

The uterus (womb) is part of the reproductive system in mammals.

Name one function of the uterus.

Which of the following can provide the human body with long-term immunity against some diseases?

- A. antibiotics
- B. vitamins
- C. vaccines
- D. red blood cells

Diagram 1

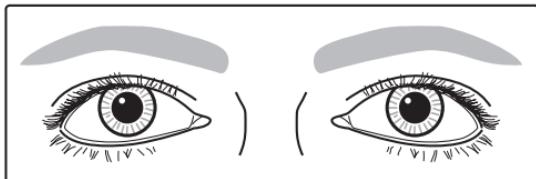
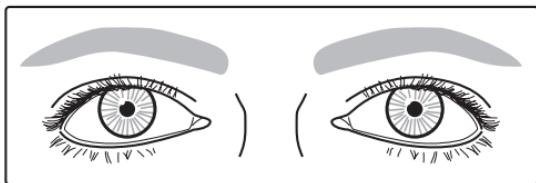
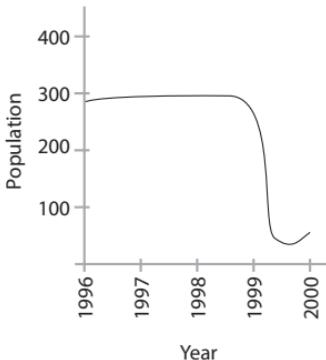


Diagram 2



Diagrams 1 and 2 illustrate the same pair of eyes that have reacted to a change in an environmental condition.

What is the environmental condition and how is it different for the eyes in Diagram 1 and Diagram 2?



The graph indicates the number of antelopes in a certain area over a period of time. Which of the following factors is most likely to have caused the sudden change in population between 1999 and 2000?

- A. global warming
- B. absence of predators
- C. depletion of the ozone layer
- D. brush fires that destroyed the food supply

Some birds eat snails. A species of snail that lives in the forest has a dark shell. The same species of snail that lives in a field has a light-colored shell. Explain how this difference in shell colors helps the snails to survive.

Bacteria that enter the body are destroyed by which type of cells?

- A. white blood cells
- B. red blood cells
- C. kidney cells
- D. lung cells

In a lake near a farm the growth of algae suddenly increased. This increase was most likely due to which of the following?

- A. a decrease in air temperature
- B. a decrease in water level
- C. fertilizer runoff from the farm
- D. exhaust gases from farm equipment

Many seeds can germinate in the light or in the dark.

State two conditions necessary for germination.

1.

2.

The following table shows the classification of some animals into two categories.

Category 1	Category 2
rabbit	frog
giraffe	spider
elephant	lion

Which of the following was used to classify these animals?

- A. organs used in breathing
- B. food source
- C. method of reproduction
- D. pattern of movement

Which of the following best describes the purpose of cellular respiration?

- A. to provide energy for cell activities
- B. to produce sugar for storage in cells
- C. to release oxygen for breathing
- D. to supply carbon dioxide for photosynthesis

Kidneys are organs found in the human body. When he was young, a man had one of his two kidneys removed because it was diseased. He now has a son.

- A. How many kidneys did his son have at birth? _____
- B. Explain your answer.

State one reason why exercise is important for good health.

Which of the following statements is true about organisms that are producers?

- A. They use energy from the sun to make food.
- B. They absorb energy from a host animal.
- C. They get energy from eating living plants.
- D. They get energy by breaking down dead plants and animals.

There are more than 6 billion people in the world who share the world's natural resources. Look at the table below. It shows some information for two fictitious countries (1 and 2).

	Country 1	Country 2
Population (millions)	200	500
Annual birth rate (births per 1000 people)	10	40
Annual death rate (deaths per 1000 people)	10	10
Area in square kilometers	2,000,000	2,000,000
Grain production (percentage of world total)	40%	20%
Oil consumption (percentage of world total)	20%	5%

A. Based on the information given in the table, predict how the population of each country will change over the next ten years.
(Check one box in each row.)

Population Will Increase	Population Will Decrease	Population Will Stay the Same
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Country 1

Country 2

There are more than 6 billion people in the world who share the world's natural resources. Look at the table below. It shows some information for two fictitious countries (1 and 2).

	Country 1	Country 2
Population (millions)	200	500
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Area in square kilometers	2,000,000	2,000,000
Grain production (percentage of world total)	40%	20%
Oil consumption (percentage of world total)	20%	5%

- B. Predict how the population of the two countries will affect each of the following environmental factors over the next ten years.

Land Use:

There are more than 6 billion people in the world who share the world's natural resources. Look at the table below. It shows some information for two fictitious countries (1 and 2).

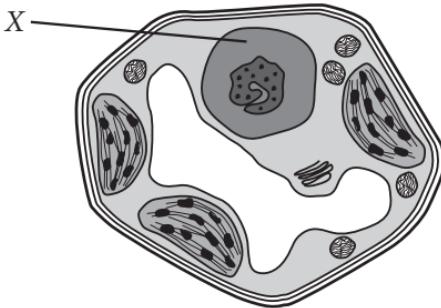
	Country 1	Country 2
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Oil consumption (percentage of world total)	20%	5%

- B. Predict how the population of the two countries will affect each of the following environmental factors over the next ten years.

Pollution:

Which organ in a frog has a function similar to the function of lungs in a bird?

- A. kidney
- B. skin
- C. liver
- D. heart



The diagram shows a plant cell.

