

Activity Pack: Endangered Animals

KS3 & KS4

This pack is designed to provide teachers with information to help you lead a trip to Colchester Zoo focusing on Endangered Animals



How to Use this Pack:

This Endangered Animal Tour Guide pack was designed to help your students learn about endangered animals and prepare for a trip to Colchester Zoo.

The pack starts with a few pages of background information for teachers outlining the classification of endangered animals, major problems facing endangered animals, and what zoos are doing to help endangered animals.

The pack continues with suggested endangered animals to visit at Colchester Zoo, including a map of where to see them and which encounters/feeds to attend. The next section contains fact sheets about these animals. This includes general information about the type of animal (e.g. what's its status, what threats does it face, etc.) and specific information about individuals at Colchester Zoo (e.g. their names, how to tell them apart, etc.). This information will help you plan your day, and your route around the zoo to see a variety of endangered animals. We recommend all teachers read through this and give copies to adult helpers attending your school trip.

The rest of the pack is broken into: pre-trip, at the zoo and post-trip. Each of these sections starts with ideas to help teachers think of ways to relate endangered animals to other topics. Then there are a variety of pre-made activities and worksheets. Activities are typically hands on 'games' that introduce and reinforce concepts. Worksheets are typically paper hand-outs teachers can photocopy and have pupils complete independently. Teachers can pick and choose which they want to use since all the activities/worksheets can be used independently (you can just use one worksheet if you wish; you don't need to complete the others).

The activities and worksheets included in this pack are for a range of ages in KS1 and KS2. Feel free to use the activities and worksheets for students of all ages.

We suggest using the pre-trip activities/worksheets prior to your trip to familiarise your pupils with vocabulary, context, and the animals they will see. The at the zoo activities/worksheets typically require information your pupils can gather while they are at Colchester Zoo and are designed for completion during your school trip. The post-trip activities/worksheets are designed to be used after your visit to build on information gathered during your school trip. Within these sections, the activities/worksheets can be used in any order.

If you would like any more guidance, or have any questions about any of the information contained within this pack, please contact our education department at education@colchesterzoo.org



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Endangered Animal Classification:

In 1964, the International Union for the Conservation of Nature (IUCN) created the Red List of Threatened Species (IUCN Red List or Red Data List). Various countries have their own lists, however the IUCN list is the main classification of endangered species on a global level.

The red list is created by various scientists and specialist organisations from around the world. Organisms (plants, animals, fungi, etc.) are assessed based on a number of criteria including: rate of decline, population size, area of geographic distribution, degree of population fragmentation and current risks. Based on assessment, organisms are assigned to one of the red-list categories. The list is regularly reviewed and species can move up (become more endangered) or down the list (no longer threatened) based on new data.

Many people refer to all 'threatened category' animals as endangered.



Not Evaluated (NE) - Not yet been evaluated against the criteria

Data Deficient (DD) - Inadequate information to make an assessment



Least Concern (LC) - Lowest risk. Widespread and abundant taxa are in this category.



Near Threatened (NT) - Low risk. Likely to qualify for a threatened category soon.



Vulnerable (VU) - Threatened. Considered to be facing a high risk of extinction in the wild.



Endangered (EN) - Threatened. Considered to be facing a very high risk of extinction in the wild.



Critically Endangered (EN) - Threatened. Facing an extremely high risk of extinction in the wild.



Extinct in the Wild (EW) - Only survives in captivity.



Extinct (EX) - The last individual of the population has died. The species is no longer alive anywhere.

Background Information — Causes

Why animals become endangered is important to understand, especially since humans are a major cause. Collectively, the threats to animals are ‘the HIPPO dilemma’ (which has nothing to do with hippos the animals). Hippo is an acronym which stands for:

- **Habitat Loss** (Destruction and Fragmentation)
- **Invasive Species**
- **Pollution**
- **Poaching**
- **Overuse**

Habitat Loss (Destruction and Fragmentation)

The destruction of habitats is one of the most serious threats to wildlife across the world, and many habitats are affected. Habitat loss happens when humans convert the habitat into a different land use. With this new use, the animals have nowhere to live. Some of the reasons habitat is lost include: houses (space to build homes and cities), roads, tourist resorts, farming, mining, factories, grazing pastures, and timber industries.

Commercial and illegal logging as well as forest clearing for agriculture are the top reasons for habitat loss worldwide, especially problematic with rainforest animals.

Invasive Species (Alien Species, Introduced Species)

In their natural habitat, every animal has a specific role (a niche). The natural ecosystem always stays in balance, populations of specific animals or plants might change but will return to a natural balance. However, when animals or plants that do not belong in the habitat are introduced into the environment they can disturb this balance.

Animals are sometimes moved on purpose, or sometimes accidentally transported. For example: foxes and cats have been introduced around the world and cause the decline in many species of birds and small mammals. Rats have been introduced to most of the world, and will eat almost anything. Rats cause a lot of problems on islands, especially islands with ground nesting birds, as they eat the chicks and eggs. The 10 worst invasive in the world are: kudzu vine, black rat, Asian tiger mosquito, cotton whitefly, snakehead fish, Asian longhorn beetle, cane toad, European rabbit, and Nile perch.

Background Information — Causes

Pollution

Pollution is anything that doesn't belong in the natural environment. Physical and chemical pollution can damage the quality of water, air and soil. One type of pollution is chemicals to control insects and plants (herbicides, pesticides and fertilisers). These can directly poison animals, and can cause food chain to collapse.

