next.

**Question 0**

What does the IPCC rely on for its studies?

**Question 1**

What can be left out because of the deadlines in the IPCC report?

**Question 2**

Who is considered the final authority on climate change?

**Question 3**

Which organisation is responsible for its own research?

**Question 4**

Who benefits from the IPCC study?

**Question 5**

In which discipline is understanding slow to change?

**Question 6**

What is the problem with the report that lacks scientific confidence?

**Text number 23**

In February 2010, in response to controversy over claims in the Fourth Assessment Report, five climate scientists - all authors of the IPCC report or lead authors of the IPCC report - wrote in Nature calling for changes to the IPCC. They proposed several new organisational options, such as tightening the selection of lead authors and contributors, abandoning the IPCC in favour of a small permanent body, or even turning the entire climate science assessment process into a moderated "live" Wikipedia IPCC. Other recommendations included that the panel hire full-time staff and remove government oversight of its processes to avoid political interference.

**Question 0**

How many scientists called for a change in the IPCC in February 2010?

**Question 1**

Where was the request for change published in February 2010?

**Question 2**

What was one suggestion that could help the IPCC respond more quickly to new evidence?

**Question 3**

How was the IPCC proposed to avoid political problems?

**Question 4**

When was the fourth evaluation report published?

**Question 5**

In which journal did five leading IPCC authors call for support for the IPCC?

**Question 6**

Who called for more government oversight of the IPCC?

**Question 7**

What did the IPCC complain about government oversight?

**Question 8**

What is one way in which the current IPCC reacts quickly to new evidence?

**Document number 469**

**Text number 0**

A prime (or prime number) is a natural number greater than 1 that has no positive divisors other than 1 and itself. A natural number greater than 1 that is not a prime is called a composite number. For example, 5 is a prime number because 1 and 5 are its only positive integer factors, while 6 is a composite number because it has, in addition to 1 and 6, divisors 2 and 3. The fundamental theory of arithmetic confirms the centrality of prime numbers in number theory: all integers greater than 1 can be expressed as the product of prime numbers, which is unique up to order. The uniqueness of this theorem requires that 1 be omitted as a prime number, since any multiplication can include an arbitrary number of instances of 1, e.g. 3, 1 - 3, 1 - 1 - 3, etc. are all valid multiplications of 3.

**Question 0**

What is the only divisor that a prime number can have in addition to 1?

**Question 1**

What are numbers greater than 1 that can be divided by three or more?

**Question 2**

Which theorem defines the main role of prime numbers in number theory?

**Question 3**

Any number greater than 1 can be represented as the product of which?

**Question 4**

Why must one be excluded in order to preserve the uniqueness of a fundamental proposition?

**Question 5**

What is the only divisor a product can have in addition to 1?

**Question 6**

What are numbers greater than 1 that can be divided by six or more?

**Question 7**

Any number greater than 6 can be used to represent?

**Question 8**

A number greater than -3 can be represented as the product of which?

**Question 9**

Why must -1 be omitted in order to preserve the uniqueness of a fundamental proposition?

**Text number 1**

The property of being a prime (or not being) is called a prime. A simple but slow method for checking the prime of a given number n is known as trial division. It tests whether n is a multiple of any integer between 2 and . Much more efficient algorithms than trial division have been developed for testing the prime of large numbers. These include the Miller-Rabin prime test, which is fast but has a low probability of error, and the AKS prime test, which always gives the correct answer in polynomial time but is too slow to be practical. Particularly fast methods are available for special shaped numbers, such as Mersenne numbers. As of January 2016[update], the largest known prime number has 22 338 618 decimal digits.

**Question 0**

What is the name of the property that determines whether a number is a prime number or not?

**Question 1**

What is the name of the process that confirms the prime of the number n?

**Question 2**

What is the name of one algorithm that can be used to conveniently test the prime numbers of large numbers?

**Question 3**

What is the name of another algorithm that can be used to conveniently test the prime numbers of large numbers?

**Question 4**

How many digits does the largest known prime consist of in January 2016?

**Question 5**

What is the name of the property that determines whether a number is effective or not?

**Question 6**

What is the name of the process that validates the prime of a decimal number?

**Question 7**

What is the name of one algorithm that can be used to conveniently test the prime numbers of decimal numbers?

**Question 8**

What is the name of another algorithm that can be used to conveniently test the prime numbers of decimal numbers?

**Question 9**

How many prime numbers does the largest known prime number consist of in January 2016?

**Text number 2**

There are infinitely many prime numbers, as Euclid showed around 300 BC. No simple formula is known to separate prime numbers from compound numbers. However, it is possible to model the distribution of primes, i.e. the statistical behaviour of primes in large numbers. The first result in this direction is the prime number theorem, proved in the late 19th century, according to which the probability that a given, randomly chosen number n is a prime is inversely proportional to the number of its digits, or the logarithm of n.

**Question 0**

How many prime numbers are there?

**Question 1**

Who determined the number of existing prime numbers?

**Question 2**

What kind of behaviour can be identified in the early stages?

**Question 3**

According to which theorem is the probability that n is prime inversely proportional to its logarithm?

**Question 4**

When was the prime number theorem proved?

**Question 5**

How many dialled numbers are there?

**Question 6**

Who determined the number of existing dialled numbers?

**Question 7**

What kind of behaviour in chosens can be determined?

**Question 8**

By which theorem does the probability that n is prime inversely proportional to its direction?

**Question 9**

When was the random number theorem proved?

**Text number 3**

Many questions about prime numbers are still open, such as Goldbach's conjecture (that every even integer greater than 2 can be expressed as the sum of two prime numbers) and the double prime conjecture (that there are infinitely many pairs of prime numbers whose difference is 2). Such questions spurred the development of various branches of number theory that focus on analytic or algebraic aspects of numbers. Primes are used in many routines in computer science, such as public key cryptography, which exploits properties such as the difficulty of decomposing large numbers into their primes. Prime numbers lead to various generalizations in other areas of mathematics, mainly algebra, such as elementary numbers and prime ideals.

**Question 0**

What is the name of the assumption that all numbers greater than 2 can be represented as the sum of two prime numbers?

**Question 1**

What is the name of the hypothesis that there is an infinite number of pairs of prime numbers whose difference is 2?

**Question 2**

What other property of numbers does number theory focus on besides the analytic property of numbers?

**Question 3**

What is a prime number application in computing that takes advantage of the fact that factoring very large prime numbers is very challenging?

**Question 4**

What is the name of an algebraic generalisation inspired by prime numbers?

**Question 5**

What is the name of the assumption that any number greater than one can be represented as the sum of two prime numbers?

**Question 6**

What is the name of the assumption that there is an infinite number of pairs of prime numbers whose difference is a prime number?

**Question 7**

What other analytic property of Goldbach's conjecture does number theory focus on in addition to the analytic property of Goldbach's conjecture?

**Question 8**

What is an application of prime numbers in computing that takes advantage of the fact that the factoring of very large prime numbers is expressed as the sum of two prime numbers?

**Question 9**

What is the name of one algebraic generalisation that Goldbach's conjecture has led to?

**Text number 4**

Therefore, 6 is not a prime number. The figure on the right shows that 12 is not a prime: 12 = 3 - 4. Any even number greater than 2 is not a prime because, by definition, such a number n has at least three distinct divisors, namely 1, 2 and n. It follows that n is not a prime. Similarly, in the ordinary decimal system, all prime numbers greater than 5 end in 1, 3, 7 or 9 because even numbers are multiples of 2 and numbers ending in 0 or 5 are multiples of 5.

**Question 0**

Any even number greater than what cannot be considered a prime number?

**Question 1**

What are the special divisors of all even numbers greater than 2?

**Question 2**

What name is given to all prime numbers greater than 2?

**Question 3**

In addition to 1, 3 and 7, what other number must all prime numbers above 5 end in?

**Question 4**

What type of numbers are always multiples of 2?

**Question 5**

Any even number greater than which cannot be considered distinct?

**Question 6**

What are the special divisors of all even numbers greater than 1?

**Question 7**

What name is given to any prime number greater than 1?

**Question 8**

What number other than 1, 3 and 7 must all the different divisors greater than 5 end up in?

**Question 9**

What type of numbers are always multiples of distinct divisors?

**Text number 5**

Most early Greeks did not even consider the number 1 to be a number, so they could not have considered it a prime number. In the Middle Ages and the Renaissance, many mathematicians considered 1 to be the first prime number. In the mid-19th century, Christian Goldbach mentioned 1 as the first prime number in his famous correspondence with Leonhard Euler, who disagreed. Even in the 19th century, many mathematicians still considered 1 to be a prime number. For example, Derrick Norman Lehmer's list of prime numbers up to 10 006 721, republished as late as 1956, began with 1 as the first prime number. Henri Lebesgue is said to have been the last professional mathematician to call the number 1 a prime number. By the early 20th century, mathematicians began to accept that 1 was not a prime number, but formed its own special category as a 'unit'.

**Question 0**

What number did the early Greeks not consider to be the correct number?

**Question 1**

Who defined 1 as the first prime number in the mid-1700s?

**Question 2**

In the mid-1700s, who didn't agree that 1 was the first prime number?

**Question 3**

How many prime numbers were included in Derrick Norman Lehmer's list of prime numbers?

**Question 4**

What type of number do modern mathematicians consider 1 to be?

**Question 5**

What number did Henri Lebesgue not consider to be the right number?

**Question 6**

Who included 1 as the first prime number in the mid-20th century?

**Question 7**

In the mid-20th century, who didn't think that 1 was the first prime number?

**Question 8**

How many prime numbers were included in the list of early Greek prime numbers?

**Question 9**

What did the early Greeks consider to be the number 1?

**Text number 6**

Much of the mathematical work would still be valid if 1 were called a prime number, but Euclid's basic arithmetic theory (mentioned above) would not be valid, as has been pointed out. For example, the number 15 can be factored as 3 - 5 and 1 - 3 - 5; if 1 were accepted as a prime, these two representations would be considered different factorizations of 15 as prime, so the statement in that theorem would have to be modified. Similarly, the Eratostenes sieve would not work correctly if 1 were taken as prime: a modified version of the sieve that took 1 as prime would remove all the multiples of 1 (i.e. all other numbers) and produce only one number 1. In addition, prime numbers have several properties that 1 lacks, such as its relationship to the corresponding value of the Euler totient function or the sum of divisors function.

**Question 0**

Which theorem would be invalid if the number 1 were taken as a prime number?

**Question 1**

Wouldn't the sieve of resignation be valid if what were true?

**Question 2**

What is one function that prime numbers have but 1 does not?

**Question 3**

What is another function on prime numbers that 1 does not have?

**Question 4**

If 1 were taken as the prime number, what would Eratosthenes' sieve give to all the other numbers?

**Question 5**

Which theorem would be invalid if the number 15 were taken as a prime number?

**Question 6**

Wouldn't Euler's sieve be valid if what were true?

**Question 7**

What is one function that prime numbers have but 15 do not?

**Question 8**

What is another function on prime numbers that 15 does not have?

**Question 9**

If 15 were taken as a prime number, what would the Eratosthenes' sieve give to all the other numbers?

**Text number 7**

The surviving records of the ancient Egyptians suggest that they had some knowledge of prime numbers: for example, the Egyptian fraction expansions in the Rhind papyrus have quite different forms for prime and composite numbers. However, the earliest surviving records of the explicit study of prime numbers come from the ancient Greeks. Euclid's Primes (c. 300 BC) contains important statements about prime numbers, such as the infinity of prime numbers and the basic arithmetic. Euclid also showed how to construct a complete number from Mersenne's prime number. The Eratosthenes sieve, dedicated to Eratosthenes, is a simple method for calculating prime numbers, although large prime numbers found on computers today have not been generated in this way.

**Question 0**

What is the name of the Egyptian papyrus that suggests they might have known prime numbers?

**Question 1**

Which civilisation was the first to be clearly known to have studied prime numbers?

**Question 2**

Which work published around 300 BC contains important theorems about prime numbers?

**Question 3**

Who showed how to obtain a perfect number from Mersenne's prime number?

**Question 4**

What does the Eratostenes sieve do?

**Question 5**

What is the name of the Egyptian papyrus that suggests they could know infinite numbers?

**Question 6**

Which civilisation was the first that is clearly known to have explored infinite numbers?

**Question 7**

Which work from around 3000 BC contains important theorems about infinite numbers?

**Question 8**

Who showed how to create an infinite number from Mersenne's prime number?

**Question 9**

What does a Euclidean sieve do?