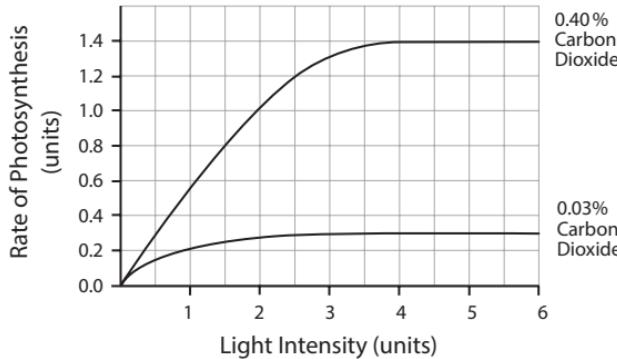
What is the function of the part of the cell labeled X?

- A. It stores water.
- B. It makes food.
- C. It absorbs energy.
- D. It controls activities.

Andrea is investigating the effects of light intensity and carbon dioxide concentration on the rate of photosynthesis.

She measured the rate of photosynthesis at different light intensities for two identical plants. The plants were placed in closed containers. One container had an initial carbon dioxide concentration of 0.40%. The other container had an initial carbon dioxide concentration of 0.03%.

She plotted her results as shown below.



Look at the graph.

- A. Does an increase in carbon dioxide concentration affect the rate of photosynthesis?

(Check one box.)

- Yes
 No

- B. Explain your answer.

Which equation summarizes the process of respiration?

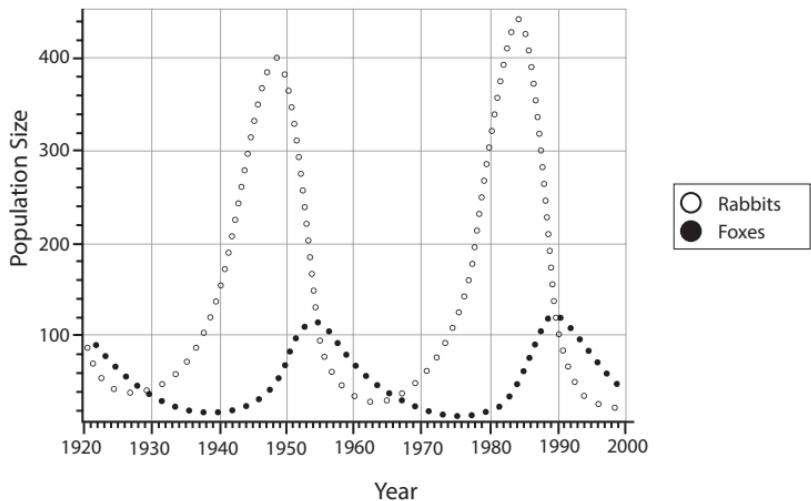
- A. water + carbon dioxide + energy \rightarrow sugar + oxygen
- B. oxygen + sugar \rightarrow carbon dioxide + water + energy
- C. carbon dioxide + oxygen + water \rightarrow sugar + energy
- D. sugar + carbon dioxide + energy \rightarrow oxygen + water

Where did organisms live when they first appeared on Earth?

- A. in the water
- B. in the air
- C. on the land
- D. under the ground

A population of rabbits and foxes live in a remote area. The foxes do not have any predators.

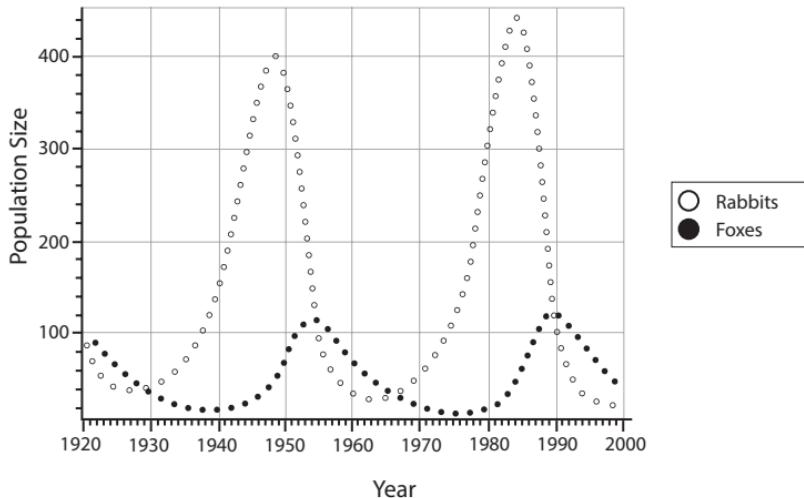
Scientists counted the number of rabbits and foxes over a long time period and plotted their results, as shown below.



- A. In which year was the population of rabbits at its highest?

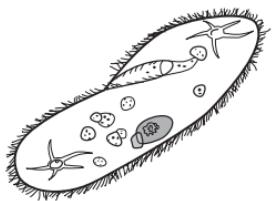
A population of rabbits and foxes live in a remote area. The foxes do not have any predators.

Scientists counted the number of rabbits and foxes over a long time period and plotted their results, as shown below.



- B. Describe how the changes in population size of rabbits and foxes are related.

The diagram shows a single-celled organism called a *Paramecium*.



In order to survive, the *Paramecium* carries out certain life functions, such as taking in nutrients to produce energy.

State one other life function that the *Paramecium* must carry out in order to survive.

Kayra and Emre are studying plants. They have learned that characteristics such as the height of plants and the color of fruit are inherited.

They are looking at some green and red peppers.



green peppers



red peppers

Kayra thinks they are different kinds of peppers, because they are different colors.