Litter is another type of pollution. Some litter (food products) can biodegrade relatively quickly and return to things found in nature. Other types of litter, such as plastic, do not biodegrade. Plastic is inert, and if dropped somewhere, will stay there for hundreds or even thousands of years. Without a way to remove plastic, it accumulates in rivers and flows to the sea. All the oceans of the world now have giant patches of floating plastic rubbish mainly caused by people dropping it on land.

Air pollution is a major cause of problems for humans and animals. Chemicals in the air make it hard for animals to breath.

Noise and light pollution are also a major course of death in birds, who fly into lit windows and the noise from boats and sonar confuses whales and results in them getting beached.

Poaching

Poaching is simply illegal hunting. Hunting of endangered animals is illegal in many countries. However, because there is a lot of money in the illegal wildlife trade, people still hunt these animals. This includes hunting for fur, horns, ivory, medicine, etc.

Overuse (Over exploitation)

Overuse is when too much is taken from the natural environment. This includes over-fishing, over-grazing, over-logging, harvesting coral, harvesting plants, taking guano, capturing animals for pets, etc. This is unstainable, especially if the species reproduces slowly.

Background Information — Zoos

Historically, zoos were simply places to display animals, but in the past 50 years zoos have changed their goals and purposes. Good zoos are accredited and are members of organisations such as BIAZA (British and Irish Association of Zoos and Aquaria), which is in turn a member of EAZA (European Association of Zoos and Aquaria), which is in turn a member of WAZA (World Association of Zoos and Aquaria). These organisations ensure that zoos look after their animals, and work towards the same four main goals: conservation, education, research and recreation.

Conservation

Zoos are directly involved in conservation through research, captive breeding and re-introduction programmes. Zoos are indirectly involved in conservation through supporting in-situ projects, and participating in training or education.

Colchester Zoo has donated money to conservation projects worldwide. Funding is provided via Colchester Zoo's charity Action for the Wild. Action for the Wild was formed in 1993 and achieved charitable status in 2004.

(See our website Information Packs section to read more details in our Conservation Pack).

Education

Most zoos have an education programme for school groups and various interpretation boards or interactive displays around the enclosures. This sort of information sparks interest, which leads to respect - if people respect animals they are less likely to abuse them or buy endangered animal products, and are more likely to support conservation efforts, reduce pollution etc.

Research

Research is ongoing in zoos in areas such as enclosure enrichment, veterinary care, reproductive behaviour and nutrition. This knowledge benefits the captive animals and their wild counterparts. There are many specific techniques that have been perfected in zoos and then applied to wild populations. These include: in vitro fertilisation, freezing eggs and sperm, artificial insemination, embryo sexing, cross fostering, embryo transfer, artificial and surrogate incubation and contraception. Drug dosages, disease diagnosis, individual identification and monitoring devices, such as radio collars, are other techniques developed in zoos and applied to the conservation efforts for wild populations.

Recreation

Zoos need people to visit them and enjoy the visit. These visitors provide valuable money which are used to run zoos and help fund their other goals (Conservation, Education, and Research). Additionally, by being places that are fun, visitors enjoy themselves. They might learn about the animals, but equally important, they get the chance to see the animals up close and make a connection with them. By offering people this close up experience, zoos hope to generate awe and wonder in their visitors and in doing so, hope to make their visitors care about animals.



Map Keys

	First Aid
	Information
	Gift Shop
	Picnic Area
	Play Area
	Toilets
	Fire Assembly Point
	Face Painting

Endangered Animals to See at Colchester Zoo:



Download a more detailed map from our website:
www.colchesterzoo.org

Endangered Animals to See:

1. Worlds Apart: visit the **Golden Lion Tamarins**, at the exit continue towards the orangutans and stop at Penguin Shores or Inca Trail to see the **Humboldt penguins**.
2. Rajang's Forest: see the **orangutans**.
3. The **sun bear** enclosure at the top and down the steep hill to the **Amur leopard**.
4. Elephant Kingdom: **African Elephants**, across the path at Kingdom of the Wild: **White Rhinos**.
5. Edge of Africa: at the very bottom of the zoo, visit the **cheetahs**.
6. Inside the giraffe building, at the very back and bottom are the **pygmy hippopotamus**.
7. Visit our **Amur tigers** and continue further along to path to the **Visayan spotted deer** and **Visayan warty pigs**.
8. See the **Komodo dragons**. Turn down the hill at Wilds of Asia to visit the **red pandas**.

Feeds and Talks to Attend:

Penguin Encounter (1 on the Endangered Animals to see map) watch the penguins being fed.

Orangutan Encounter (2 on map) watch the orangutans being fed by the keepers. A great time to see them climbing to the roof of their enclosure!

Sun Bear Encounter (3 on map) this is the best time to see these enduring animals moving around instead of sleeping - check the clock by their enclosure for times!

Amur leopard Encounter (3 on map) a keeper will explain all about these endangered big cats, and you might get the chance to see training or them eating.

Komodo Dragon Encounter (8 on map) the reptile keepers will tell you all about the enormous animals, and might even be training them.

Visit www.colchesterzoo.org to see the 'Daily Timetable' for a full list of all talks, feeds, and shows and their times



Please note that times of feeds may change without notice.
Visit the website and ask at entrance for an up to date schedule .