**Text number 8**

After the Greeks, not much happened in the study of prime numbers before the 1600s. In 1640, Pierre de Fermat proposed (without proof) Fermat's Little Theorem (later proved by Leibniz and Euler). Fermat also conjectured that all numbers of the form 22n + 1 are prime numbers (called Fermat numbers), and proved this up to n = 4 (or 216 + 1). However, the immediately following Fermat number 232 + 1 is compound (one of its prime factors is 641), as Euler later discovered, and in fact no other Fermat number is known to be prime. The French monk Marin Mersenne considered prime numbers in the form 2p - 1, where p is a prime number. They are called Mersenne prime numbers in his honour.

**Question 0**

In what year did Pierre de Fermat proclaim Fermat's Little Theorem?

**Question 1**

Apart from Leibniz, which other mathematician proved Fermat's theorem?

**Question 2**

What shape are Fermat numbers?

**Question 3**

To what extent did Fermat confirm the validity of Fermat numbers?

**Question 4**

What is the shape of Mersenne's prime numbers?

**Question 5**

In what year did Pierre de Fermat declare Euler's Little Theorem?

**Question 6**

Apart from Beibniz, which other mathematician proved the validity of Euler's Little Theorem?

**Question 7**

What shape are Euler's numbers?

**Question 8**

To what extent did Fermat confirm the validity of Euler's numbers?

**Question 9**

What shape are Euler's prime numbers?

**Text number 9**

The basic method of checking the prime of a given integer n is called trial division. This routine consists of dividing n by each integer m that is greater than 1 and less than or equal to the square root of n. If the result of any such division is an integer, n is not prime, otherwise it is prime. In fact, if there is a composite (where a and b ≠ 1), one of the factors a or b is necessarily at most . For example, in the case of , the coefficients are m = 2, 3, 4, 5, and 6. None of these numbers divides 37, so 37 is prime. This routine can be performed more efficiently if a complete list of prime numbers up to the prime numbers is known - then the test distributions need only be checked for those m that are prime numbers. For example, to check the prime of 37, only three divisors (m = 2, 3 and 5) are needed, given that the numbers 4 and 6 are combined.

**Question 0**

What is the most elementary way to test the prime of an integer n?

**Question 1**

What makes the trial division method more efficient?

**Question 2**

In an experimental division, n is divided by any integer m greater than what?

**Question 3**

What must the integer m be less than or equal to when performing a division test?

**Question 4**

How many fractions are needed to prove the prime of 37?

**Question 5**

What is the most basic way to test the primitiveness of any distribution?

**Question 6**

What makes the prime number method more efficient?

**Question 7**

In an experimental division calculation, n is divided by any integer m that is less than what?

**Question 8**

What must the integer m be greater than or equal to when performing a division test?

**Question 9**

How many division calculations are needed to check the division of 37?

**Text number 10**

Modern primality tests for general numbers n can be divided into two main categories, probabilistic (or "Monte Carlo") and deterministic algorithms. Deterministic algorithms provide a way to tell for sure whether a given number is prime or not. For example, a trial division is a deterministic algorithm because, if executed correctly, it always identifies a prime number as prime and a composite number as composite. Probabilistic algorithms are generally faster, but they do not fully prove that a number is a prime number. These tests are based on testing a given number in a semi-random way. For example, a particular test might pass all the time if applied to a prime number, but only pass with probability p if applied to a composite number. If we repeat the test n times and pass it every time, the probability that our number is a compound number is 1/(1-p)n, which decreases exponentially with the number of tests, so we can be as sure as we like (though never absolutely sure) that the number is a prime number. On the other hand, if the test never fails, we know that the number is a composite.

**Question 0**

How many modern primary tests for the general numbers n exist?

**Question 1**

What is the name of a modern test of primitiveness?

**Question 2**

What is the name of another modern primary test?

**Question 3**

What type of algorithm is a test distribution?

**Question 4**

When using a probabilistic algorithm, how is the probability that a number is composite expressed mathematically?

**Question 5**

How many modern algorithm tests for the general numbers n exist?

**Question 6**

What is the name of a modern algorithm test?

**Question 7**

What is the name of another modern algorithm test?

**Question 8**

What kind of algorithm is a probability distribution?

**Question 9**

When using a probalistic prime number, how is the probability that the number is composite expressed mathematically?

**Text number 11**

A particularly simple example of a probability test is Fermat's primality test, which is based on the fact (Fermat's Little Theorem) that np≡n (mod p) for any n if p is a prime. If we have a number b whose prime we want to test, we compute the test to be nb (mod b) for a random value of n. The weakness of this test is that there are some compound numbers (Carmichael numbers) that satisfy Fermat identity even though they are not prime numbers, so the test cannot distinguish between prime numbers and Carmichael numbers. However, Carmichael numbers are much rarer than prime numbers, so this test may be useful for practical purposes. More powerful extensions of Fermat's primality test, such as the Baillie-PSW, Miller-Rabin and Solovay-Strassen tests, are guaranteed to fail at least some of the time when applied to compound numbers.

**Question 0**

What is one straightforward probability test case?

**Question 1**

What does Fermat's prime number test depend on?

**Question 2**

What types of numbers show that Fermat's primal test is wrong?

**Question 3**

What is the name of an impressive extension of Fermat's prime number test?

**Question 4**

What is the name of the second compelling extension of Fermat's test of primitiveness?

**Question 5**

What is one straightforward case of the Carmichael test?

**Question 6**

What does the Carmichael primality test depend on?

**Question 7**

What types of numbers show the Carmichael primality test to be incorrect?

**Question 8**

What is the name of one impressive Carmichael primary test extension?

**Question 9**

What is the name of the compelling sequel to the second Carmichael primary test?

**Text number 12**

are prime numbers. Prime numbers of this form are called factorial prime numbers. Other prime numbers where either p + 1 or p - 1 has a particular shape are Sophie Germain prime numbers (prime numbers of the form 2p + 1 where p is a prime), primordial prime numbers, Fermat prime numbers and Mersenne prime numbers, i.e. prime numbers of the form 2p - 1 where p is an arbitrary prime. The Lucas-Lehmer test is particularly fast for numbers of this form. This is why the largest known prime has almost always been the Mersenne prime since the beginning of electronic computers.

**Question 0**

What is the shape of Sophie Germain's prime numbers?

**Question 1**

What is the shape of Mersenne's prime numbers?

**Question 2**

Which test is particularly useful for numbers of the form 2p - 1?

**Question 3**

What is the name of a prime type where p+1 or p-1 takes a certain form?

**Question 4**

What is the name of another kind of prime where p+1 or p-1 has a particular shape?

**Question 5**

What shape are Sophie Germain's tests?

**Question 6**

What is the format of the Mersenne tests?

**Question 7**

Which test is particularly useful for tests with a 2p-1 format?

**Question 8**

What is the name of a test where p+1 or p-1 takes a particular form?

**Question 9**

What is the name of another type of test where p+1 or p-1 takes a particular form?

**Text number 13**

The following table lists the largest known prime numbers of the types mentioned. Some of these prime numbers have been found using distributed computing. In 2009, the Great Internet Mersenne Prime Search project was awarded a prize of USD 100 000 for being the first to find a prime number with at least 10 million digits. The Electronic Frontier Foundation also offers $150,000 and $250,000 for a prime of at least 100 million and 1 billion digits respectively. Some of the largest prime numbers, which are not known to have any particular form (i.e. no simple formula, such as Mersenne's prime numbers), have been found by taking semi-random binary data, converting it to the number n, multiplying it by 256k for some positive integer k, and searching for possible prime numbers between [256kn + 1, 256k(n + 1) - 1]. [citation needed]

**Question 0**

What is the name of a calculation method used to find prime numbers?

**Question 1**

What year was the Great Internet Mersenne Prime Search project launched?

**Question 2**

The Great Internet Mersenne Primary Search, what was the prize for finding a primary with at least 10 million numbers?

**Question 3**

Which organisation offers cash prizes for identifying prime numbers with at least 100 million digits?

**Question 4**

In what time frame have some of the largest prime numbers been found that do not have a distinct form?

**Question 5**

What is the name of one calculation method that can find 100 million prime numbers?

**Question 6**

In what year were 10 million projects implemented?

**Question 7**

In the great Internet Mersenne prime search, the prize was to find a prime with at least 150 000 digits?

**Question 8**

Which organisation offers cash prizes for identifying prime numbers with at least 150 000 digits?

**Question 9**

Where are some of the largest prime numbers without a separate number in between?

**Text number 14**

are prime numbers for any natural number n. Here represents the floor function, i.e. the largest integer that is not greater than that number. The latter formula can be proved using Bertrand's postulate (first proved by Chebyshev) that there is always at least one prime p, where n < p < 2n - 2, for any natural number n > 3. However, to compute A or μ, one must first know an infinite number of primes. The second formula is based on Wilson's theorem and produces 2 many times and all other prime numbers exactly once.

**Question 0**

What is the name of the function that gives the largest integer that is not greater than this number?

**Question 1**

Who was the first to prove Bertrand's postulate?

**Question 2**

For what size of natural number does Bertrand's postulate hold?

**Question 3**

How is the prime number p in Bertrand's postulate expressed mathematically?

**Question 4**

What is the theorem behind the formula that often produces the number 2 and all other prime numbers exactly once?

**Question 5**

What is the name of the function used to find the smallest integer not greater than that number?

**Question 6**

Who was the first to witness Bertrand's primary?

**Question 7**

For what size of natural number does Chebyshev's postulate hold?

**Question 8**

How is the prime number p in Chebyshev's postulate expressed mathematically?

**Question 9**

What is the theorem behind the formula that often produces the number 2 and all other prime numbers exactly twice?

**Text number 15**

can have infinitely many prime numbers only if a and q are cointeger, i.e. their greatest common divisor is one. If this necessary condition is satisfied, Dirichlet's arithmetic progression theorem states that there are infinitely many prime numbers in the progression. The figure below illustrates this when q = 9: the numbers "wrap around" as soon as the multiple of 9 is passed. Primes are highlighted in red. Rows (=progressions) starting with a = 3, 6 or 9 contain at most one prime number. All other rows (a = 1, 2, 4, 5, 7 and 8) have infinitely many prime numbers. Moreover, the prime numbers are evenly distributed over time on these rows - the density of all prime numbers that coincide with a modulo 9 is 1/6.

**Question 0**

What is another way to express the condition that there can be infinitely many prime numbers only if a and q are coefficients?

**Question 1**

If a and q have the same coefficient, by which theorem does an arithmetic progression have an infinite number of prime numbers?

**Question 2**

What is the density of all prime numbers compatible with a modulo 9?

**Question 3**

If q=9 and a=3,6 or 9, how many prime numbers would there be in the progression?

**Question 4**

If q=9 and a=1,2,4,5,7 or 8, how many prime numbers would there be in the progression?

**Question 5**

What is another way of expressing the condition that there can be infinitely many rows only if a and q are coefficients?

**Question 6**

If a and q have the same coefficient, by which theorem does an arithmetic progression have an infinite number of wrappers?

**Question 7**

What is the density of all modulo 9 compatible windings?

**Question 8**

If q=9 and a=3, 6 or 9, how many rounds would be involved?

**Question 9**

If q=9 and a=1,2,4,5, 7 or 8, how many rounds would be involved?

**Text number 16**

The zeta function is closely related to prime numbers. For example, the fact that there are infinitely many prime numbers, as mentioned above, can also be seen with the zeta function: if there were only infinitely many prime numbers, ζ(1) would have a finite value. However, the harmonic series 1 + 1/2 + 1/3 + 1/4 + ... diverges (i.e. exceeds any number), so there must be an infinite number of prime numbers. Another example of the richness of the zeta function and a glimpse of modern algebraic number theory is the following identity from Euler (Basel problem),

**Question 0**

Which function is related to prime numbers?

**Question 1**

What would be the value of the zeta function if there were finite prime numbers?

**Question 2**

Which property of the harmonic series 1 + 1/2 + 1/3 + 1/4 + ... shows that there are an infinite number of prime numbers?

**Question 3**

What does it mean when a harmonic series diverges?

**Question 4**

What kind of mathematical problem is the Basel problem?

**Question 5**

Which function is related to the Basel figures?

**Question 6**

What would be the value of the Basel function if there were finite prime numbers?

**Question 7**

Which property of the harmonic series 1 + 1/2 + 1/3 +1/4 ... shows that there are an infinite number of Basels?

**Question 8**

What does it mean when the Basel series differ?

**Question 9**

Which mathematical problem is the primary one?

**Text number 17**

According to the unproved Riemann hypothesis from 1859, the real part of all zeros of the ζ-function is 1/2 except for s = -2, -4, ..... The connection with prime numbers is that it essentially says that the prime numbers are distributed as regularly as possible.[Clarification needed] From a physical point of view, it roughly says that the irregularity in the distribution of prime numbers is only due to random noise. From a mathematical point of view, it roughly says that the asymptotic distribution of prime numbers (about x/log x less than x are prime numbers, prime number theorem) also holds for much shorter intervals of about the square root of x (intervals close to x). This hypothesis is generally believed to hold. In particular, the simplest assumption is that prime numbers should not have significant irregularities without good reason.