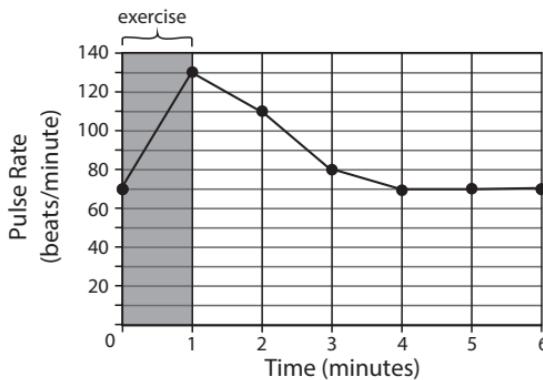
Emre thinks that they are the same type of pepper, and red peppers are red because they have been left on the plant longer and have ripened.

Describe how you could set up an investigation to decide whether Kayra or Emre is correct.

A farmer planted a field of corn. Weeds started to grow among the seedlings.

Explain why it is important that he remove the weeds.

John measures his pulse rate before he exercises. It is 70 beats per minute. He exercises for one minute and measures his pulse rate again. He then measures it every minute for several minutes. He draws a graph to show his results.



What can be concluded from his results?

- A. His pulse rate increased by 50 beats per minute.
- B. His pulse rate took less time to slow down than to increase.
- C. His pulse rate after 4 minutes was 80 beats per minute.
- D. His pulse rate returned to normal in less than 6 minutes.

Susie has a potted plant. She sets up an experiment that shows that water travels through a plant into the air.



Which experiment would show this?

- A. Put water in a container under the pot; water will disappear from the container.
- B. Cover one of the stems of the plant with a plastic bag and water the plant; drops of water will be seen in the bag.
- C. Place a cut stem from the plant in a plastic bag; water will be seen in the bag.
- D. Place a cut stem from the plant in a glass of colored water; the plant's leaves will change color.

John has diabetes.

Which of the following should he be careful about eating or drinking?

- A. beef
- B. eggs
- C. milk
- D. fruit juice

The diagram below shows geological layers of rock containing fossils. Layer F is the uppermost layer, while Layer A is the deepest layer.



Which statement about the age of the fossils is most likely correct?

- A. Fossils in Layer A are the oldest, because they are located in the deepest layer.
- B. Fossils in Layer C are the youngest, because they look similar to existing organisms.
- C. Fossils in Layer D are older than fossils in Layer A, because the fossils in Layer D are bigger.
- D. Fossils in Layer E are the same age as those in Layer F because they look the same.

The amount of carbon dioxide in the air is increasing in a large city due to the growing number of vehicles. The mayor wants to plant more trees.

A. Do you agree with the mayor's suggestion?

(Check one box.)

Yes

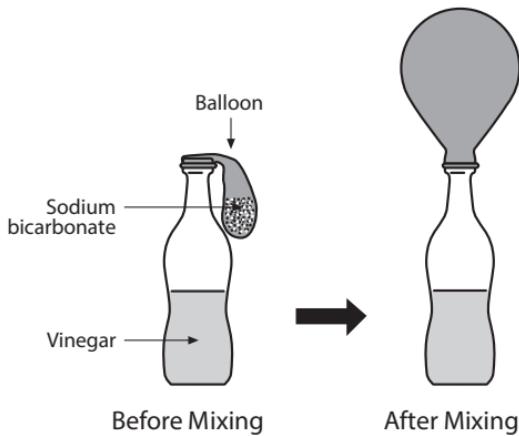
No

B. Explain your answer.

Twins are born. One is a boy and one is a girl.

Which statement is correct about their genetic makeup?

- A. The boy and the girl inherit genetic material from the father only.
- B. The boy and girl inherit genetic material from the mother only.
- C. The boy and girl inherit genetic material from both parents.
- D. The boy inherits genetic material from the father only and the girl inherits it from the mother only.



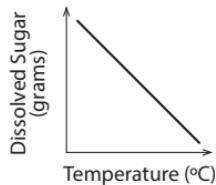
As shown in the diagram, the balloon inflates when the sodium bicarbonate in the balloon is mixed with the vinegar.

What causes this to happen?

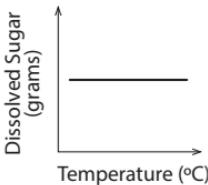
Bob did an experiment to investigate the effect of temperature on the solubility of sugar in water by measuring the amount of sugar that would dissolve in 1 liter of water at different temperatures. He then plotted his results.

Which of the following is likely to be the graph showing Bob's results?

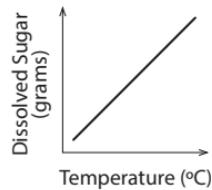
A.



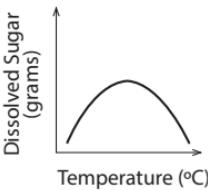
B.



C.

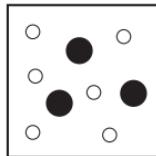


D.

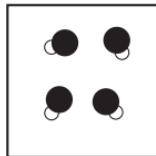


In the diagrams below, hydrogen atoms are represented by white circles, and oxygen atoms are represented by black circles.

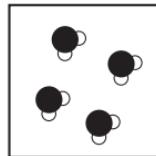
Which of the diagrams best represents water?



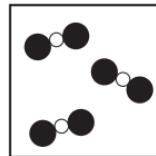
A.



B.



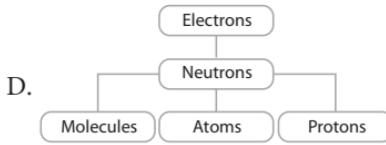
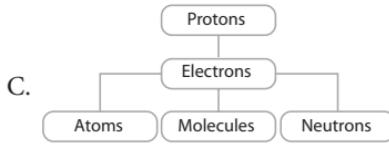
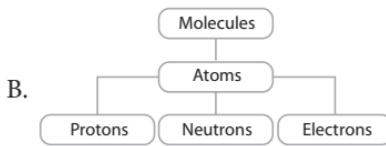
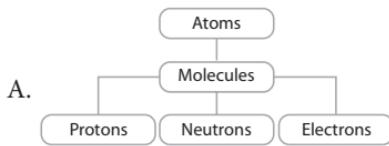
C.