Ceratotherium simum White Rhinoceros

Habitat: Savannah

Distribution: South and northeast Africa

Diet: Grazes on grasses and other vegetation

Longevity: 45 years in the wild, longer in captivity

Status: Near Threatened

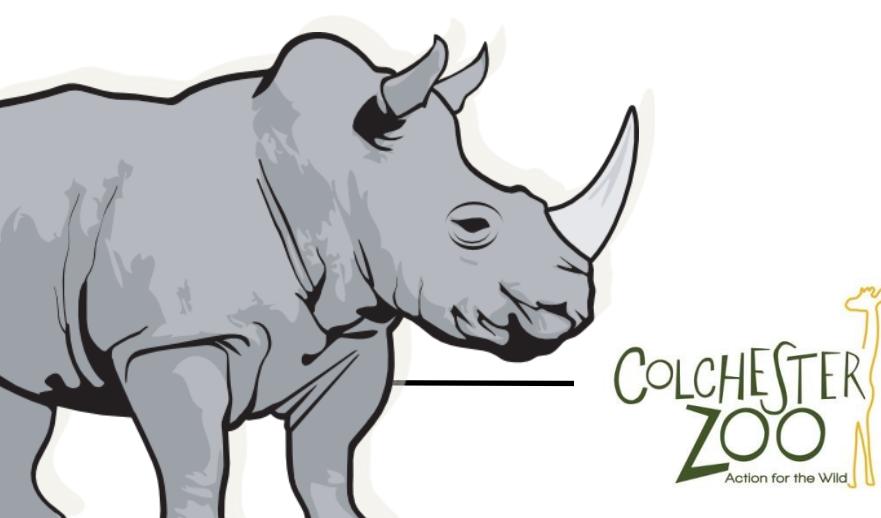
There are five species of rhino: white rhino, Indian rhino, black rhino, Sumatran rhino, and Javan rhino. Indian rhinos are vulnerable. Black, Sumatran, and Javan are all listed as critically endangered. The northern subspecies of white rhino is listed as extinct in the wild. Southern white rhinos are the least endangered.

Southern white rhinos are considered near threatened. They have experienced escalating poaching in recent years due to increase demand in the illegal trade of rhino horn. As other rhino species numbers decrease, more poaching effort is focusing on the white rhino. It is predicted, that once other species are extinct, the rate of poaching white rhino will increase dramatically and their population will quickly decline.

Current protection efforts have helped limit poaching. Without strong conservation measures, within five years white rhinos will meet the criteria to be listed as endangered if poaching levels continue at the current rates. If poaching increases, this will happen a lot faster.

Rhino poaching is primarily for their horns. Rhino horns are made of keratin fibres. Keratin is the same material in human hair and fingernails. The horns are seen as a sign of wealth and sometimes used to make trinkets and dagger handles. However, the most common use for rhino horn is in traditional medicine. Scientific evidence has proven there is no medicinal benefit to rhino horn. However, many people believe it can cure a wide range of illnesses, including flu and cancer, so they are willing to spend a lot of money to acquire it illegally.

Colchester Zoo's rhinos are part of an international breeding programme and there have been several calves born since 2009.





Loxodonta africana

African Bush Elephant

Habitat: Savannahs bush elephant

Distribution: Africa south of the Sahara, mainly in reserves

Diet: Grass, leaves, woody plants, shrubs, bark, flowers and fruits.

Longevity: Up to 60 years, longer in captivity

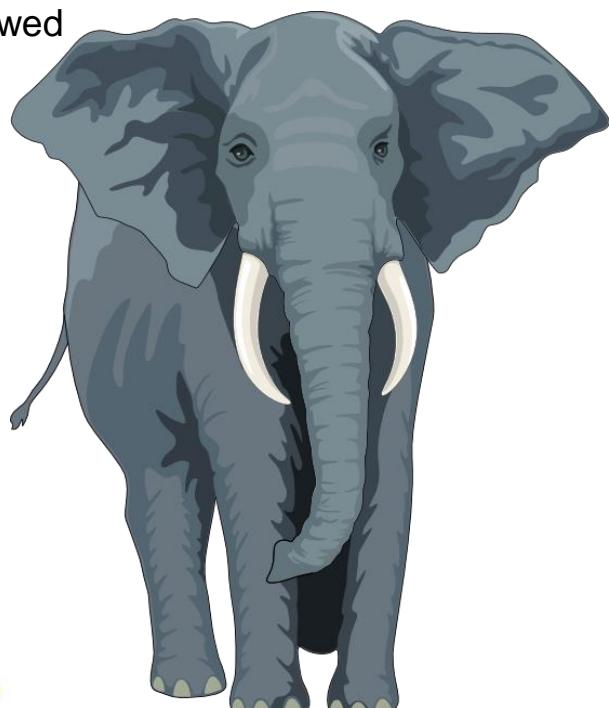
Status: Vulnerable

Elephants are the largest land mammal on Earth. They weigh up to 6 metric tons, are up to 7.5m long and over 3m high. Males are larger than females. Their tusks are made of ivory and are modified front teeth. Elephants use their tusks to dig in the ground, knock bark off trees, and scare away predators. An elephant's trunk is a modified nose and upper lip. Elephants use their trunks for many purposes including drinking, squirting water, picking things up, breathing, and making noise (trumping). Because the trunk is their nose, they do not have any bones or teeth in it, but it does have 40,000 muscles!

Elephants live in complex social herds. Females form groups of closely related individuals led by the dominant female, called the matriarch. Males are sometimes solitary, or form groups with other males. Living in groups helps the elephants avoid predators. The only predator of adult elephants is humans, but baby elephants may be hunted by other predators, such as lions.