**Question 0**

When was the Riemann hypothesis proposed?

**Question 1**

According to the Riemann hypothesis, the real part of all zeros of the ζ function is equal to 1/2, except for what values of s?

**Question 2**

According to the Riemann hypothesis, what is the source of the irregularity in the distribution of points?

**Question 3**

Which prime distribution according to Riemann's hypothesis holds also for short periods near X?

**Question 4**

Which type of prime distribution is characterized by a distribution of numbers smaller than about x/log x?

**Question 5**

When was the action hypothesis put forward?

**Question 6**

According to the functional hypothesis, the real part of all zeros of the function ζ is 1/2, except for which values of s?

**Question 7**

According to Riemann's hypothesis, what is the source of the irregularity in the distribution of mathematical zeros?

**Question 8**

According to Riemann's hypothesis, which type of null distribution is true also for short periods near X?

**Question 9**

What type of null distribution is characterized by x/log x of numbers smaller than x/log x?

**Text number 18**

In addition to the Riemann hypothesis, many other conjectures have been made about prime numbers. Many of these conjectures are often formulated at a rudimentary level and have taken decades to prove: all four problems posed by Landau in 1912 remain unsolved. One of them is Goldbach's conjecture that every even integer n greater than 2 can be written as the sum of two prime numbers. In February 2011[update] this conjecture has been confirmed for all numbers up to n = 2 - 1017. Weaker claims have been proved, for example Vinogradov's theorem states that any sufficiently large odd integer can be written as the sum of three prime numbers. Chen's theorem says that any sufficiently large even number can be expressed as the sum of a prime and a semi-prime, the product of two primes. Furthermore, any even integer can be written as the sum of six prime numbers. The branch of number theory that studies such questions is called additive number theory.

**Question 0**

When did Landau propose the four conjectural problems?

**Question 1**

According to which conjecture can each even integer n greater than 2 be expressed as the sum of two prime numbers?

**Question 2**

For how many figures has Goldbach's conjecture been proven in February 2011?

**Question 3**

According to which theorem can all large odd integers be expressed as the sum of three prime numbers?

**Question 4**

According to which theorem can every large even integer be written as a prime number summed with a semi-equation?

**Question 5**

When did Vinogradov propose the four conjectural problems?

**Question 6**

According to which conjecture can every odd integer n greater than 2 be expressed as the sum of two prime numbers?

**Question 7**

For how many figures has Goldbach's conjecture been proven in February 2017?

**Question 8**

According to which theorem can all large even integers be expressed as the sum of three prime numbers?

**Question 9**

According to which theorem can every large odd integer be written as a prime number summed by a half prime?

**Text number 19**

The third type of guesses concerns aspects of the distribution of prime numbers. It is assumed that there are infinitely many double primes, i.e. pairs with 2 differences (double prime conjecture). The Polignac conjecture is a confirmation of this conjecture and states that for every positive integer n, there are infinitely many pairs of consecutive prime numbers that differ by 2n. It is conjectured that there are infinitely many prime numbers of the form n2 + 1. These conjectures are special cases of the extended Schinzel hypothesis H. Brocard's conjecture states that there are always at least four prime numbers between the squares of consecutive prime numbers greater than 2. Legendre's conjecture says that for every positive integer n between n2 and (n + 1)2 there is a prime number, given a positive integer n. It follows from Cramér's stronger conjecture.

**Question 0**

By what assumption is there an infinite number of double primes?

**Question 1**

What is twin prime?

**Question 2**

By which conjecture does any positive integer n have an infinite number of pairs of consecutive prime numbers that differ by 2n?

**Question 3**

What is the shape of the infinite number of prime numbers that make up the special cases of Schinzel's hypothesis?

**Question 4**

By which assumption is there always at least 4 prime numbers between squares of consecutive prime numbers greater than 2?

**Question 5**

By what assumption are there an infinite number of double positives?

**Question 6**

What is double positive?

**Question 7**

For any negative integer n, by which conjecture is there an infinite number of consecutive pairs of prime numbers that differ by 2n?

**Question 8**

What is the shape of the infinite number of positives that make up the special cases of Schinzel's hypothesis?

**Question 9**

By which assumption is there always at least 1 prime between squares of consecutive prime numbers greater than 2?

**Text number 20**

For a long time, number theory in general, and the study of prime numbers in particular, was regarded as a canonical example of pure mathematics with no applications other than its own interest in the study of the subject, apart from the use of the gear teeth of prime numbers to evenly distribute wear. In particular, number theorists such as the British mathematician G. H. Hardy, were proud of the fact that they were doing work that had no military significance. However, this view was shattered in the 1970s when it was publicly announced that prime numbers could be used as a basis for creating public key cryptographic algorithms. Prime numbers are also used in hash tables and pseudo-random number generators.

**Question 0**

What general theory, apart from the study of prime numbers, was considered the official example of pure mathematics?

**Question 1**

Which British mathematician was proud to do work that he thought had no military value?

**Question 2**

When was it discovered that prime numbers can be applied to create public key cryptographic algorithms?

**Question 3**

What is the other application of prime numbers besides public key cryptography?

**Question 4**

What kind of number generators use prime numbers?

**Question 5**

What general theory, apart from the study of prime numbers, was considered the official example of the military?

**Question 6**

Which British mathematician took pride in doing work that he thought had no mathematical merit?

**Question 7**

When was it discovered that prime numbers can be used to create public key military algorithms?

**Question 8**

Besides public key encryption, what is another military application?

**Question 9**

What types of number generators are used in military aircraft?

**Text number 21**

According to Giuga's conjecture, this equation is also a sufficient condition for p to be a prime. Another consequence of Fermat's Little Theorem is the following: if p is a prime number other than 2 and 5, 1/p is always a repeated decimal number whose period is p - 1 or the divisor of p - 1. The fraction 1/p, similarly expressed by the base q (and not by the base 10), has a similar effect provided that p is not a prime of q. Wilson's theorem states that the integer p > 1 is prime if and only if the factorial (p - 1)! + 1 is divisible by p. Furthermore, the integer n > 4 is a composite if and only if (n - 1)! is divisible by n.

**Question 0**

Assuming that p is a prime number other than 2 or 5, what type of decimal number is 1/p always according to Fermat's theorem?

**Question 1**

According to Fermat's theorem, which period 1/p is always obtained if p is a prime number other than 2 or 5?

**Question 2**

According to Wilson's theorem, which factorial must be divisible by p if some integer p > 1 is considered prime?

**Question 3**

According to Wilson's theorem, which factorial must be divisible by n if some integer n > 4 is considered to be compound?

**Question 4**

What condition must be satisfied for 1/p to be expressed as a base q instead of 10, but the period must still be p - 1?

**Question 5**

Assuming that p is a prime number other than 2 or 5, what type of decimal number is 1/p always, according to Gluga's theorem?

**Question 6**

According to Gluga's theorem, which period 1/p is always obtained if p is a prime number other than 2 or 5?

**Question 7**

According to Giuga's theorem, which factorial must be divisible by p if some integer p > 1 is considered prime?

**Question 8**

According to Gluga's theorem, which factorial must be divisible by n if some integer n > 4 is considered to be connected?

**Question 9**

What condition must be satisfied for p to be expressed in 1 instead of 10, but the period must still be p-1?

**Text number 22**

Many public key cryptographic algorithms, such as RSA and Diffie-Hellman key exchange, are based on large prime numbers (for example, RSA often uses 512-bit prime numbers and Diffie-Hellman typically uses 1024-bit prime numbers). RSA is based on the assumption that it is much easier (i.e. more efficient) to multiply two (large) numbers x and y than to compute x and y (which are assumed to be similar) if only the input xy is known. The Diffie-Hellman key exchange is based on the assumption that efficient algorithms exist for modular exponentiation, while the inverse operation, discrete logarithm, is thought to be a difficult problem.

**Question 0**

What is one type of public key encryption algorithm?

**Question 1**

What is another type of public key encryption algorithm?

**Question 2**

How many bits are often in the prime numbers used in the RSA public key cryptography algorithm?

**Question 3**

On what exponential does the exchange of Diffie-Hellman keys depend?

**Question 4**

How many bits are typically used for the Diffie-Hellman key exchange prime numbers?

**Question 5**

What is one type of private key encryption algorithm?

**Question 6**

What is another type of private key encryption algorithm?

**Question 7**

How many bits are often in the prime numbers used in the RSA private key encryption algorithm?

**Question 8**

On what exponent value does the prime logarithm key change depend?

**Question 9**

How many bits are typically used in a Diffie-Hellman key change logarithm?

**Text number 23**

The evolutionary strategy used by Magicicada crickets makes use of prime numbers. These insects spend most of their lives underground as caterpillars. They fall asleep and emerge from their burrows only after 7, 13 or 17 years, when they fly around, reproduce and die after a few weeks at most. This logic is thought to be due to the fact that birth intervals are so short that it is very difficult to evolve predators that can specialise as predators of Magicicadas. If Magicicadas occurred at non-prime intervals, for example every 12 years, predators appearing every 2, 3, 4, 6 or 12 years would certainly encounter them. Over 200 years, the average predator population during a hypothetical outbreak of 14- and 15-year-old hatchlings would be up to 2% larger than during an outbreak of 13- and 17-year-old hatchlings. Although this advantage is small, it appears to have been sufficient for natural selection to have led to a preference for the early life cycle of these insects.

**Question 0**

Which insect species uses prime numbers in its evolutionary strategy?

**Question 1**

Where do pigs spend most of their lives?

**Question 2**

At what time of year other than 7 and 13 do crane swords sleep?

**Question 3**

What is the logic behind the evolutionary strategy of the primordial cyberspace?

**Question 4**

How much larger would hoki predator populations be if hoki outbreaks occurred every 14 and 15 years?

**Question 5**

Which type of insect uses Magicicadas in its evolutionary strategy?

**Question 6**

Where do predators spend most of their lives?

**Question 7**

At what time of year other than 7 and 13 do birds of prey spawn?

**Question 8**

What is the logic behind the outbreak of crane swords?

**Question 9**

How much larger would cricket populations be if predator outbreaks occurred every 14 and 15 years?

**Text number 24**

The concept of prime numbers is so important that it has been generalised in different ways in different areas of mathematics. Generally speaking, "prime number" means, in an appropriate sense, minimality or indivisibility. For example, a prime field is the smallest subfield of a field F that contains both 0 and 1. It is either Q or a finite field with p elements, from name. Often the word prime also has another, additional meaning, namely that any object can in principle be uniquely decomposed into its prime components. For example, in knot theory, a prime knot is a knot that is indivisible in the sense that it cannot be written as the sum of two nontrivial knots. Any node can be expressed uniquely as the combined sum of primary nodes. Primary models and primary 3-manifolds are other examples of this type of node.

**Question 0**

What does the word prime usually refer to?

**Question 1**

What is the prime field of an F-field containing 0 and 1?

**Question 2**

What does it mean that a node is considered to be indestructible?

**Question 3**

How can a node be clearly shown?

**Question 4**

What additional meaning is given when the word prime is used?

**Question 5**

What does the word component usually refer to?

**Question 6**

What is the initial node field of an F-field containing 0 and 1?

**Question 7**

What does it mean that a node is considered a p-element?

**Question 8**

How can a node be a field of F?

**Question 9**

What additional meaning is given when the word component is used?

**Text number 25**

Prime numbers give rise to two more general concepts, which apply to the elements of any commutative ring R. R is an algebraic structure in which addition, subtraction and multiplication are defined: primal elementary elements and irreducible elementary elements. An element p of R is called a prime element if it is neither zero nor unity (that is, it has no multiplicative inverse) and if it satisfies the following condition: if there are x and y in R such that p divides the input xy, then p divides x or y. An element is irreducible if it is not a unit and cannot be written as the product of two non-unitary ring elements. In the integer ring Z, the set of primes is equal to the set of irreducible primes, which is

**Question 0**

What is the name of an algebraic structure in which addition, subtraction and multiplication are defined?

**Question 1**

What is one general concept concerning the elements of commutative rings?

**Question 2**

What is another general concept concerning the elements of commutative rings?

**Question 3**

What is one condition that must be satisfied by an element p of R to be considered an element?

**Question 4**

Under what condition is an element irreducible?

**Question 5**

What is the name of an integer where addition, subtraction and multiplication are defined?

**Question 6**

What is one general concept that applies to the elements of the general xy?

**Question 7**

What is another general concept that applies to the elements of the general xy?

**Question 8**

What is the one condition that must be satisfied by the prime p of $ to be considered a multiplicative inverse?

**Question 9**

Under what condition is an element universal xy?