D.

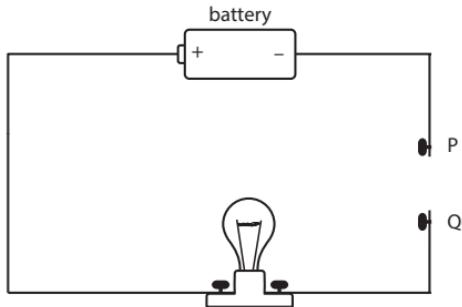
David is given a sample of an unknown solid substance. He wants to know if the substance is a metal. Write down one property he can observe or measure and describe how this property could be used to help identify whether the substance is a metal.

Which of these diagrams best represents the structure of matter, starting with the more complex particles at the top and ending with the more fundamental particles at the bottom?



Write down one thing you might observe that shows that energy has been released during a chemical reaction.

Rods made of different materials are connected between points P and Q in the circuit diagram shown below.



Which rod would cause the bulb to light?

- A. copper rod
- B. wood rod
- C. glass rod
- D. plastic rod

What is the chemical formula for carbon dioxide?

- A. CO
- B. CO₂
- C. C
- D. O₂

Complete the table below to show the number of atoms of each element in a molecule of sulfuric acid (H_2SO_4).

Element	Number of Atoms
Hydrogen	
Sulfur	
Oxygen	

Robert put two drops of an indicator into vinegar, and the color turned red. He then added drops of ammonia solution until the color disappeared.

What process occurred?

- A. rusting
- B. melting
- C. evaporation
- D. neutralization

Ahmet put some powder into a test tube. He then added liquid to the powder and shook the test tube. A chemical reaction took place.

Describe two things he might observe as the chemical reaction took place.

1.

2.

During which chemical process is energy absorbed?

- A. iron nails rusting
- B. candles burning
- C. vegetables rotting
- D. plants photosynthesizing

The table below shows some elements, compounds, and mixtures.

Classify them by putting an X in the appropriate column beside each one.

	Element	Compound	Mixture
Air			
Sugar			
Salt			
Gold			
Sea water			
Helium			

Which of the following defines a compound?

- A. different substances mixed together
- B. atoms and molecules mixed together
- C. atoms of different elements combined together
- D. atoms of the same element combined together

Why can a small fire be put out by placing a heavy blanket over it?

- A. This lowers the temperature.
- B. This make the flames smaller.
- C. This absorbs the burning substance.
- D. This keeps oxygen from reaching the fire.

Some physical properties of five different substances (A, B, C, D, and E) are outlined in the table below. Two of the substances are metal.

	Substance A	Substance B	Substance C	Substance D	Substance E
Physical state at room temperature (20°C)	solid	solid	liquid	liquid	gas
Appearance/color	shiny grey	white	silver	colorless	colorless
Conducts electricity	yes	no	yes	yes	no

List the two substances (A, B, C, D, or E) that are metal.

1.

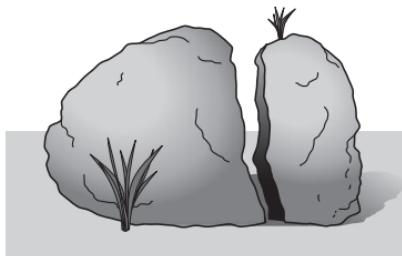
2.

A car tire runs over a can and crushes it completely.

Which statement is true for the atoms in the structure of the can?

- A. The atoms are broken.
- B. The atoms are flattened.
- C. The atoms remain the same.
- D. The atoms are changed into different atoms.

Scientists think that the rocks in the picture were once a single rock.



Which property of water had the **most** effect on splitting the rock into two pieces?

- A. Water expanding when it freezes.
- B. Water boiling at 100°C.
- C. Water having a density less than rock.
- D. Water dissolving many substances.

Which of the following energy conversions takes place in a battery-operated flashlight?

- A. electrical → mechanical → light
- B. chemical → mechanical → light
- C. chemical → electrical → light
- D. nuclear → electrical → light

The figure shows a parachute jumper in four positions.



1. In the aircraft before the jump



2. In freefall immediately after jumping before the parachute opens



3. Falling to the ground after the parachute opens



4. On the ground just after landing

In which of the positions does the force of gravity act on the jumper?

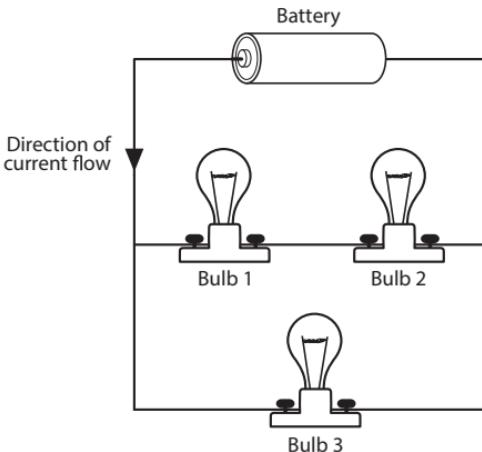
- A. Position 2 only.
- B. Positions 2 and 3 only.
- C. Positions 1, 2 and 3 only.
- D. Positions 1, 2, 3, and 4.

A gas is heated and its temperature increases.