Elephants are vulnerable, with very few living outside of protected areas. One of the major threats elephants face is poaching and hunting for the ivory trade. Humans kill elephants and carve the tusks into statues, bracelets, and other souvenirs and trinkets.

There are two elephant paddocks. One can be viewed across from the giraffe paddock and the second can be viewed from the Elephant Bush Walk path.





Cheetah

Habitat: Savannah

Distribution: Southern and eastern Africa, Middle East

Diet: Hooved mammals, hares, rodents and other small animals

Longevity: 12 years in the wild, up to 17 in captivity

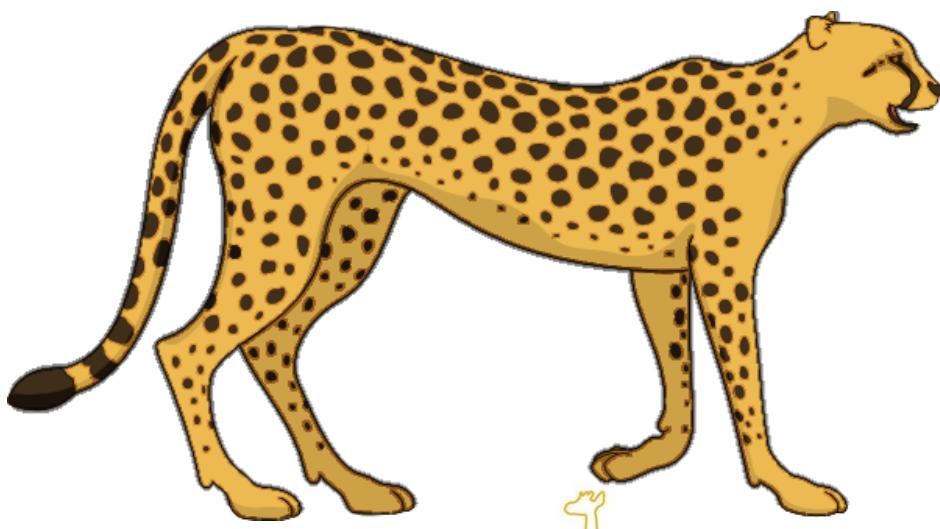
Status: Vulnerable

The Cheetah is easily distinguished from other spotted cats by their skinny body, small head and exceptionally long tail and legs. They can weigh up to 60kg and stand between 60 and 80cm tall. On their face they have highly characteristic lines running from the corner of their eyes to their mouth, the rest of their coat is spotted.

Cheetahs have a unique way of catching their prey. Rather than stalking up close, Cheetahs will stalk a herd to within 30 metres or so, panic them, then sprint after one animal. From a standing start they can reach their top speed of 95km/h in about 3 seconds! They have highly flexible spines which can bend and flex allowing them to take long and rapid strides. Their claws help with traction since they are non retractable, whereas other cats can retract their claws. When they are close the cheetahs flick their front feet to knock the prey off balance and cause it to fall. If they do not manage to catch their prey fairly quickly they will give up, as running uses a lot of energy.

In the 1970's, cheetah populations were estimated at 15,000. Now there are only 7,500 known, and it's unlikely that there are more than 10,000 in the wild. Their population has declined at least 30% in the last 30 years. This decline is primarily because of habitat loss as well as killing cheetahs out of fear they prey on livestock and hunting for fur.

Colchester Zoo has successfully bred cheetahs in the past and it is hoped our current cheetahs will also breed in the future.





Pygmy Hippopotamus

Habitat: Tropical rainforest and swamps

Rainforest Layer: Understory

Distribution: Western Africa

Diet: Leaves, shoots, roots and fruit

Longevity: 35 years in the wild, up to 42 in captivity

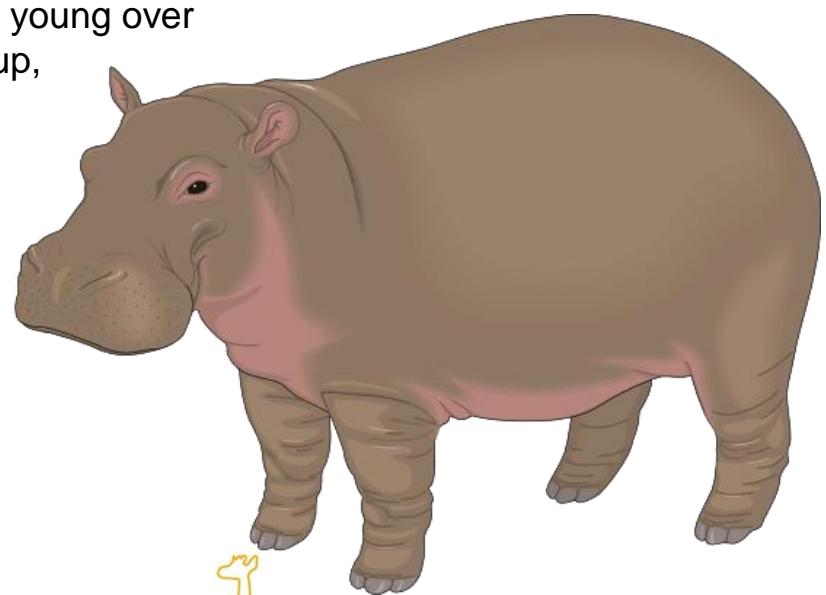
Status: Endangered

The Pygmy hippo is much smaller than the common hippopotamus. It is only a metre tall at the shoulder and weighs just 272 kg. Young are about the size of a housecat. They have smooth, almost hairless skin that is brown-black. They secrete a white substance from their pores which acts as a moisturiser. Pygmy hippos do not have webbed toes (like the larger hippos) because they spend more time on land. When threatened, they retreat into forest cover than the water.