**Text number 26**

The basic theory of arithmetic still applies in unambiguous factorization domains. An example of such a domain is the Gaussian integers Z[i], i.e. the set of complex numbers of the form a + bi, where i denotes an imaginary unit and a and b are arbitrary integers. Its elements are called Gaussian prime numbers. Not all prime numbers (in Z) are Gaussian prime numbers: in a larger ring, Z[i] 2 is the product of two Gaussian prime numbers (1 + i) and (1 - i). Rational prime numbers (i.e. prime numbers of Z) of the form 4k + 3 are Gaussian prime numbers, while rational prime numbers of the form 4k + 1 are not.

**Question 0**

Which theorem holds for unique factorization domains?

**Question 1**

What is an example of a unique factoring area?

**Question 2**

What is the form of complex Gaussian integers?

**Question 3**

What do a and b represent in the Gaussian integer expression?

**Question 4**

What is the shape of rational prime numbers?

**Question 5**

Which theorem holds for Gauss's unique prime numbers?

**Question 6**

What is one example of unique rational prime numbers?

**Question 7**

What is the shape of complex rational prime numbers?

**Question 8**

What do a and b represent in a rational prime clause?

**Question 9**

What shape are rational Gaussians?

**Text number 27**

In ring theory, the concept of number is usually replaced by the concept of ideal. Primal ideals, which generalise the elements in the sense that the principal ideal produced by an element is a primal ideal, are an important tool and object of study in commutative algebra, algebraic number theory and algebraic geometry. The prime ideals of the integer number field are ideals (0), (2), (3), (5), (7), (11), ... The fundamental theory of arithmetic generalizes to the Lasker-Noether theorem, which expresses each ideal of Noether's commutative frame as the intersection of principal ideals, which are suitable generalizations of the powers of the prime factors.

**Question 0**

Where in the theory is the concept of a number replaced by the concept of an ideal?

**Question 1**

What types of ideals generalise the elements?

**Question 2**

What kind of number theory exploits and explores prime ideas?

**Question 3**

Which theorem can be simplified to the Lasker-Noether theorem?

**Question 4**

In which type of commutative ring does Lasker-Noether's theorem express each ideal as an intersection of primary ideals?

**Question 5**

In which theory is the concept of number replaced by Noether's concept of arithmetic?

**Question 6**

What ideals generalise Noether's arithmetic?

**Question 7**

What kind of number theory exploits and explores Noether's arithmetic?

**Question 8**

Which theorem can be simplified to a theorem of primary ideals?

**Question 9**

In which type of commutative ring does the prime ideal theorem express each ideal as a Noether arithmetic intersection?

**Text number 28**

Primary ideals are points of algebro-geometric objects through the concept of a ring spectrum. Arithmetic geometry also benefits from this concept, and many concepts appear in both geometry and number theory. For example, the basic problem of algebraic number theory, the factorization or ramification of prime ideals when raised to the extension field, resembles to some extent the ramification of geometry. Such questions of ramification also occur in number theory, which is concerned only with integers. For example, the prime ideals of the integer ring of quadratic number fields can be used to prove quadratic reciprocity concerning the solvability of quadratic equations.

**Question 0**

What are the points of algebro-geometric objects?

**Question 1**

What does the factorisation of primary ideals approximate?

**Question 2**

In which type of ring can prime ideas be used to strengthen quadratic reciprocity?

**Question 3**

What does quadratic reciprocity aim to achieve?

**Question 4**

What are the points of quadratic bodies?

**Question 5**

What does factorisation of quadratic equations approximate?

**Question 6**

In which type of ring can prime ideas be used to strengthen number theory?

**Question 7**

What is the purpose of branching geometry?

**Question 8**

What exists in both quadratic equations and integers?

**Text number 29**

In particular, this norm decreases when the number is multiplied by p, which is in sharp contrast to the usual absolute value (also called the infinite prime). While completing Q (roughly speaking, filling in the gaps) with respect to the absolute value gives a field of real numbers, completing it with respect to the p-adic norm |-|p gives a field of p-adic numbers. According to Ostrowski's theorem, these are basically all possible ways to complete Q. Certain arithmetic questions related to Q or to more general global fields can be passed back and forth to the complemented (or local) fields. This local-global principle underlines once again the importance of prime numbers for number theory.

**Question 0**

What happens to the norm when the number is multiplied by p?

**Question 1**

Where or from where can the general global fields be transferred?

**Question 2**

Complementing Q with respect to what gives a field of real numbers?

**Question 3**

Which principle emphasises the importance of prime numbers in number theory?

**Question 4**

What happens to the norm when the number is multiplied by Q?

**Question 5**

Where or from where can general arithmetic questions be transferred?

**Question 6**

Complementing p by what ratio gives a field of real numbers?

**Question 7**

Which principle emphasises the importance of real numbers?

**Question 8**

What decreases when the number is prime?

**Text number 30**

Many artists and writers have been influenced by the primeval figures. French composer Olivier Messiaen used prime numbers to create amethrical music using "natural phenomena". In works such as La Nativité du Seigneur (1935) and Quatre études de rythme (1949-50), he simultaneously uses motifs with lengths given by different prime numbers to create unpredictable rhythms: the prime numbers 41, 43, 47 and 53 appear in the third etude 'Neumes rythmiques'. According to Messiaen, this style of composition was 'inspired by the movements of nature, movements whose duration is free and uneven'.

**Question 0**

Which French composer wrote music in Amharic using prime numbers?

**Question 1**

What is one of Olivier Messiaen's works?

**Question 2**

What is the second work created by Olivier Messiaen?

**Question 3**

Where in the prefixes of Neumes rythmiques do the prime numbers 41, 43, 47 and 53 appear?

**Question 4**

Messiaen says that the composition with the initials was inspired by what?

**Question 5**

Which French composer wrote metrical music using prime numbers?

**Question 6**

What is one of Neumes' works?

**Question 7**

What is the second work created by Neumes?

**Question 8**

Where does prime 19 appear in the etude of Neumes rythmiques?

**Question 9**

Where does Neumes say the inspiration for the composition of the preludes came from?

**Document number 470**

**Text number 0**

The Rhine (Romansh: Rein, German: Rhein, French: le Rhin, Dutch: Rijn) is a European river that begins in the Swiss canton of Grisons, south-east of the Swiss Alps, forms part of the Swiss-Austrian, Swiss-Liechtenstein, Swiss-German and French-German borders, flows through the Rhineland and finally flows into the North Sea in the Netherlands. The largest city on the Rhine is Cologne, Germany, home to over 1 050 000 people. It is the second longest river in central and western Europe (after the Danube), at about 1,230 kilometres (760 miles),[note 2][note 1] with an average flow of about 2,900 m3/s (100,000 cu ft/s).

**Question 0**

Where does the Rhine empty?

**Question 1**

What is the largest city through which the Rhine flows?

**Question 2**

Which river is bigger than the Rhine?

**Question 3**

How tall is Rein?

**Question 4**

Where is Rein?

**Question 5**

Which country does Rei land in?

**Question 6**

How tall is Rein?

**Question 7**

What is the smallest country through which the Rhine flows?

**Question 8**

How long is the Netherlands?

**Question 9**

In which country is the Danube emptying?

**Question 10**

What is the population of the Netherlands?

**Question 11**

How long is Germany?

**Text number 1**

The variants of the name Rhine in modern languages are all derived from the Gallic name Rēnos, adapted in Roman geography (1st century BC) to Greek Ῥῆνος (Rhēnos), Latin Rhenus.[note 3] The spelling Rh- in English Rhine and German Rhein and French Rhin is due to the influence of Greek orthography, while the pronunciation -i- is due to the Gaulish name \*Rīnaz being adopted proto-germanically from Old Frankish (Old English Rín, Old High German Rīn, Dutch Rijn (formerly also Rhijn)). The diphthong of modern German Rhine (also adopted in Romance Rhine, Rain) is a Middle Germanic development in the early modern period, while the Low Germanic name Rī(n) retains the older vowel form,[note 4] as does the Ripuarian Rhing, while the diphthongized Rhei, Rhoi in Palatinate. Spanish, with French, has adopted the Germanic vowel form Rin-, while Italian, Occitan and Portuguese retain the Latin Ren-.

**Question 0**

Where does the name Rein come from?

**Question 1**

What is the French name of the Rhine?

**Question 2**

What is the proto-germanic variant of the name of the Rhine?

**Question 3**

What century does the name of the Rhine date back to?

**Question 4**

Where does the name Rein come from?

**Question 5**

What is the name of the Rhine in French?

**Question 6**

What is the proto-germanic translation of the Gallic name of the Rhine?

**Question 7**

What is the name of the Rhine in Dutch?

**Question 8**

How was the Dutch name of the Rhine originally spelled?

**Question 9**

What are the origins of the variants of the name of the Rhine in ancient languages?

**Question 10**

From which century does Germanic vocalism Rin originate?

**Question 11**

What is the century of origin of the English Rhine spelling with Rh-?

**Question 12**

In which century did the French introduce the Germanic vocalism Rin-?

**Text number 2**

The length of the Rhine is traditionally measured in "Rhine kilometres" (Rhine kilometres), a scale introduced in 1939, from the old Rhine bridge in Konstanz (0 km) to the Hoek van Holland (1036.20 km). The length of the river has been considerably shortened from its natural course due to canalisation projects in the 19th and 20th centuries.[note 7] The total length of the Rhine, which includes Lake Constance and the Alpine Rhine, is more difficult to measure objectively; the Dutch Rijkswaterstaat reported its length as 1,232 kilometres (766 mi) in 2010.[note 1] The length of the Rhine is the length of the Rhine from the natural course of the river to the natural course of the river.

**Question 0**

What is the traditional method for measuring the Rhine?

**Question 1**

When was the scale for measuring the Rhine introduced?

**Question 2**

Where does the measurement of the Rhine begin?

**Question 3**

Where does the Rhine measurement end?

**Question 4**

What has shortened the Rhine?

**Question 5**

What is the traditional measurement of the Rhine?

**Question 6**

When was the Rhine measurement introduced?

**Question 7**

Where does Rein start?

**Question 8**

Where does the Rhine end?

**Question 9**

Why has Rei been shortened?

**Question 10**

How long is the old Rhine Bridge in Konstanz?

**Question 11**

What is the length of the Hoek van Holland in conventional terms?

**Question 12**

In what year was the Old Rhine Bridge shortened?

**Question 13**

What year did Hoek van Holland start its canalisation projects?

**Question 14**

How long is Lake Constance?

**Text number 3**

Near Tamins-Reichenau, the leading and trailing edges merge to form the Rhine. Near Chur, the river makes a sharp turn to the north. This section is almost 86 kilometres long and drops from an altitude of 599 metres to 396 metres. It flows in a wide glacial valley known as the Rhine Valley (Rheintal in German). Near Sargans, a natural dam only a few metres high prevents it from flowing into the open Seeztal valley and on through Lakes Walen and Zurich to the River Aare. The Alpine Rhine starts in the westernmost part of the Swiss canton of Grisons and later forms the border between Switzerland on the west and Liechtenstein and later Austria on the east.

**Question 0**

Which way does the Rhine turn near Chur?

**Question 1**

How long is the stretch of the Rhine near Chur?

**Question 2**

What is the Alpine valley through which the Rhine flows?

**Question 3**

What is the natural dam through which the Rhine flows?

**Question 4**

What is the other country where Rhine is different from Switzerland?

**Question 5**

Where does the Rhine make a sharp turn to the north?

**Question 6**

How long is the northbound section?

**Question 7**

What is the height of the north-facing section?

**Question 8**

What is a glacial alpine valley?

**Question 9**

The Rhine forms the border between Austria and which country?

**Question 10**

Where does the Rhine make a sharp turn to the south?

**Question 11**

How wide is the glacial Alpine valley known as the Rhine Valley?

**Question 12**

What is the name of the natural dam linking the Rhine Valley?

**Question 13**

How long is Austria?

**Question 14**

What is the altitude of the Swiss canton?

**Text number 4**

The mouth of the Rhine at Lake Constance forms an inland estuary. The estuary is bordered to the west by the Alter Rhein ("Old Rhine") and to the east by a modern canalised section. Most of the estuary is a nature reserve and bird sanctuary. It includes the Austrian towns of Gaixau, Höchst and Fußach. The natural Rhine originally branched into at least two branches, forming small islands by sedimentation. In the local Low German dialect, the unit is pronounced 'Isel', which is also the local pronunciation of the word Esel ('donkey'). Many local fields have an official name that includes this element.

**Question 0**

To which lake does the Rhine form an inland estuary?

**Question 1**

What is the area of the Rhine estuary that borders the west?

**Question 2**

What is the eastern boundary of the Rhine estuary?

**Question 3**

What is the singular form of the names of the islands of the Rhine in the local Low German dialect?

**Question 4**

Which animal are the Rhine islands named after?

**Question 5**

The inland estuary at the mouth of the Rhine is with which lake?

**Question 6**

What limits the Rhine estuary in the east?