What happens to the gas molecules?

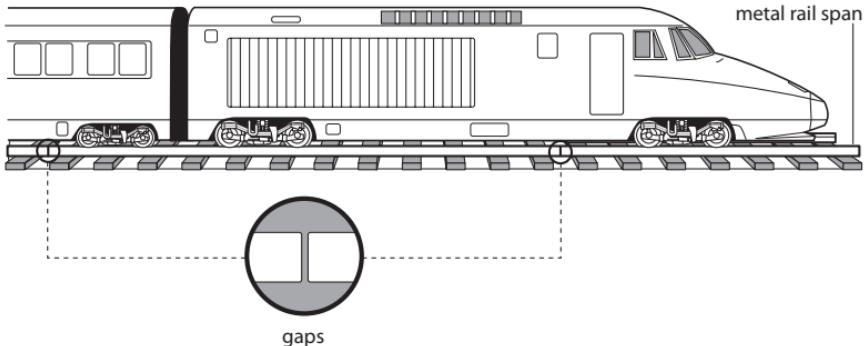
- A. They get bigger.
- B. They move faster.
- C. They move slower.
- D. They increase in number.

Three identical light bulbs are connected to a battery as shown in the diagram. The arrow indicates the direction of the current flow.



Which statement is true?

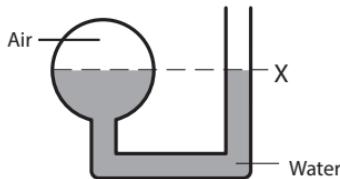
- A. The current in Bulb 1 is greater than the current in Bulb 2.
- B. The current in Bulb 1 is greater than the current in Bulb 3.
- C. The current in Bulb 2 is the same as the current in Bulb 3.
- D. The current in Bulb 2 is the same as the current in Bulb 1.



Which of the following best explains why some railroad tracks are laid down with gaps between the metal rail spans?

- A. To allow for the metal tracks to expand on hot days.
- B. To allow for the metal tracks to expand on cold days.
- C. To allow for cooling of the tracks by air in the gaps.
- D. To allow for vibration of the tracks due to the train.

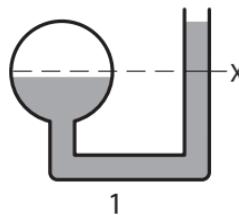
The figure shows a glass tube open at one end and connected to a closed glass sphere at the other end. The equipment is partly filled with water, as shown, so that there is air above the water in the sphere. The water in the tube reaches level X.



The air in the glass sphere is then heated by a hair dryer.

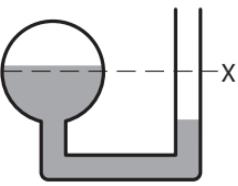
- A. What will be the water level in the open glass tube after the sphere is heated? (Circle 1, 2 or 3 below.)

Higher than X



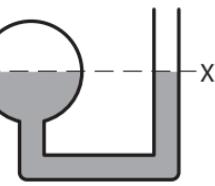
1

Lower than X



2

Same as X



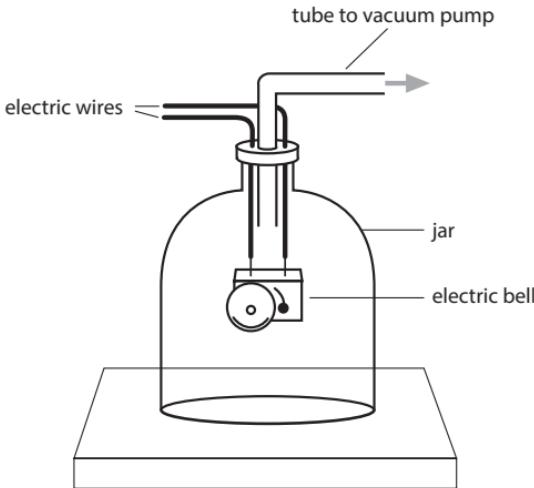
3

- B. Explain your answer.

A man climbed to the top of a very high mountain. While on the mountain top, he drank all the water in his plastic water bottle and then put the cover back on. When he returned to camp in the valley, he discovered that the empty bottle had collapsed.

Which of the following best explains why this happened?

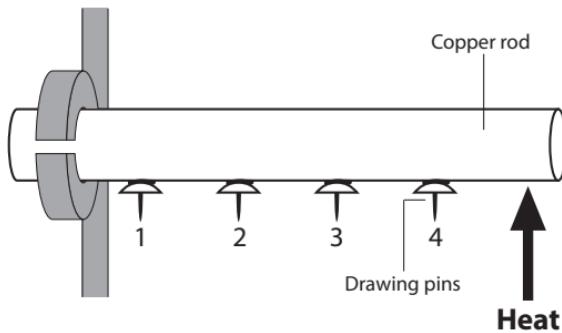
- A. The temperature is lower in the valley than on the mountain top.
- B. The temperature is higher in the valley than on the mountain top.
- C. Air pressure in the valley is lower than on the mountain top.
- D. Air pressure in the valley is higher than on the mountain top.



The diagram shows an electric bell inside a jar. The electric bell is switched on and a ringing sound is heard. The air is then pumped out of the jar.

What will happen to the sound of the bell when the air is pumped out of the jar? Explain your answer.

A student attaches four drawing pins to a copper rod using candle wax as shown in the diagram. The rod is then heated continuously at one end and the pins fall off in the order 4, 3, 2, 1.



By which process does heat reach the pins?

- A. expansion
- B. radiation
- C. conduction
- D. convection

As a liquid changes into a gas, which characteristics or properties change and which stay the same?

In each row of the table below, put an X in the appropriate column.