Despite their small size, pygmy hippos can be aggressive when threatened or defending their territory. They are not social animals, preferring to live alone or in pairs, avoiding other hippos. Pygmy hippos have large territories, males cover 160 hectares, females 40—60 hectares. They have several resting places which they exclusively use for sleeping. They are nocturnal, usually active between 6pm and midnight when they wander around the forest floor in search of fallen fruit and other food.

Because pygmy hippos have such large ranges, they are severely effected by deforestation. They are also endangered due to hunting for food and hunted for their teeth. They are hard to study in the wild, but estimates suggest there are fewer than 3,000 left in the wild.

Colchester Zoo's hippos are part of an international breeding programme and have had several young over the years. When the young grow up, they move to other zoos around the world to aid with the progression of the breeding programme.





Ailurus fulgens

Red Panda

Habitat: Temperate (woodland) forests

Distribution: Himalayas, Burma, Sichuan and Yunnan

Diet: Mainly bamboo but also small mammals, birds, eggs, blossoms, berries, and fruit

Longevity: 14 years in the wild,

Status: Endangered

Red pandas look like a cross between a racoon and a giant panda with fluffy fur, a striped bushy tail and a white 'panda' face. They are a lot smaller than giant pandas, only up to 60cm long and weighing just 3-5kg. They are not true bears, but scientists still don't know if they're more closely related to racoons, or bears, or something else!

Red pandas are nocturnal, mainly active at dawn and dusk, spending most of the day resting in the trees. They are well adapted to life in the trees. The pads of their feet are covered in hair to prevent them slipping and they can jump up to 1.5m from branch to branch. Their feet can also turn backwards, this is useful because it means they can climb down trees head first! They are territorial, marking the boundaries with scent, using urine and substances secreted from their foot pads. Local names for the Red Panda include 'Wha' and 'Chitwa' due to their twittering call used for communication.

Red pandas are threatened by habitat loss, habitat fragmentation and poaching for fur. The biggest threat is the increasing human population within the species range. As the local human population grows there is increased pressure for land to use for housing and farming and pressure to chop down the forests for firewood.

Colchester Zoo's red pandas are part of an international breeding programme and have had cubs in the past, and it is hope they do in the future. When the cubs grow up, they have all moved to other zoos, since in the wild they would not stay with their parents.



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Spheniscus humboldti

Humboldt Penguin

Habitat: warm coastal waters and sandy/scrubby shorelines

Distribution: Peru, Chiles and islands off the west of South America

Diet: Crustaceans, krill, squid, and fish

Longevity: 30 years

Status: Vulnerable

Humboldt penguins are a medium sized penguin, about 65cm tall and weight about 4.2kg. The feathers are black on the upper parts, light on the lower section and have a black stripe across their chest. Like all penguins they are flightless, since their wings have lost the flexibility at the elbows and become more like flippers. These 'flippers' allow them to swim up to 25 kph 'flying' underwater, essential for catching fish and escaping predators. The Humboldt penguins live in a warmer climate than most other penguins but they retain the layer of insulating fat to protect them from the cold when swimming. This gives them problems when trying to keep cool on a warm day. Humboldt penguins do however have shorter plumage than other penguin species.

Humboldt penguins excavate burrows to nest in, usually about 3 metres in length. At the end is a small chamber which they line with sticks, mosses and lichen. Incubation of the two eggs shared between both sexes, they often pair for life and stay with their mate.

The primary threats for this species is accidental capture in fishing nets (resulting in drowning), illegal hunting for food and illegal capture for the pet trade. Historically, populations declined due to over-exploitation of guano (which the penguins require for their nests). It is still harvested in some parts of their range, but no longer a major threat.

There are lots of Humboldt penguins at Colchester Zoo living in two separate breeding colonies. At Penguin Shores get an underwater view of them swimming, or at Inca Trail view the penguins from above. The penguins all have unique markings of black spots on their bellies. Look for the signs at the enclosures and see if you can identify the names of all the penguins!





Varanus komodoensis

Komodo Dragon

Habitat: Dry grasslands, savannahs and (monsoon) rainforests

Distribution: Indonesian islands of Komodo, Rinca, Gili Motang, Gili Dasami and Flores.