**Question 7**

What limits the Rhine estuary in the west?

**Question 8**

Where did the Rhine branch off from in Austria?

**Question 9**

What is the Almanic dialect used to describe islands outside Austria?

**Question 10**

What forms the inland estuary of Lake Constance?

**Question 11**

What is the delta bounded by in the south?

**Question 12**

What is the delta bounded by in the north?

**Question 13**

What is one mammal that lives in a nature reserve and a bird sanctuary?

**Question 14**

Which animal once swam in the Rhine?

**Text number 5**

The rationing of the Rhine was called for by building an upper channel near Diepoldschau and a lower channel at Fußach to prevent persistent flooding and heavy sedimentation in the western Rhine estuary. The Dornbirner Ach also had to be diverted and now flows parallel to the canalised Rhine into the lake. Its water is darker in colour than that of the Rhine because of the lighter sediment load from the Rhine, which originates from the higher mountain range. It is expected that the continued influx of sediment into the lake will cause the lake to become muddy. This has already happened to the former Lake Tuggenersee.

**Question 0**

Where is the regulation of the upper Rhine canal?

**Question 1**

What is the regulation of the lower Rhine canal?

**Question 2**

Apart from the constant flooding, why else would the Rhine need to be regulated?

**Question 3**

Where does Rein flow now after the Dornbirner-Ach was diverted?

**Question 4**

What can be expected when sediment continues to enter the Dornbirner lake?

**Question 5**

Where was the Rhine regulated on the lower channel?

**Question 6**

Where was the Rhine regulated in the upper channel?

**Question 7**

Why was the Rhine regulated?

**Question 8**

Which river was diverted and now flows in the direction of the Rhine?

**Question 9**

What is causing the siltation of a lake near the Rhine?

**Question 10**

Where is the regulation of the Western Rhine Canal?

**Question 11**

Where is the regulation of the Eastern Rhine Canal?

**Question 12**

Which water is lighter in colour than the Rhine?

**Question 13**

Why was Lake Tuggenersee regulated?

**Question 14**

Which lake no longer has sludge?

**Text number 6**

Lake Constance consists of three bodies of water: the Obersee ("upper lake"), the Untersee ("lower lake") and the section of the Rhine connecting the two, called the Seerhein ("Lake Rhine"). The lake is located in Germany, Switzerland and Austria near the Alps. Its shores are located in the German states of Bavaria and Baden-Württemberg, the Austrian state of Vorarlberg and the Swiss cantons of Thurgau and St. Gallen. The Rhine flows into it from the south along the Swiss-Austrian border. It is located at approximately 47°39′N 9°19′E / 47.650°N 9.317°E / 47.650; 9.317.

**Question 0**

How many water bodies make up Lake Constance?

**Question 1**

Which lake connects the Rhine and Lake Constance?

**Question 2**

What does Obersee mean?

**Question 3**

What does Untersee mean?

**Question 4**

On which border does the Rhine flow from the south?

**Question 5**

How many water bodies make up Lake Constance?

**Question 6**

Where else but Germany and Switzerland is Lake Constance?

**Question 7**

Which mountain range is Lake Constance located in?

**Question 8**

Where is the border between Switzerland and Austria?

**Question 9**

Lake Constance separates Bavaria from which other state?

**Question 10**

How many bodies of water make up the Rhine?

**Question 11**

Where is the Bavarian border?

**Question 12**

Where is the German border?

**Question 13**

On which border does the Rhine flow from the north?

**Question 14**

How many water bodies make up the Obersee?

**Text number 7**

The cold, grey mountain water continues to flow for some distance into the lake. The cold water flows close to the surface and does not initially mix with the warmer, green water of Lake Superior. But then, at the so-called Rheinbrech, the Rhine's waters suddenly drop deeper due to the higher density of the cold water. The current rises to the surface again on the northern shore of the lake (in Germany) off the island of Lindau. The water then follows the northern bank as far as Hagnau am Bodensee. A small part of the flow is diverted to Lake Überlingen off the island of Mainau. Most of the water flows through the Konstanz funnel into the Rhine trough ("Rhine trough") and the Seerhine. Depending on the water level, this flow of Rhine water is clearly visible along the entire length of the lake.

**Question 0**

Why does the water of the Rhine drop to the depths at Rheinbrech?

**Question 1**

Where do cold and warm water meet warm water?

**Question 2**

What is the island on the German Rhine where warm and cold waters meet?

**Question 3**

Which lake on the German island of Mainau receives only a fraction of the Rhine's flow?

**Question 4**

How much of the lake that joins the Rhine can be seen from the German islands?

**Question 5**

Where does the cold water mix with Lake Constance?

**Question 6**

Where does the cold water flow from the Rhine and Lake Constance flow into the island?

**Question 7**

Which other lake receives a small proportion of the cold water flow from Lake Constance?

**Question 8**

What does the word Rheinrinne mean?

**Question 9**

What makes the flow of the Rhine visible?

**Question 10**

Which water suddenly drops to the depths because of the higher density of warmer water?

**Question 11**

What does the word Seerhein mean?

**Question 12**

Which water is constantly visible along the entire length of the lake?

**Question 13**

Much of the flow is diverted from the island of Mainau to where?

**Question 14**

Where is the cold green water?

**Text number 8**

The Rhine flows out of Lake Constance, flows generally west as the Hochrhein, bypasses the Rhine Falls and joins its main tributary, the Aare River. The Aare more than doubles the Rhine's volume, which averages almost 1 000 m3/s, and provides more than a fifth of the Rhine's water volume at the Dutch border. The Aare also contains the waters of the 4 274 m peak of the Finsteraarhorn, the highest point in the Rhine basin. The Rhine roughly forms the border between Germany and Switzerland from Lake Constance, excluding the canton of Schaffhausen and parts of the cantons of Zurich and Basel-Stadt, until it turns north at the so-called Rhine bend at Basel and leaves Switzerland.

**Question 0**

Which way does the Rhine flow after it rises from Lake Constance?

**Question 1**

What is the largest tributary of the Rhine?

**Question 2**

How much water does Aare give Rini?

**Question 3**

Where is the highest point in the Rhine basin?

**Question 4**

Where is the so-called knee of the Rhine?

**Question 5**

Which way does the Rhine flow when it rises from Lake Constance?

**Question 6**

What is the largest tributary of the Rhine?

**Question 7**

How much water does the Rhine get from the Aare?

**Question 8**

What is the highest point in the Rhine basin?

**Question 9**

Between Switzerland and which other country is there a rough border, the Rhine?

**Question 10**

What is the largest tributary of Lake Constance?

**Question 11**

How much will Hochrhein more than double the Rhine's water discharges?

**Question 12**

Where does Lake Constance come from?

**Question 13**

Which lake contains part of the Rhine Falls?

**Question 14**

What is the lowest point of the Rhine basin?

**Text number 9**

In the centre of Basel, the first major city along the river, lies the "Rhine Knee", a large bend where the Rhine changes direction from west to north. This is where the upper reaches of the Rhine end. Legally, the Middle Rhine Bridge is the boundary between the Upper and Upper Rhine. The river now flows northwards as the Upper Rhine through the Upper Rhine Plain, which is about 300 km long and up to 40 km wide. The main tributaries in this area are the Ill below Strasbourg, the Neckar at Mannheim and the Main opposite the Main. In Mainz, the Rhine leaves the Rhine valley and flows through the Mainz basin.

**Question 0**

What is the first big city on the Rhine?

**Question 1**

What is the name of the Rhine bend in Basel?

**Question 2**

What is the border between the high and upper Rhine?

**Question 3**

How long is the upper Rhine?

**Question 4**

How wide is the Rhine's plateau?

**Question 5**

What is the first big city along the Rhine?

**Question 6**

What is the first big bend in the Rhine?

**Question 7**

The bend in the Rhine runs from the west in which direction?

**Question 8**

What ends at this bend in the Rhine?

**Question 9**

What is the legal boundary between the High Rind and the Upper Rind?

**Question 10**

What is the name of the bend where the Rhine changes direction from east to north?

**Question 11**

What is the last big bend in the Rhine?

**Question 12**

What is the name of the last great city on the Rhine?

**Question 13**

How long is the Central Bridge?

**Question 14**

How wide is the Mainz pool?

**Text number 10**

The area of the upper Rhine was significantly changed by the Rhine straightening programme in the 19th century. The flow rate increased and the water table dropped significantly. Dead branches dried up and the amount of floodplain forests was drastically reduced. The Grand Canal d'Alsace was dug on the French side, carrying a significant part of the river water and all traffic. In some places there are large compensation reservoirs, such as the huge Bassin de compensation de Plobsheim in Alsace.

**Question 0**

In which century was there a programme to straighten the Rhine?

**Question 1**

What happened to the flow rate of the Rhine during the Rhine straightening programme?

**Question 2**

What happened to the Rhine's groundwater during the Rhine Rectification Programme?

**Question 3**

Which canal was dug in France to channel the waters of the Rhine?

**Question 4**

What is the Bassin de compensation de Plobsheim in Alsace?

**Question 5**

Which area of the Rhine was changed by the Rhine Rectification Programme?

**Question 6**

When did the Rhine Rectification Programme start?

**Question 7**

What happened to the flow rate of the Rhine as a result of the correction programme?

**Question 8**

What happened to the groundwater table with the Rhine Rectification Programme?

**Question 9**

What carries a significant part of the Rhine through France?

**Question 10**

In which century did the Grand Canal d'Alsace end?

**Question 11**

What reduced the flow rate and caused the groundwater level to rise?

**Question 12**

What caused the significant change in the Lower Rhine area?

**Question 13**

In which century did all the dead branches dry up?

**Question 14**

In which century did the volume of forests in the floodplain increase?

**Text number 11**

The Rhine is Germany's longest river. At this point, the Rhine meets some other major tributaries, such as the Neckar, Main and later the Moselle, with an average flow of over 300 m3/s (11 000 cu ft/s). North-eastern France drains into the Rhine via the Moselle; smaller rivers discharge into the highlands of the Vosges and Jura mountains. Most of Luxembourg and a very small part of Belgium also discharge into the Rhine via the Moselle. Approaching the Dutch border, the Rhine has an average annual flow of 2 290 m3/s (81 000 cu ft/s) and an average width of 400 m (1 300 ft).

**Question 0**

What is the longest river in Germany?

**Question 1**

Where does the Rhine meet its tributary Neckar?

**Question 2**

What is the average discharge of the Moselle into the Rhine?

**Question 3**

What is the main tributary of the Rhine that runs through north-eastern France and part of Belgium?

**Question 4**

What is the average width of the Rhine?

**Question 5**

Which country's longest river is the Rhine?

**Question 6**

In which country does the Rhine meet its main tributaries?

**Question 7**

Which of Germany's tributaries produces the most water?

**Question 8**

Which country does Moselle take the Rhine to?

**Question 9**

How much Rhine is discharged at the Dutch border?

**Question 10**

What is the shortest river in Germany?

**Question 11**

What is the average discharge of the Moselle into the Neckar?

**Question 12**

How wide is the Jura Mountains?

**Question 13**

How much water does the Rhine discharge at the French border?

**Question 14**

How wide is the Mosel?

**Text number 12**

Between Bingen and Bonn, the central Rhine flows through the Rhine Gorge, an erosion-generated formation. The rate of erosion corresponded to the rate of land uplift in the area, so that the river remained roughly at its original level, while the surrounding areas rose. The gorge is quite deep, and is a stretch of river known for its numerous castles and vineyards. It is a UNESCO World Heritage Site (2002) and is known as the "Romantic Rhine", with more than 40 castles and forts dating from the Middle Ages and many charming and delightful country villages.

**Question 0**

What flows between Bingen and Bonn?

**Question 1**

Which gorge is between Bingen and Bonn?

**Question 2**

How was the Rhine Gorge formed?

**Question 3**

What is the area near the Rhine Gorge where there are medieval castles?

**Question 4**

What flows between Bingen and Bonn?

**Question 5**

Where between Bingen and Bonn flows the Central Rhine?

**Question 6**

What is the Rhine Gorge known for?

**Question 7**

What is the part of the Rhine Gorge recognised by UNESCO?

**Question 8**

What year was the "Romantic Rhine" built?

**Question 9**

How many rural villages can you find on a UNESCO World Heritage site?

**Question 10**

Which formation was formed when erosion stopped?

**Question 11**

How many vineyards are located on the "romantic Rhine"?

**Question 12**

What flows after Bingen and Bonn?