	Changes	Stays the Same
Density		
Mass		
Volume		
Size of molecules		
Speed of molecules		

A student sets up an investigation to test the strength of magnets. He has several magnets of different sizes, shapes, and masses. He uses the magnets to lift metal paper clips.

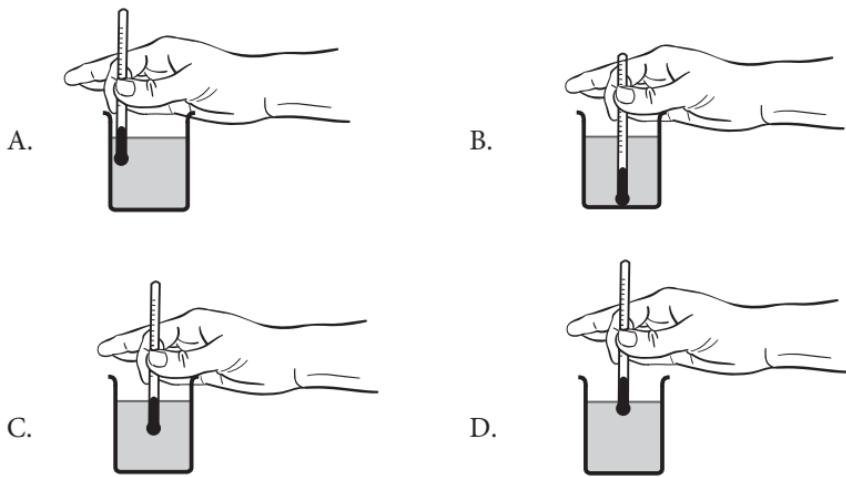
How is the strength of a magnet defined in the investigation?

- A. by the mass of the magnet lifting the metal paper clips
- B. by the size of the magnet lifting the metal paper clips
- C. by the number of metal paper clips lifted by the magnet
- D. by the time the metal paper clips stay on the magnet

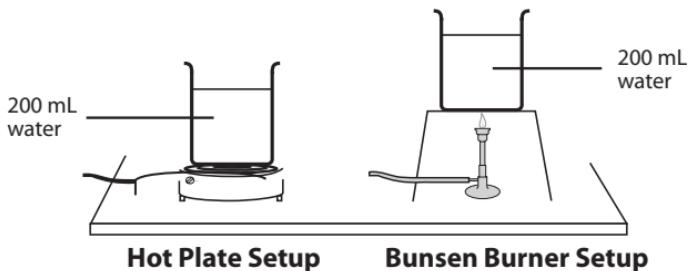
Two kinds of heat sources are usually available in the science lab; an electric hot plate and a Bunsen burner. Jack planned an investigation to test which of these sources heats water faster.

He poured 200 mL of water into each of two identical beakers and recorded the initial temperature of the water in each beaker.

- A. Where should Jack place the thermometer to accurately take his readings during his investigation?



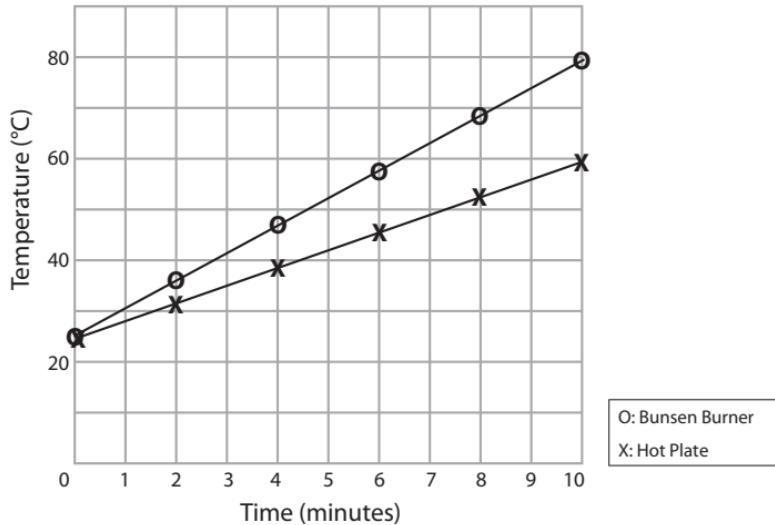
Jack then placed one beaker on a hot plate and the other over a Bunsen burner, as shown below.



He recorded the temperature of the water in each set up every two minutes for ten minutes.

- B. List one variable that Jack controlled in his investigation.

C. Jack used his results to draw a graph as shown below.



Use the information in the graph to explain which heat source heated the water faster.

What happens to the molecules of a liquid when the liquid cools?

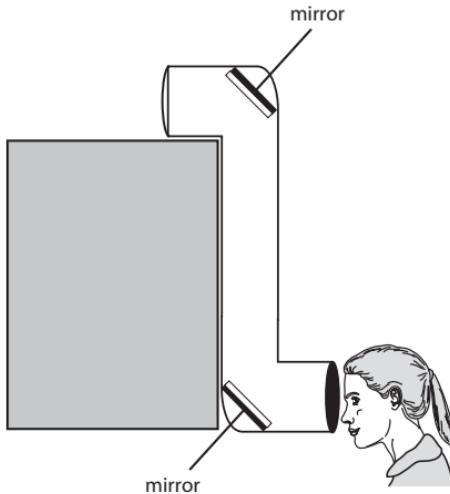
- A. They slow down.
- B. They speed up.
- C. They decrease in number.
- D. They decrease in size.

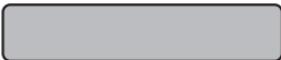
Light travels fastest through which of the following?