Diet: Deer, wild boar, and snakes, will also eat fish and smaller Komodo dragons

Longevity: Up to 50 years in the wild, presumed longer in captivity

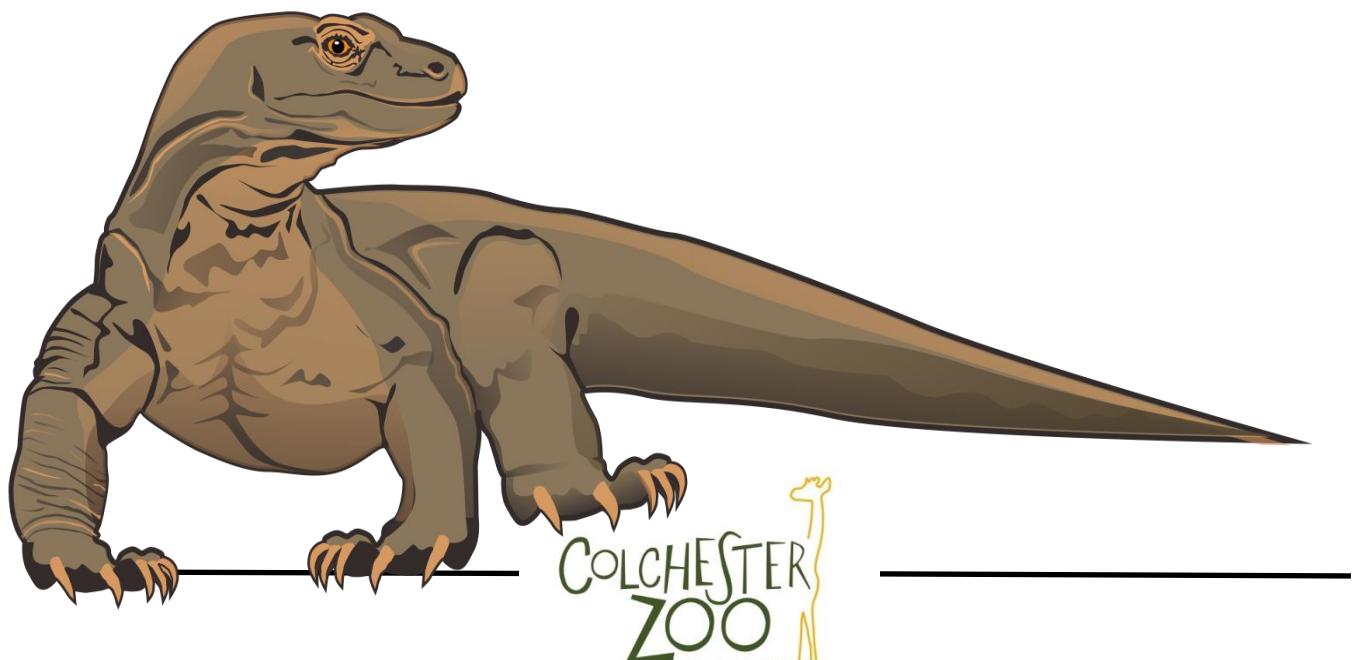
Status: Vulnerable

Komodo dragons are the world's largest, land-living lizard and can reach lengths of almost 3m. They are a member of the monitor lizard family. Their tail is longer than their body. They have a long, thick neck and flattened body with short legs and sharp claws on the end of their toes. The adults vary in colour from dark red through to grey black.

Komodo dragons use their long yellow tongue and keen sense of smell to find their food, usually rotten, dead animals. They can smell rotten food from almost 10km away. They are mainly scavengers but will also hunt animals such as pigs and water buffalo. They use their serrated teeth to injure their prey. Within their mouths, they have deadly bacteria and a unique venom, all of which are put into the prey through the injury. The komodo will then watch and wait for its prey to slowly die of blood poisoning caused by the bacteria (and helped by the venom).

In the wild, their populations are currently stable but because Komodo dragons are limited to islands they are at risk from natural disasters (e.g. storms), and human activities (e.g. poaching and habitat destruction).

Colchester Zoo was the first zoo in the U.K. to breed Komodo dragons naturally aiding the Komodo dragon European Endangered Species Breeding Programme (EEP)





Helarctos malayanus

Sun Bears

Habitat: Dense rainforests

Distribution: South-eastern Asia

Diet: Termites, bees, other insects, honey, vegetation, fruit, nuts, birds and other small vertebrates

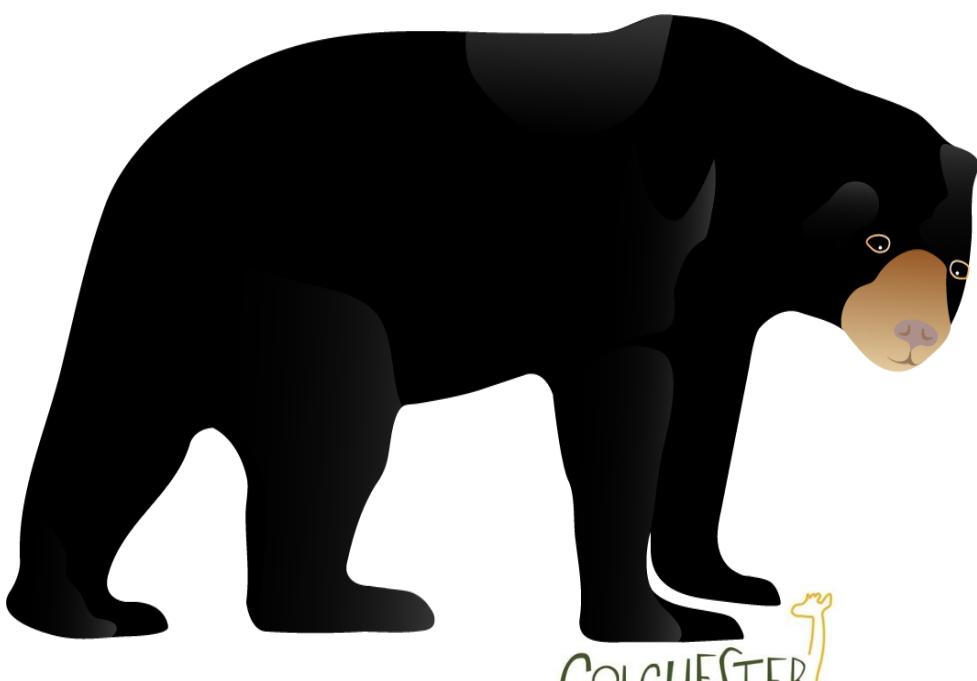
Longevity: Up to 25 years

Status: Vulnerable

Sun bears are the smallest of all eight bear species. They are called the ‘sun bear’ due to their white-golden crescent marking on their chest, which in ancient Eastern folklore, represents the sun. Another name for the sun bear is the honey bear, because they love honey (honey comb and bees as well!). The sun bear is excellent at climbing trees. The pads of their feet are smooth and hairless to help them grip, and their long claws help them grab while climbing. Their claws are also good for ripping open termite mounds and tearing apart bee nests to get food. Sun bears are most active at night, and during the day can be found sleeping and sun bathing in tree branches.