**Text number 13**

Until the early 1980s, industry was a major source of water pollution. Although there are many factories and plants along the Rhine as far away as Switzerland, most of them are concentrated in the lower reaches of the Rhine, where the river flows past the cities of Cologne, Düsseldorf and Duisburg. Duisburg is home to Europe's largest inland port and serves as a hub for the seaports of Rotterdam, Antwerp and Amsterdam. The Ruhr, which joins the Rhine at Duisburg, is now a clean river, thanks to tighter environmental controls, a shift from heavy to light industry and clean-up measures such as slagging and afforestation of riparian land. The Ruhr now supplies the region with drinking water. Its discharge to the Rhine is 70 m3/s (2 500 m3/s). Other rivers in the Ruhr area, notably the Emscher, are still heavily polluted.

**Question 0**

What contributed to the pollution of the Rhine?

**Question 1**

Where are most of the factories concentrated along the Rhine?

**Question 2**

What is the largest inland port in Europe?

**Question 3**

Which river joins the Rhine in Duisburg?

**Question 4**

What does dysentery offer its community?

**Question 5**

What did industry do to Rhineland until the 1980s?

**Question 6**

Which part of Rhine has the most factories?

**Question 7**

Which country has the most Rhine-polluting factories?

**Question 8**

Which city has the largest inland port in Europe?

**Question 9**

Which river joins the Rhine in Duisburg?

**Question 10**

What was a major source of water pollution since the early 1980s?

**Question 11**

Where are the fewest factories?

**Question 12**

What is the smallest inland port in Europe?

**Question 13**

Which river separates the Rhine from Duisburg?

**Question 14**

What river is now considered unclean?

**Text number 14**

The dominant economic sectors in the Central Rhine region are viticulture and tourism. The Rhine Gorge between Rüdesheim am Rhein and Koblenz is a UNESCO World Heritage Site. Near Sankt Goarshausen, the Rhine flows around the famous Lorelei cliff. The central Rhine valley can be considered the epitome of Rhine Romanticism, with notable architectural monuments, vine-covered slopes, settlements nestled on narrow riverbanks and numerous castles lined up on the top of steep slopes.

**Question 0**

What is the dominant economic sector in Central Rhine apart from wine-growing?

**Question 1**

The Rhine Gorge between Koblenz and what is a UNESCO World Heritage Site?

**Question 2**

What is the famous rock near Sanke Goarshausen?

**Question 3**

What is considered the embodiment of Rhine Romanticism?

**Question 4**

What is the other dominant economic activity in the Central Slope besides wine growing?

**Question 5**

What is the Rhine Gorge?

**Question 6**

The Rhine Gorge is between Koblenz and which other city?

**Question 7**

What is the name of the famous rock around which the Rhine flows?

**Question 8**

Where is the famous rock around which the Rhine flows?

**Question 9**

What are the least dominant economic sectors in the Central Rhine region?

**Question 10**

What is located after Rüdesheim am Rhein and Koblenz?

**Question 11**

What was removed from the UNESCO World Heritage List?

**Question 12**

What is the name of the famous rock where the Rhine flows?

**Question 13**

Where is the most populated?

**Text number 15**

The Lower Rhine flows through North Rhine-Westphalia. Its banks are generally densely populated and industrialised, especially the urban centres of Cologne, Düsseldorf and the Ruhr. Here, the Rhine flows through Germany's largest conurbation, the Rhine-Ruhr area. One of the most important cities in this area is Duisburg, which has Europe's largest river port (Duisport). The area below Duisburg is more agricultural. Wesel, 30 km downstream from Duisburg, is the western end of another east-west shipping route, the Wesel-Datteln Canal, parallel to the Lippe. Between Emmerich and Cleves, the Emmerich Rhine Bridge, Germany's longest suspension bridge, crosses the 400-metre wide river. Near Krefeld, the river crosses the Uerdingen line, which separates areas where Low and High German are spoken.

**Question 0**

Which city has the largest port in Germany?

**Question 1**

What is the Wesel Channel?

**Question 2**

Along which canal does the Wessel-Datteln Canal run?

**Question 3**

What is the largest suspension bridge in Germany?

**Question 4**

How wide is the Rhine in Germany between Emmrich and Cleves?

**Question 5**

Which part of the Rhine flows through North Rhine-Westphalia?

**Question 6**

What is the name of the area that is the largest agglomeration on the Rhine?

**Question 7**

What is the name of the largest port in Europe?

**Question 8**

What is the name of the longest bridge in Germany?

**Question 9**

How wide is the Rhine in Germany?

**Question 10**

Where does the upper Rhine flow?

**Question 11**

Which banks tend to be sparsely populated and non-industrialised?

**Question 12**

Which city has one of the smallest ports in Germany?

**Question 13**

What is the name of the shortest suspension bridge in Germany?

**Question 14**

How wide is the second east-west shipping lane?

**Text number 16**

From now on, the situation becomes more complicated, as the Dutch name Rijn no longer corresponds to the main flow of water. Two thirds of the Rhine flows further west, via the Waal and then via the Merwede and Nieuwe Merwede (De Biesbosch), merging with the Meuse, via the Hollands Diep and Haringvliet estuaries into the North Sea. The Beneden Merwede branches off near Hardinxveld-Giessendam and continues as the Noord River, joining the Lek River near the village of Kinderdijk to form the Nieuwe Maas River, which flows past Rotterdam via Het Scheur and the Nieuwe Waterweg to the North Sea. The Oude Maas forks near Dordrecht, and lower down it rejoins the Nieuwe Maas to form Het Scheur.

**Question 0**

What is the Dutch name for the Rhine?

**Question 1**

Where does the Rhine converge after flowing through the sea?

**Question 2**

How much of the Waal's water comes from the Rhine?

**Question 3**

Which way does two-thirds of the Rhine flow outside Germany?

**Question 4**

Where does two-thirds of the Rhine flow outside Germany?

**Question 5**

What does Rein join outside Germany?

**Question 6**

What is the name of the place where the Rhine forks near Dordrecht?

**Question 7**

How much of the Rhine flows further east?

**Question 8**

Where does two thirds of the Rhine flow within Germany?

**Question 9**

Where does the Rhine flow from?

**Question 10**

What is Dordrecht?

**Text number 17**

Another third of the water flows through the Pannerdens Kanaal and splits again into the IJssel and the Nederrijn. The IJssel branch carries one-ninth of the Rhine's flow northwards to the IJsselmeer (former bay), while the Nederrijn carries about two-ninths of the flow westwards along a route parallel to the Waal. At Wijk bij Duurstede, however, the Nederrijn changes its name to Lek. It flows further west and joins the Noord river to the Nieuwe Maas and the North Sea.

**Question 0**

If two-thirds of the Rhine flows through the Maas, where does the other third flow?

**Question 1**

Is the Rhine divided again into the Ijssel and which other water body?

**Question 2**

What name will Nederrikn change to?

**Question 3**

What's Lek got to do with it?

**Question 4**

If two-thirds of the Rhine flows through the Waal, where does the other third flow?

**Question 5**

Where else but in Ijssel is the water in the Pannerdens Kanaal red?

**Question 6**

How much of the Rhine flows through Ijssel?

**Question 7**

Where will Nederrijn change its name?

**Question 8**

Where does Nederrijn change its name?

**Question 9**

How much water flows from the Pannerdens Kanaal?

**Question 10**

Where will IJssel and Nederrijn be divided again?

**Question 11**

Where does Lek differ?

**Question 12**

How much of the River Noord flows into the North Sea?

**Question 13**

Where does Lek change its name?

**Text number 18**

The name Rijn is henceforth used only for the smaller streams further north, which together formed the main river of the Rhine in Roman times. Although the name has been preserved, these streams no longer carry water from the Rhine, but are used to drain the surrounding lands and polders. From Wijk bij Duurstede, the old northern branch of the Rhine is called the Kromme Rijn ('bent Rhine') past Utrecht, first the Leidse Rijn ('Leiden Rhine') and then the Oude Rijn ('Old Rhine'). The latter flows westwards to a lock at Katwijk, from where its waters can be discharged into the North Sea. This branch once formed the line along which the Limes Germanicus was built. During the various ice ages, when the sea level was lower, the Rhine turned to the left and formed the River Canal, whose bed is now below the English Channel.

**Question 0**

What are the names of the smaller streams in northern Germany?

**Question 1**

What are the smaller streams used for?

**Question 2**

What is the name of the old northern branch of the Rhine?

**Question 3**

What is the translation of the Old North Fork of the Rhine?

**Question 4**

Which part of the Rhine flows westwards in Katwijk?

**Question 5**

What name is used only for the larger streams further north?

**Question 6**

Which streams still carry water from the Rhine?

**Question 7**

What is the name of the old southern branch of the Rhine?

**Question 8**

When Rein turned right, what did it cause?

**Question 9**

During which periods was Limes Germanicus built?

**Text number 19**

The Rhine-Meuse estuary, the most important natural area in the Netherlands, begins near Millingen aan de Rijn, close to the Dutch-German border, where the Rhine divides into the Waal and the Nederrijn. As most of the water comes from the Rhine, the shorter name Rhine estuary is commonly used. However, this name is also used for the estuary where the Rhine flows into Lake Constance, so it is clearer to call the larger estuary the Rhine-Meuse Delta or even the Rhine-Meuse-Scheldt Delta, as the Scheldt ends in the same estuary.

**Question 0**

What is the name of the Dutch estuary?

**Question 1**

Where does Delta start in the Netherlands?

**Question 2**

What is the nickname of the Dutch Delta?

**Question 3**

What is the least important natural area in the Netherlands?

**Question 4**

What ends near Millingen aan de Rijn?

**Question 5**

What produces the least water for the region?

**Question 6**

What is another name for Lake Constance?

**Question 7**

What ends in the same delta?

**Text number 20**

The shape of the Rhine estuary is determined by two forks: firstly, at Millingen aan de Rijn, the Rhine divides into the Waal and the Pannerdens Kanaal, which changes its name to Nederrijn at Angeren, and secondly, at Arnhem, the IJssel branches off from the Nederrijn. This creates three main rivers, two of which change name quite frequently. The largest and southernmost main branch begins as the Waal and continues as the Boven Merwede ('Upper Merwede'), Beneden Merwede ('Lower Merwede'), Noord River ('Northern River'), Nieuwe Maas ('New Meuse'), Het Scheur ('Rip') and Nieuwe Waterweg ('New Waterway'). The central river starts as Nederrijn, then becomes Lek and joins the Noord to form the Nieuwe Maas. The northern flow keeps its name IJssel until it flows into Lake IJsselmeer. Three other streams carry significant volumes of water: the Nieuwe Merwede ('New Merwede'), which branches off the South Fork where it changes from the Boven to the Beneden Merwede; the Oude Maas ('Old Maas'), which branches off the South Fork where it changes from the Beneden Merwede to the Noord; and the Dordtse Kil, which branches off the Oude Maas.

**Question 0**

At Millingen aan de Rijn, where the Rhine forks, why does it change its name?

**Question 1**

How many main rivers branch off from Nederrijn?

**Question 2**

What is the main branch of the Rhine?

**Question 3**

What is the English translation of Het Scheur?

**Question 4**

What is the translation of Oude Maas?

**Question 5**

The southern flow retains its name IJssel until it flows to where?

**Question 6**

Where does the Merwede branch off from the northern branch of the Benede Merwede?

**Question 7**

What is the smallest and northernmost main branch?

**Question 8**

How many other streams carry insignificant amounts of water?

**Text number 21**

Before the St Elizabeth Flood (1421), the Maas flowed just south of the present Merwede-Oude Maas line into the North Sea, forming an archipelagic estuary with the Waal and the Lek. This system of numerous bays, large estuary-like rivers, many islands and constant coastal changes is difficult to imagine today. Between 1421 and 1904, the Meuse and the Waal joined upstream at Gorinchem to form the Merwede. For flood control reasons, the Meuse was separated from the Waal by a lock and diverted to a new estuary called the Bergse Maas, before flowing into the Amer and then into the former Hollands Diep Bay.

**Question 0**

Which flood affected the Meuse River?

**Question 1**

What year was the flood that affected the Maas River?

**Question 2**

Where did the Maas flow before the flood?

**Question 3**

What did Merwede-Oude Maas form with Waal and Lek?

**Question 4**

When did Meuse and Waal merge?

**Question 5**

When did the Maas and Waal part upstream at Gorinchem?

**Question 6**

In what year was Saint Elizabeth born?

**Question 7**

In what year did St Elizabeth flood part of the North Sea?

**Question 8**

What flows out of the former Hollands Diep in the Bay?

**Question 9**

For what year did St Elizabeth live in Hollands Diep Bay?

**Text number 22**

The hydrography of the current estuary is characterised by main branches, separate branches (Hollandse IJssel, Linge, Vecht, etc.) and smaller rivers and streams. Many rivers have been closed ('dammed') and now serve as drainage channels for numerous polders. The construction of the Delta Works fundamentally changed the estuary in the second half of the 20th century. Today, the waters of the Rhine flow into the sea or into former sea lochs, now separated from the sea, in five places, namely at the mouths of the Nieuwe Merwede, Nieuwe Waterway (Nieuwe Maas), Dordtse Kil, Spui and IJssel.