- A. air
- B. glass
- C. water
- D. a vacuum

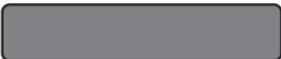
The diagram below shows a periscope. Mary is using it to look over a wall.

Draw the path the light ray would take through the periscope. Show the direction of the light ray with arrows.





Metal bar 1



Metal bar 2

Ray has two metal bars. He knows Metal bar 1 is a magnet.

- A. How could he use Metal bar 1 to find out if Metal bar 2 is a magnet?

- B. What would he observe if Metal bar 2 is a magnet?



Diagram 1

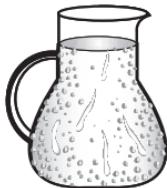


Diagram 2

Ice-cold water was placed in a glass pitcher on a hot day (Diagram 1). Soon afterwards, liquid appeared on the outside of the pitcher (Diagram 2).

Describe the process that caused the liquid to appear on the outside of the pitcher.

The pictures below show two ice blocks. Block 2 is wrapped in newspaper.



Ice Block 1



Ice Block 2 wrapped in newspaper

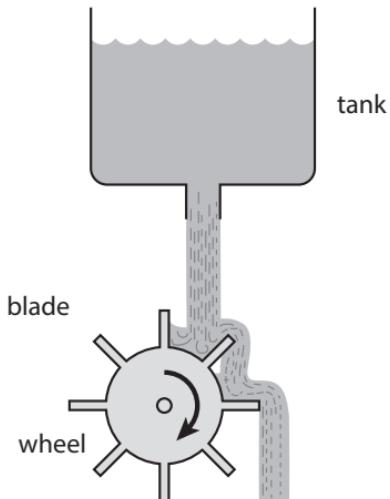
A. Which ice block will melt first?

(Check one box.)

- Block 1
- Block 2

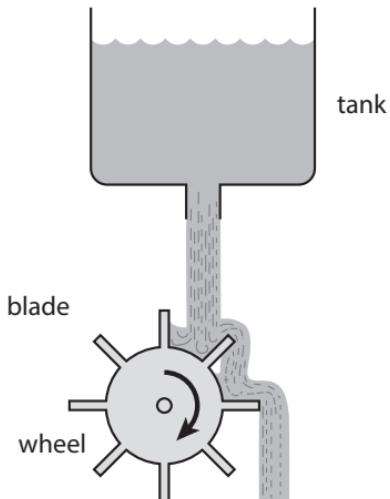
B. Explain your answer.

The diagram shows water flowing from a tank and rotating a wheel.



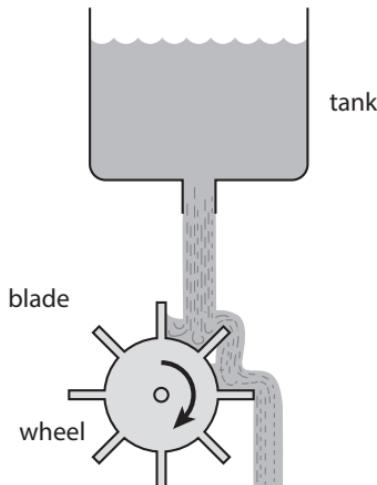
- A. What kind of energy does the water have when it is in the tank?

The diagram shows water flowing from a tank and rotating a wheel.



- B. What kind of energy does the water have just before it hits the wheel?

The diagram shows water flowing from a tank and rotating a wheel.



C. Write one change to the system that will make the wheel rotate faster.

An object has a density of 1.1 g/cm³.

A. In which liquid would this object float?

(Check one box.)

Liquid X: 1.3 g/cm³

Liquid Y: 0.9 g/cm³

B. Explain your answer.

The following five statements describe processes involved in the water cycle. Water evaporation from the sea is identified as a first step in the water cycle.

Number the other statements 2 through 5 in the order in which these processes take place.

- _____ Water vapor rises in warm air.
- _____ Water travels along a river to the sea.
- 1 Water evaporates from the sea.
- _____ Water vapor is cooled and forms clouds.
- _____ Clouds move and water falls on land as rain.

State one way that a volcanic eruption can affect the environment.

Which of the following is the major cause of tides?

- A. heating of the oceans by the Sun
- B. gravitational pull of the Moon
- C. earthquakes on the ocean floor
- D. changes in wind direction

What is the main difference between planets and moons in our solar system?

- A. All planets can support life; moons cannot.
- B. All planets have atmospheres; moons do not.
- C. All planets orbit the Sun; all moons orbit planets.
- D. All planets are larger than all moons.

Soils change both through natural processes and as a result of human activity.
Which of the following soil changes is due only to natural causes?

- A. degradation of nutrients due to pesticides
- B. formation of deserts due to tree felling
- C. flooding due to dam construction
- D. removal of nutrients due to heavy rains

The following waste materials are buried in a landfill.

Which will break down most quickly?

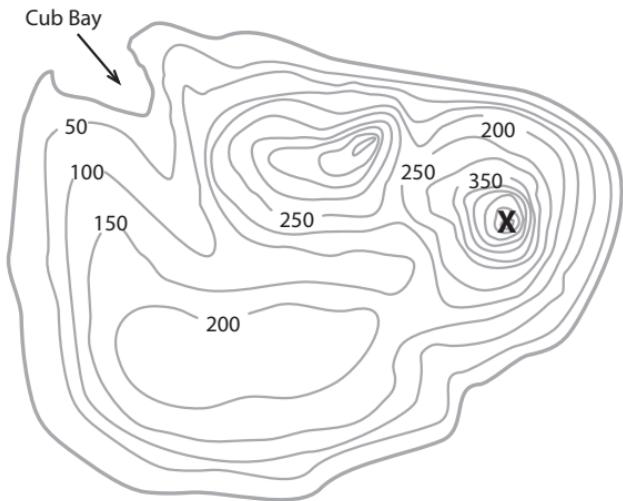
- A. steel
- B. plastic
- C. glass
- D. paper

Tamora is preparing to climb one of the highest mountains on Earth. She knows that the atmospheric conditions will change the higher up the mountain she climbs.