Sun bears are classed as vulnerable, and have rapidly declining numbers. Their main threat in the wild is habitat loss. They are a rainforest species, and the forest they live in are cut down for wood products and clearing land for farming. They are also illegally hunted, for use in bear paw soup or traditional medicine (which uses bear gall bladders). Because they are so small, they are also targeted by the illegal pet trade.

Colchester Zoo has two sun bears which are part of an international breeding programme.



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Pongo pygmaeus

Bornean Orangutan

Habitat: Tropical rainforest

Distribution: Borneo and Sumatra

Diet: Mainly fruit, also leaves, bark, nuts, eggs and small vertebrates

Longevity: Up to 35 in the wild, and 50 in captivity

Status: Critically Endangered

The name orangutan means ‘man of the woods’ from the Malay words: orang meaning ‘man’ and utan meaning ‘forest’. Orangutans are very well adapted to life in the rainforest. Their long red-orange fur helps camouflage them (red is hard to see in rainforests, because red light is absorbed by the green leaves). They have long arms (almost twice the length of their legs), perfect for swinging through the forest. Their hands and feet are large and curved, providing them with excellent grip. Adult males have facial flanges and a large throat pouch. These help the males make extra loud noises when they communicate with other orangutans far away in the forest. This communication is usually about territory, since orangutans are usually solitary (unlike the other great apes: chimpanzees, bonobos and gorillas). Orangutans are highly intelligent, using leaves as umbrellas and sticks to catch fish.

Orangutans are critically endangered. Their major threat is habitat loss, which is especially problematic because the only place they live are the islands of Indonesia. The rainforests of Indonesia are being cut down to create unsustainable palm oil plantations. This is a very high profit crop with the oil being used in many foods and household items





Visayan Spotted Deer

Habitat: Tropical rainforest, woodland forest, grassland

Distribution: Philippine Islands of Negros and Panay (Visayan Islands)

Diet: Grasses, leaves and bud

Longevity: Suspected maximum of 15 years

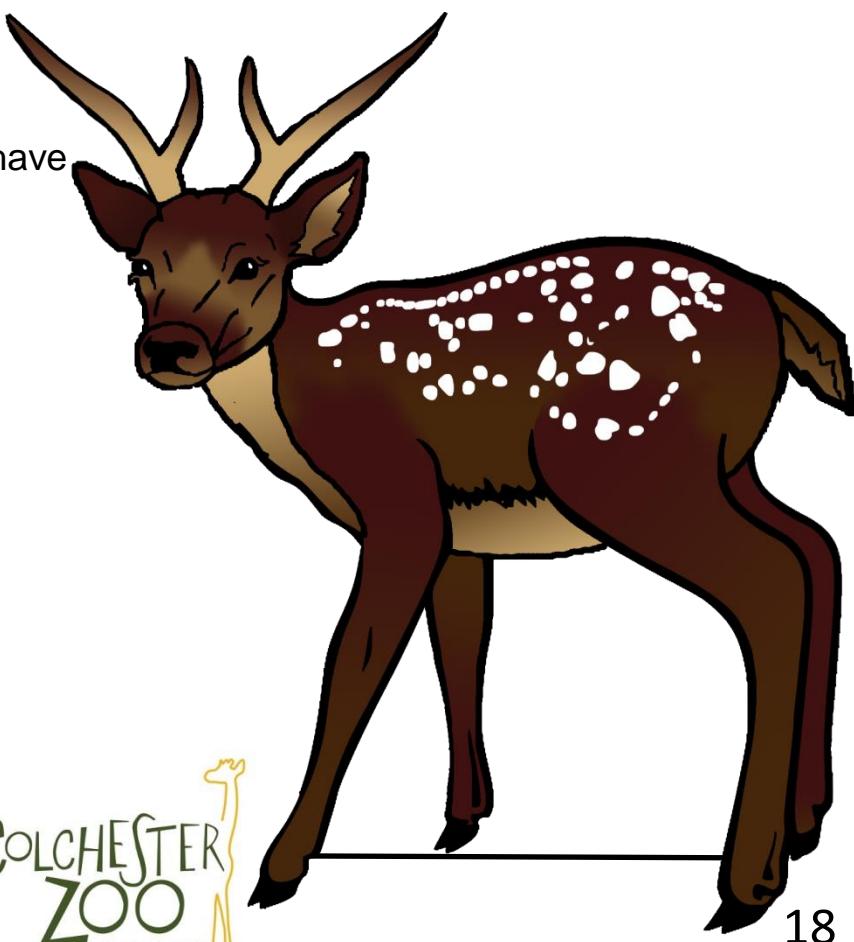
Status: Endangered

The Visayan spotted deer (also called the Philippine spotted deer) is one of the most narrowly distributed mammals in the world. They only live on two of the Visayan Islands. Their rainforest and woodland habitat has been extensively cleared for farm land. Due to this they are estimated to be extirpated from 95-98% of their former range.