**Question 0**

What is the term for closing rivers that are no longer connected?

**Question 1**

What are closed rivers used for once they are closed?

**Question 2**

What changed the Rhine Delta?

**Question 3**

When did the Rhine estuary change?

**Question 4**

What is typical of the hydrography of the former estuary?

**Question 5**

What changed the Delta in the first half of the 20th century?

**Question 6**

In which century did the gulfs join the sea?

**Question 7**

What water flows from the sea and the former sea bay?

**Text number 23**

The Rhine-Meuse estuary is a tidal delta, shaped not only by river sedimentation but also by tidal flows. This meant that high tides posed a serious risk, as strong tidal currents could tear up huge areas of land into the sea. Before the construction of the Delta Works, the tidal influence was felt as far inland as Nijmegen, and even today, after the Delta Works regulatory measures, the tides still have an impact far inland. In the Waal, for example, the tidal effect is at its greatest inland between Brakel and Zaltbommel.

**Question 0**

What is the Rhine-Meuse estuary like?

**Question 1**

In addition to rivers, what shapes river sedimentation?

**Question 2**

What is the risk of high tides near land?

**Question 3**

Between Brakel and which other city is the most landward tidal influence observed?

**Question 4**

What was not shaped by river sedimentation and tidal flows?

**Question 5**

Between which area was Delta Works built?

**Question 6**

What can weak tidal currents do?

**Question 7**

What produces a lot of sedimentation that flows into the surrounding rivers?

**Text number 24**

In southern Europe, the phases were created during the Mesozoic Triassic, when the Tethys Ocean opened between the Eurasian and African continental plates between about 240 MBP and 220 MBP (one million years before present). The present-day Mediterranean Sea descends from this slightly larger Tethys Sea. At about 180 MBP, in the Jurassic, the two plates reversed direction and began to squeeze the Tethys seafloor, causing it to sink beneath Eurasia and push the edge of the latter plate upwards in the Alpine Gulf, which occurred in the Oligocene and Miocene epochs. Several microplates were compressed and rotated or thrust laterally, giving rise to individual features of Mediterranean geography: the Iberian thrust into the Pyrenees, Italy, the Alps and Anatolia, moving westwards to the Greek mountains and islands. Compression and orogeny continue today, as evidenced by the continued uplift of mountains a little every year and active volcanoes.

**Question 0**

From which sea does the current Mediterranean Sea flow?

**Question 1**

Which period opened the Tethys Ocean?

**Question 2**

At what point in time did the slabs reverse direction and the Tethys layer compress?

**Question 3**

The squeezing and spinning of microplates created the properties of what?

**Question 4**

What pushed the Pyrenees up?

**Question 5**

What period closed the Tethys Ocean?

**Question 6**

During which period was southern Europe discovered?

**Question 7**

When did the yoga season end?

**Question 8**

During which period was the Tethys layer discovered?

**Question 9**

Between which years did the Mediterranean flow into the Sea of Tethys?

**Text number 25**

The Alpine orogeny since the Eocene caused the development of the N-S-luode rift system in this zone. The main parts of this rift are the upper Rhine depression in south-western Germany and eastern France and the lower Rhine in north-western Germany and south-eastern Netherlands. By the Miocene, a river system had developed in the Upper Rhine basin, which continued northwards and is considered to be the first Rhine river. At that time, it did not yet carry the discharges from the Alps, but the Rhône and Danube catchments drained the northern sides of the Alps.

**Question 0**

Which rift system developed during the Alpine orogeny?

**Question 1**

What elements of the Alpine orogenic rift system are found in south-western Germany?

**Question 2**

At what time did the river system develop in the Upper Rhine Graben area?

**Question 3**

The Rhine and what other river drained the northern slopes of the Alps?

**Question 4**

What dried up the southern slopes of the Alps?

**Question 5**

Which continued south and is also considered to be the first Rhine River?

**Question 6**

What caused the ongoing Alpine orogeny before the Eocene?

**Question 7**

During which period did the Alpine orogeny end?

**Text number 26**

The Rhine extended its catchment area southwards through the capture of streams. By the Pliocene, the Rhine had captured streams as far as the Vosges mountains, including the Moselle, Main and Neckar. The Rhone then drained the northern Alps. By the beginning of the Pleistocene, the Rhine had captured most of its present Alpine catchment area from the Rhône, including the Aar. Since then, the Rhine has added to its catchment area the waters above Lake Constance (Vorderrhein, Hinterrhein, Alpenrhein; taken from the Rhône), the upper reaches of the Main after Schweinfurt and the Vosges Mountains, taken from the Meuse.

**Question 0**

How did the Rhine extend the river basin southwards?

**Question 1**

At what time did Rein hijack the power?

**Question 2**

Where are the streams of the Rhine captured?

**Question 3**

What made the Rhine expand its catchment area northwards?

**Question 4**

When did Rein take over the Vogees?

**Question 5**

What floods the northern Alps?

**Question 6**

What captured the Vogees?

**Question 7**

Which mountain region includes Lake Constance?

**Text number 27**

About 2.5 million years ago (ending 11 600 years ago) was the geological period of the Ice Age. Since about 600 000 years ago, there have been six major ice ages, during which sea levels fell by 120 metres and much of the continental shelf was exposed. During the Early Pleistocene, the Rhine ran north-west through what is now the North Sea. During the so-called Anglian Ice Age (~450 000 years BP, marine oxygen isotope phase 12), ice blocked the northern part of the present North Sea, creating a large lake that flowed through the English Channel. This caused the Rhine to change its course through the English Channel. Since then, the river's mouth was located off Brest in France during the Ice Age, and rivers such as the Thames and Seine became tributaries of the Rhine. In the interglacial period, as sea levels rose to about the present level, the Rhine formed deltas in what is now the Netherlands.

**Question 0**

What period was 2.5 million years ago?

**Question 1**

How many major ice ages have there been?

**Question 2**

How much did sea levels fall during the ice ages?

**Question 3**

In which direction did the Rhine flow at the beginning of the Pleistocene?

**Question 4**

Where was the mouth of the Rhine during the Ice Age?

**Question 5**

How long did the ice ages last?

**Question 6**

How high did sea levels rise during the ice ages?

**Question 7**

When did the Rhine fall south-west into the North Sea?

**Question 8**

In which country is the English Channel located?

**Text number 28**

The Last Glacial Period lasted from about 74 000 years BP (before present) to the end of the Pleistocene (about 11 600 BP). In north-western Europe, there were two very cold phases, with peaks at about 70 000 BP and about 29 000-24 000 BP. The last phase occurred shortly before the global Last Glacial Maximum. During this period, the lower reaches of the Rhine flowed roughly westwards through the Netherlands and extended south-westwards through the English Channel and eventually into the Atlantic Ocean. The English Channel, the Irish Channel and most of the North Sea were dry land, mainly because sea level was about 120 metres lower than today.

**Question 0**

When did the last ice age start?

**Question 1**

When did the last ice age end?

**Question 2**

Which way did the Rhine flow during the last cold phase?

**Question 3**

How much lower was the North Sea during the last cold spell than it is now?

**Question 4**

Besides the North Sea and the Irish Channel, what else was counted during the last cold snap?

**Question 5**

When did the Pleistocene begin?

**Question 6**

When did the last ice age peak?

**Question 7**

Where does the Atlantic Ocean flow?

**Question 8**

What is the sea level of the Irish Channel?

**Question 9**

What is the sea level of the English Channel?

**Text number 29**

Most of the Rhine's current course was not under ice during the last ice age, but its source must still have been a glacier. The glacial tundra, with its flora and fauna, stretched across central Europe from Asia to the Atlantic Ocean. This was the case during the maximum of the last ice age, around 22 000-14 000 years BC, when ice sheets covered Scandinavia, the Baltic, Scotland and the Alps, but left open tundra in between. Loess, or wind-blown dust, settled in and around the Rhine Valley, contributing to its current agricultural use.

**Question 0**

What was the source of the Rhine in the last Ice Age?

**Question 1**

What stretched across central Europe during the last Ice Age?

**Question 2**

When was the last ice age maximum?

**Question 3**

What covered Scandinavia, the Baltics, Scotland and the Alps during the last Ice Age?

**Question 4**

What is the term for wind-blown dust on tundra?

**Question 5**

What was the source of the Rhine during the current last Ice Age?

**Question 6**

What flowed through the tundra?

**Question 7**

When did ice sheets cover Asia?

**Question 8**

When were the Alps formed?

**Text number 30**

As north-western Europe slowly began to warm 22 000 years ago, the frozen ground and expanded alpine glaciers began to melt and the autumn and winter snow cover melted in spring. Much of the discharged water was diverted to the Rhine and its lower reaches. Rapid warming and conversion of vegetation to open forest began around 13 000 BP. By 9000 BP, Europe was completely forested. As the ice sheet retreated worldwide, sea levels rose and the English Channel and the North Sea flooded again. The melt waters, which added to the subsidence of the sea and land, transgressively drowned the former coasts of Europe.

**Question 0**

When did Europe slowly start to warm up after the last ice age?

**Question 1**

What did the frozen ground and expanded alpine glaciers start to do?

**Question 2**

Where did glacial run-off go in Europe during the last ice age?

**Question 3**

When did the rapid warming start and helped the vegetation?

**Question 4**

When was Europe fully reforested and recovered from the last Ice Age?

**Question 5**

How many years did it take for the frozen ground to warm up?

**Question 6**

How many years did it take before the spring snows melted?

**Question 7**

What did Rein help to expand?

**Question 8**

What revealed the former coasts of Europe?

**Text number 31**

Since 7,500 years ago, the tides and flows have been very similar to the current situation. The rate of sea-level rise had fallen so much that the natural sedimentation of the Rhine and the coastline combined to compensate for the sea shift; for the last 7000 years, the coastline was roughly in the same place. In the southern part of the North Sea, sea level continues to rise by about 1-3 cm per century (1 metre or 39 inches over the last 3000 years) due to ongoing tectonic subsidence.

**Question 0**

When did tides and currents like the current system start?

**Question 1**

Why does the natural sedimentation of the Rhine compensate for the marine drift?

**Question 2**

How long has the shoreline of the Rhine been in the same place?

**Question 3**

Why is the current sea level rising?

**Question 4**

How fast is sea level rising?

**Question 5**

When was the highest sea level rise caused by tides and currents?

**Question 6**

How fast is sea level falling?

**Question 7**

How long has the tectonic subsidence of the southern North Sea continued?

**Question 8**

How much natural sedimentation is there on the Rhine?

**Question 9**

How old is the North Sea?

**Text number 32**

At the beginning of the Holocene (around 11 700 years ago), the Rhine was located in its late glacial valley. As a meandering river, it shaped the glacial bed. As sea levels continued to rise in the Netherlands, the Rhine-Meuse estuary of the Holocene began to form (around 8 000 years ago). Simultaneous absolute sea-level rise and tectonic subsidence have strongly influenced the development of the estuary. Other important factors influencing the shape of the estuary are the local tectonic activity of the Peel Boundary Fault, subsoil and geomorphology inherited from the last glacial period, and coastal and marine dynamics such as the formation of barrier and tidal inlets.

**Question 0**

When was the Holocene?

**Question 1**

Where was the Rhine located during the Holocene?

**Question 2**

In which country did the Rhine continue to rise during the Holocene?

**Question 3**

When did the formation of the Holocene Rein-Maas Park begin?

**Question 4**

When did my holodeck end?

**Question 5**

When did the Holocene-era Rein-Maas Park cease to form?

**Question 6**

When was the Peel Boundary Fault discovered?

**Question 7**

When did the Netherlands begin to occupy the late valley?

**Text number 33**

Human influence in the delta has been visible for about 3000 years after BP (= years before present). As a result of increased land clearing (Bronze Age agriculture) in mountainous areas (central Germany), the sediment load of the Rhine has increased dramatically and the growth of the estuary has accelerated. This caused increased flooding and sedimentation, which stopped peat formation in the estuary. The shifting of river beds to new locations on the floodplain (so-called avulsion) was the main process that distributed sediment throughout the subrecent delta. About 80 avulsions have occurred in the last 6000 years. Direct human impact on the delta began with peat extraction for salt and fuel production from Roman times onwards. This was followed by the damming of the major rivers and the damming of the smaller rivers from the 11th to 13th centuries AD. Then channels were dug, bends were straightened and groynes were built to prevent the river channels from shifting or silting up.

**Question 0**

When did humans start to affect the estuary?

**Question 1**

What increased in the Rhine when the upland areas were cleared?

**Question 2**

What has sedimentation and estuary growth caused in the Rhine?

**Question 3**

How many avulsions have occurred in the last 6000 years?

**Question 4**

When did the damming of the major tributaries of the Rhine start?