In the table below, write down two atmospheric conditions that will change as Tamora climbs the mountain. State what Tamora needs to bring in order to survive these two conditions at high elevations.

Change in Atmospheric Condition	What Tamora Needs to Bring
1.	
2.	

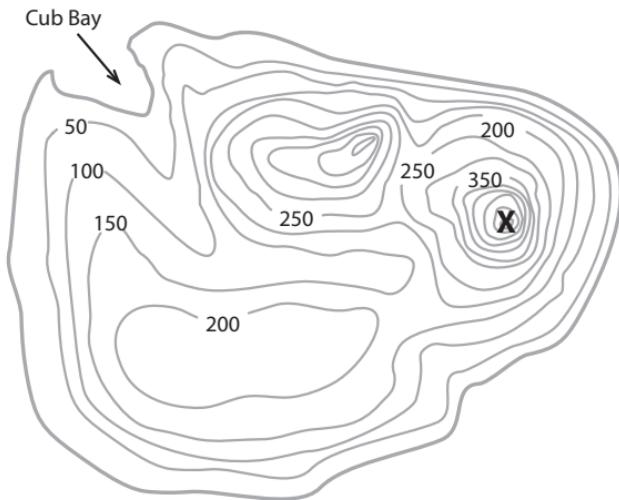
Tiger Island



The diagram above shows a topographic map of Tiger Island. The lines on the map are contour lines that connect points at the same elevation. The elevations shown are in meters.

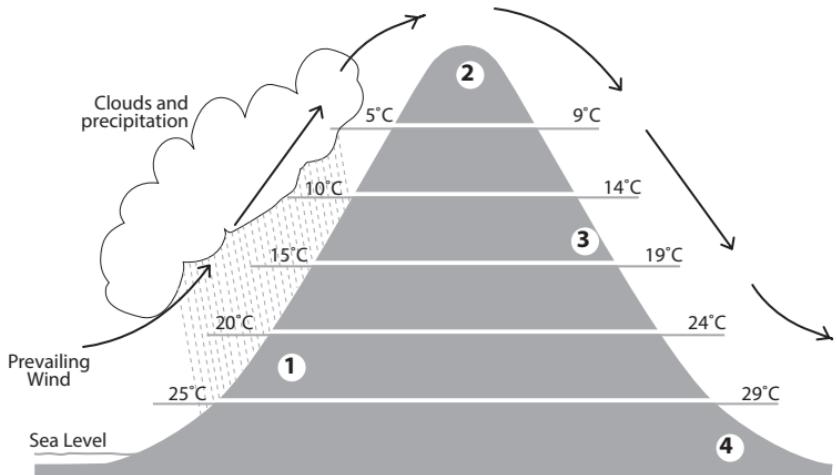
A. What geographical feature is found at point X? _____

Tiger Island



The diagram above shows a topographic map of Tiger Island. The lines on the map are contour lines that connect points at the same elevation. The elevations shown are in meters.

- B. Think about the source of rivers and how they flow. Now draw the path of a river between point X and Cub Bay. Use an arrow to indicate on the map which direction the river will flow.



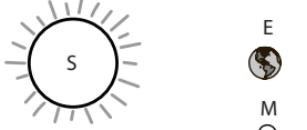
The diagram above shows the prevailing wind direction, precipitation, and average air temperatures at different elevations on both sides of a mountain. In which location are you most likely to find a jungle?

- A. location 1
- B. location 2
- C. location 3
- D. location 4

Where are active volcanoes most likely to be found?

- A. where rivers form
- B. where tectonic plates meet
- C. where oceans are deepest
- D. where land and water meet

Which diagram shows the position of the Sun (S), moon (M), and Earth (E) during an eclipse of the moon? (Not drawn to scale)

- A. 
- B. 
- C. 
- D. 

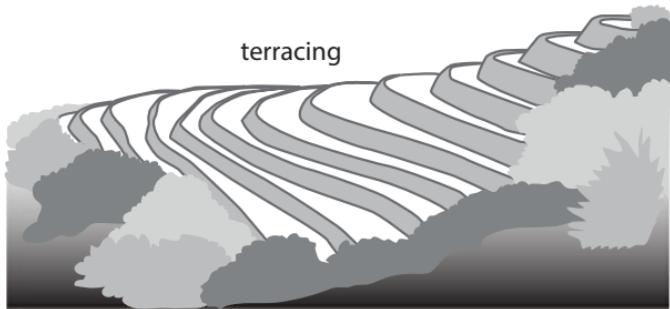
How does water that has evaporated from the sea end up as rain on land many miles away?

Two continents are separated by water.

Geologists are looking for evidence that the two continents were once joined.

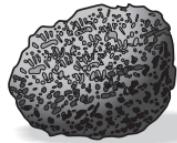
What fossil evidence would support this idea?

The diagram below shows a field on a slope that is being farmed using the terracing method.



Write one advantage of using the method of farming shown in the diagram.

Some volcanic rocks have many holes in them.



How were the holes made?

- A. Insects dug into the rock when it was soft.
- B. Gas bubbles were trapped in the rock when it cooled.
- C. Rain dropped on the rock when it was soft.
- D. Small stones fell out of the rock when it cooled.