**Question 5**

How long has man been affecting the estuary?

**Question 6**

How many years did Bronze Age agriculture continue?

**Question 7**

How many mountain areas are there in central Germany?

**Question 8**

How long did peat extraction take in Roman times?

**Question 9**

In which century did the Roman period take place?

**Text number 34**

Today, the Waal and Nederrijn-Lek branches discharge into the North Sea via the former Meuse estuary near Rotterdam. The IJssel branch flows north and discharges into the IJsselmeer, which is a former brackish lagoon of the Zuider Zee, but since 1932 a freshwater lake. The discharge of the Rhine is divided into three branches: the River Waal (6/9 of the total discharge), the Nederrijn - Lek (2/9 of the total discharge) and the IJssel (1/9 of the total discharge). This discharge distribution has been maintained since 1709 by river engineering works, such as the excavation of the Pannerdens canal, and since the 20th century by the Nederrijn dams.

**Question 0**

Where do the Waal and Nederrijn-Lek branches lead to?

**Question 1**

What does the eruption of Waal and Nederrijn-Lek mean?

**Question 2**

Where does the Ijssel branch flow?

**Question 3**

Where did Zuider Zee's breakwater lagoon go?

**Question 4**

How many branches does the Rhine have?

**Question 5**

Where does the North Sea discharge?

**Question 6**

When was Zuider Zee's brackish water lagoon discovered?

**Question 7**

In what year was the digging of the Pannerdens canal stopped?

**Question 8**

How many branches does the Zuider Zee brackish water lagoon have?

**Question 9**

In which century did the North Sea discharge into the Nederrijn River?

**Text number 35**

Herodotus was not familiar with Rhine, and it first appears in historical time in the 1st century BC in Roman geography. At that time it formed the border between Gaul and Germania. The Upper Rhine had been part of the late Hallstatt culture since the 6th century BC, and in the 1st century BC it was part of the Roman Empire. The La Tène area covered almost its entire length and formed a contact zone with the Jastorf culture, the site of early Celtic-Germanic cultural contact. In Roman geography, the Rhine was by definition the boundary between Gaul and Germania; e.g. Maurus Servius Honoratus, Commentary on the Aeneid of Vergil (8.727) (Rhenus) fluvius Galliae, qui Germanos a Gallia dividit "(the Rhine is) the river of Gaul, which separates the Germanic peoples from Gaul."

**Question 0**

When was the Rhine first discovered?

**Question 1**

Rhine first formed the border between Gaul and which other region?

**Question 2**

Since when has the Rhine been part of the Hallstatt cultural area?

**Question 3**

Who first wrote about the discovery of the Rhine and the border?

**Question 4**

When did Herodotus discover the Rhine?

**Question 5**

Between which border did Herodotus travel?

**Question 6**

In which century was the Hallstatt culture discovered?

**Question 7**

In which century did Maurus Servius Honoratus give Herodotus his commentary on Virgil's Aeneid?

**Text number 36**

From the death of Augustus in 14 AD until after 70 AD, Rome accepted as its Germanic frontier the waters of the Rhine and the upper Danube. Outside these rivers, Rome held only the fertile plain of Frankfurt, opposite the Roman frontier fortress of Moguntiacum (Mainz), the southernmost slopes of the Black Forest and a few scattered bridgeheads. The northern part of this frontier, where the Rhine is deep and wide, remained the Roman frontier until the fall of the Empire. The southern part was different. The upper reaches of the Rhine and the Danube are easily crossed. The border they form is uncomfortably long, enclosing a sharply angled wedge of foreign territory between present-day Baden and Württemberg. The Germanic population of these areas seems to have been small in Roman times, and Roman subjects from what is now Alsace-Lorraine had drifted eastwards across the river.

**Question 0**

When did Augustus die?

**Question 1**

The Rhine and which other river was accepted as the Germanic border?

**Question 2**

When did the Rhine cease to be the Roman border?

**Question 3**

Where do the upper reaches of the Rhine and Danube cross?

**Question 4**

In which direction did the Romans drift through the Rhine?

**Question 5**

When did Augustus discover Rome?

**Question 6**

What did the Romans consider to be the only fertile plain?

**Question 7**

When was the Black Forest discovered?

**Question 8**

When did the Roman Empire fall?

**Question 9**

Which population groups inhabited the foreign territory between present-day Baden and Württemberg?

**Text number 37**

The Romans kept eight legions in five bases along the Rhine. The actual number of legions at any or all of these bases depended on whether there was a war situation or a threat of war. Around 14-180 AD. the distribution of legions was as follows: Germania Inferior's army, two legions at Vetera (Xanten), I Germanica and XX Valeria (Pannonian troops); two legions at Oppidum Ubiorum ("City of Ubius"), renamed Colonia Agrippina, which landed at Cologne, V Alaudae, a Celtic legion recruited from Gallia Narbonensis, and XXI, possibly a Galatian legion from the other side of the empire.

**Question 0**

How many legions in five bases did the Romans have along the Rhine?

**Question 1**

What did the number of legions depend on in Roman times?

**Question 2**

Vetra and I Germanica and XX Valeria were two legions for what?

**Question 3**

What was the original name of Colonia Agrippina?

**Question 4**

What does the original name of Colonia Agrippina mean in Finnish?

**Question 5**

How many wars did the Romans fight along the Rhine?

**Question 6**

When was the first Roman war?

**Question 7**

How many legions did Germania Inferior have?

**Question 8**

To which legion did the Romans come from the other side of the empire?

**Question 9**

With whom were the Pannonian troops allied?

**Text number 38**

Germanic tribes crossed the Rhine during the Migration Period, and in the 5th century they established the kingdoms of France downstream, Burgundy upstream and Alemannia upstream. This 'Germanic heroic age' is reflected in medieval legends, such as the Nibelungen, which tells of the hero Siegfried slaying the dragon on the Drachenfels (Siebengebirge) ('Dragon Rock') near Bonn on the Rhine, and of the Burgundians and their court at Worms on the Rhine, and of Kriemhild's treasure of gold thrown into the Rhine by Hagen.

**Question 0**

When did Germanic tribes cross the Rhine to migrate?

**Question 1**

What did the Germanic tribes establish with the help of the Rhine?

**Question 2**

What is the Siebengebirge translation?

**Question 3**

Who is the hero who killed the dragon in Drachenfels?

**Question 4**

Who, according to legend, threw gold into the Rhine?

**Question 5**

When did the "Germanic heroic era" end?

**Question 6**

What did Hagen find after being thrown into the river?

**Question 7**

What kind of stone did the hero Siegfried find?

**Question 8**

Where did the hero Siegfried find the stone?

**Question 9**

Who threw Hagen into the river?

**Text number 39**

By the sixth century, the Rhine was already within France's borders. In the ninth century it formed part of the border between central and western France, but by the tenth century it was entirely within the territory of the Holy Roman Empire, flowing through Swabia, Franconia and Lower Lorraine. The mouth of the Rhine in the Dutch county was part of the Burgundian Netherlands in the 15th century; the Netherlands remained a disputed territory during the Wars of Religion in Europe and the collapse of the Holy Roman Empire, when the length of the Rhine belonged to the First French Empire and its client states. The Austrian Archduke Sigismund sold Alsace on the left bank of the Rhine to Burgundy in 1469, which eventually fell to France in the Thirty Years' War. The numerous historic castles of Rhineland-Palatinate bear witness to the river's importance as a trade route.

**Question 0**

When did the Rhine become the French border?

**Question 1**

When did the Rhine belong entirely to the Holy Roman Empire?

**Question 2**

In the 10th century, the Rhine flowed through Swabia, Franconia and what other place?

**Question 3**

Who sold the upper Rhine to Burgundy?

**Question 4**

When was the upper Rhine sold to Burgundy?

**Question 5**

When did France realise that Rein had come within its borders?

**Question 6**

When were central and western France formed?

**Question 7**

When was the Dutch kingdom formed?

**Question 8**

When did Archduke Sigismund of Austria die?

**Question 9**

What was the name of the war started by the Austrian Archduke Sigismund?

**Text number 40**

Since the Peace of Westphalia, the upper Rhine was a disputed border between France and Germany. The creation of "natural borders" on the Rhine was a long-standing objective of French foreign policy since the Middle Ages, although the language border was - and is - much further west. French leaders such as Louis XIV and Napoleon Bonaparte tried, with varying degrees of success, to annex countries west of the Rhine. Napoleon established the Rhine Federation as a client state of France in 1806, and it lasted until 1814, when it became a major source of resources and military manpower for the First French Empire. In 1840, the Rhine crisis, caused by French Prime Minister Adolphe Thiers' desire to restore the Rhine as a natural frontier, led to a diplomatic crisis and a wave of nationalism in Germany.

**Question 0**

What was the name of the period when the Upper Rhine formed the border between France and Germany?

**Question 1**

What was the long-term objective of French foreign policy along the Rhine?

**Question 2**

Who founded the Rhine Confederation?

**Question 3**

When was the Union of the Rhine?

**Question 4**

When was the Rhine crisis?

**Question 5**

What was the name of the period of peace between France and Germany?

**Question 6**

What borders did the French complete in the Middle Ages?

**Question 7**

When was the Peace of Westphalia signed?

**Question 8**

How long did the peace in Westphalia last?

**Question 9**

When did Napoleon die?

**Text number 41**

After the end of the First World War, the Rhineland was covered by the Treaty of Versailles. It stipulated that the Allies would occupy it until 1935, after which it would be a demilitarised zone where the German army would not be allowed to enter. The Treaty of Versailles and this particular provision caused a great deal of resentment in Germany and is often credited with helping Adolf Hitler's rise to power. The Allies left the Rhineland in 1930 and the German army reoccupied it in 1936, which was very popular in Germany. Although the Allies could probably have prevented the re-occupation, Britain and France were reluctant to do so, as part of their policy of appeasement of Hitler.

**Question 0**

When did the Treaty of Versailles apply to the Rhineland?

**Question 1**

When will the Allied occupation of the Rhineland be lifted?

**Question 2**

Who would be denied access to the Rhine region after 1935?

**Question 3**

What do some people think the Treaty of Versailles helped?

**Question 4**

When did the German army re-occupy the Rhineland?

**Question 5**

When was the Treaty of Versailles written?

**Question 6**

When did the German army arrive in the Rhineland?

**Question 7**

In what year did Adolf Hitler come to power?

**Question 8**

When did the German army re-occupy Britain and France?

**Text number 42**

During the Second World War, it was recognised that the Rhine would be a formidable natural barrier to a Western Allied invasion of Germany. The Arnhem Bridge over the Rhine, immortalised in the book A Bridge Too Far and in the film, was the focus of the Battle of Arnhem during the failed Market Garden operation in September 1944. The bridges over the River Waal on the Rhine in Nijmegen were also the target of Operation Market Garden. In a separate operation, the Ludendorff Bridge over the Rhine at Remagen became famous when American troops managed to capture it intact - to their surprise - after the Germans failed to dismantle it. It was also the subject of a film, The Bridge at Remagen. Seven Days on the Rhine was the Warsaw Pact's war plan to invade Western Europe during the Cold War.

**Question 0**

Where is the bridge over the Rhine?

**Question 1**

What was Rhine to the invaders of the Second World War?

**Question 2**

When was Operation Market Garden implemented?

**Question 3**

Which bridge did the Germans fail to demolish?

**Question 4**

What was the Warsaw Pact war plan?

**Question 5**

During which war did the Western Allies cross the Rhine Bridge in Arnhem?

**Question 6**

When did the September Market Garden operation end?

**Question 7**

When did the Cold War start?

**Question 8**

How long did the Cold War last?

**Question 9**

How many days did US troops participate in the Cold War?

**Text number 43**

Until 1932, the generally accepted length of the Rhine was 1 230 kilometres (764 miles). In 1932, the German encyclopaedia Knaurs Lexikon gave the length as 1 320 kilometres (820 miles), which was probably a clerical error. After its inclusion in the authoritative Brockhaus Enzyklopädie, this figure was widely accepted and found its way into numerous textbooks and official publications. The error was discovered in 2010, and the Dutch Rijkswaterstaat confirmed the length as 1,232 kilometres (766 miles)[note 1].[note 1].

**Question 0**

What was the accepted length of the Rhine before 1932?

**Question 1**

Who reported the change in the length of the Rhine?

**Question 2**

In 1932, what was the measurement of the Rhine changed to?

**Question 3**

Why was the Rhine measurement changed?

**Question 4**

When was the Rhine measurement corrected back to the original?

**Question 5**

In what year was the German encyclopaedia Knaurs Lexicon written?

**Question 6**

In what year was the typo first corrected?

**Question 7**

In what year was the Dutch Rijkswaterstaat founded?

**Question 8**

When was the authoritative Brockhaus Encyclopaedia written?

**Question 9**

How wide is the Rhine?