They are comparative small deer, only 80cm tall. They prefer dense forest habitat and are nocturnal. Due to this, very little is known about them and they are hard to manage. This lack of knowledge makes population estimates difficult, and some estimates are as low as 300 individuals in the wild, while more conservative estimates are as high as 2,500.

The major threats to the species are habitat loss and hunting. Despite legal protection, this species is still intensively hunted by local farmers for food, and recreational hunters for trophy antlers. There is also demand for these small deer as pets, so many are captured from the wild. Their habitat continues to be loss due to illegal logging and agricultural expansion.

Colchester Zoo's
Philippine Spotted Deer are part
Of an international breeding
Programme. And to date, there have
been two fawns born





Leontopithecus rosalia Golden Lion Tamarin

Habitat: Rainforests

Distribution: Eastern Brazil

Diet: Mainly fruit, flowers, tree sap, leaves and insects

Longevity: About 10 years in the wild, up to 18 in captivity

Status: Endangered

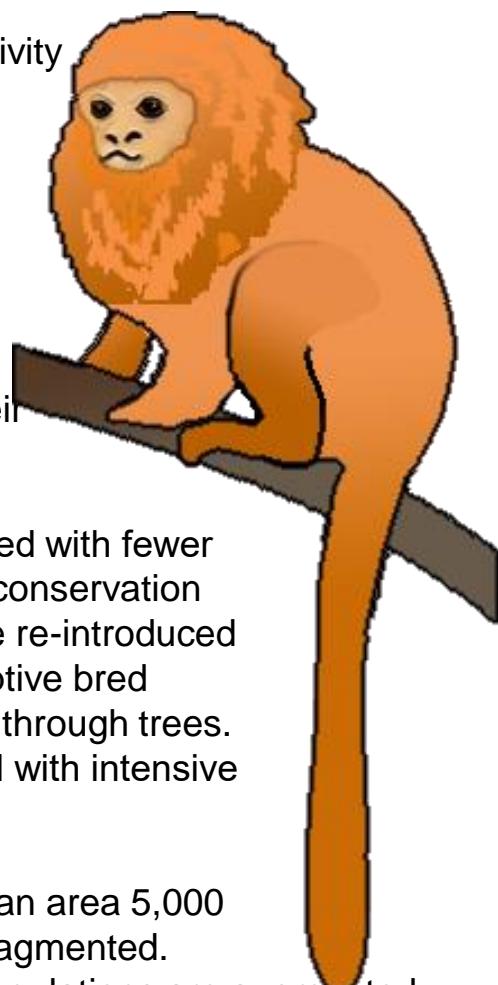
These tiny monkeys are only 40cm in length (including tail!). They have silky gold fur and a large 'mane' of fur around their face. Like all the tamarins they live in monogamous pairs, which is unusual among the primates, and usually rear twins. The offspring may remain in the group, even when adult, and help rear their younger siblings.

In the early 1980's, this species was critically endangered with fewer than 400 in the wild and 80 in captivity. After extensive conservation efforts and breeding programmes, captive animals were re-introduced into the wild. Initially there was high mortality as the captive bred individuals had problems foraging for food and jumping through trees. By the mid 1960's over 130 animals were released, and with intensive conservation, the population in the wild was over 600.

The species is still endangered since it is only found in an area 5,000 km² in the wild, and this remaining habitat is severely fragmented.

Although the situation seems to be improving as wild populations are augmented by captive-bred individuals (1/3 of wild species originated from captive stock), there remain a number of threats to the species in the wild, and the continuation of conservation activities is essential to ensure that the enormous successes seen to date are not undone.

Colchester Zoo has a number of Golden Lion Tamarins, which live in a group. The largest group of them can be seen in the Worlds Apart exhibit.





Panthera tigris ssp. altaica

Amur Tiger

Habitat: Tundra, deciduous (woodland) forest, and coniferous forests

Distribution: Amur-Ussuri region of eastern Russia

Diet: Large herbivores such as wild boar, deer and elk

Longevity: 17 years in the wild, longer in captivity

Status: Endangered

The Amur Tiger, formally known as the Siberian Tiger is the largest of the five tiger species and the largest of all the big cats. Males weighing around 363 kg and measuring up to 3.4m in length (nose to tail). Females are smaller at only 226 kg.

The Amur Tiger is well adapted to life in the cold. It lives in an environment where temperatures can drop as low as -40 °C.

It has a thick fur coat and layer of fat underneath the skin to insulate it from the winter snow. The tiger's stripes act as camouflage, which helps them blend into their forest environment. This camouflage is essential for stalking animals such as Sika deer and wild boar.

The Amur Tigers is one of the most endangered species of tiger. Their population continues to decrease due to illegal poaching and habitat loss. Poaching is for their thick fur, as well as body parts. Their body parts are used in traditional medicine. Almost every part of the tiger is believed to be a medicinal cure for a range of ailments ranging from fever to skin disease. There is no scientific proof that any of these body parts has any medicinal benefit.

Another major factor which is causing the decline of tigers in Russia, is habitat loss. More and more land is being developed for farmland, human habitations or just logged for timber. This not only a problem for the tigers but also for their prey such as wild boar and deer.

Colchester Zoo's tigers are part of an international breeding programme.





Panthera pardus ssp. orientalis

Amur Leopard

Habitat: Deciduous (woodland) forest, and conifer forests

Distribution: Far eastern Russia along the Russia-China border

Diet: Deer, hares, badgers and other small mammals

Longevity: 10-15 years in the wild and up to 20 years in captivity

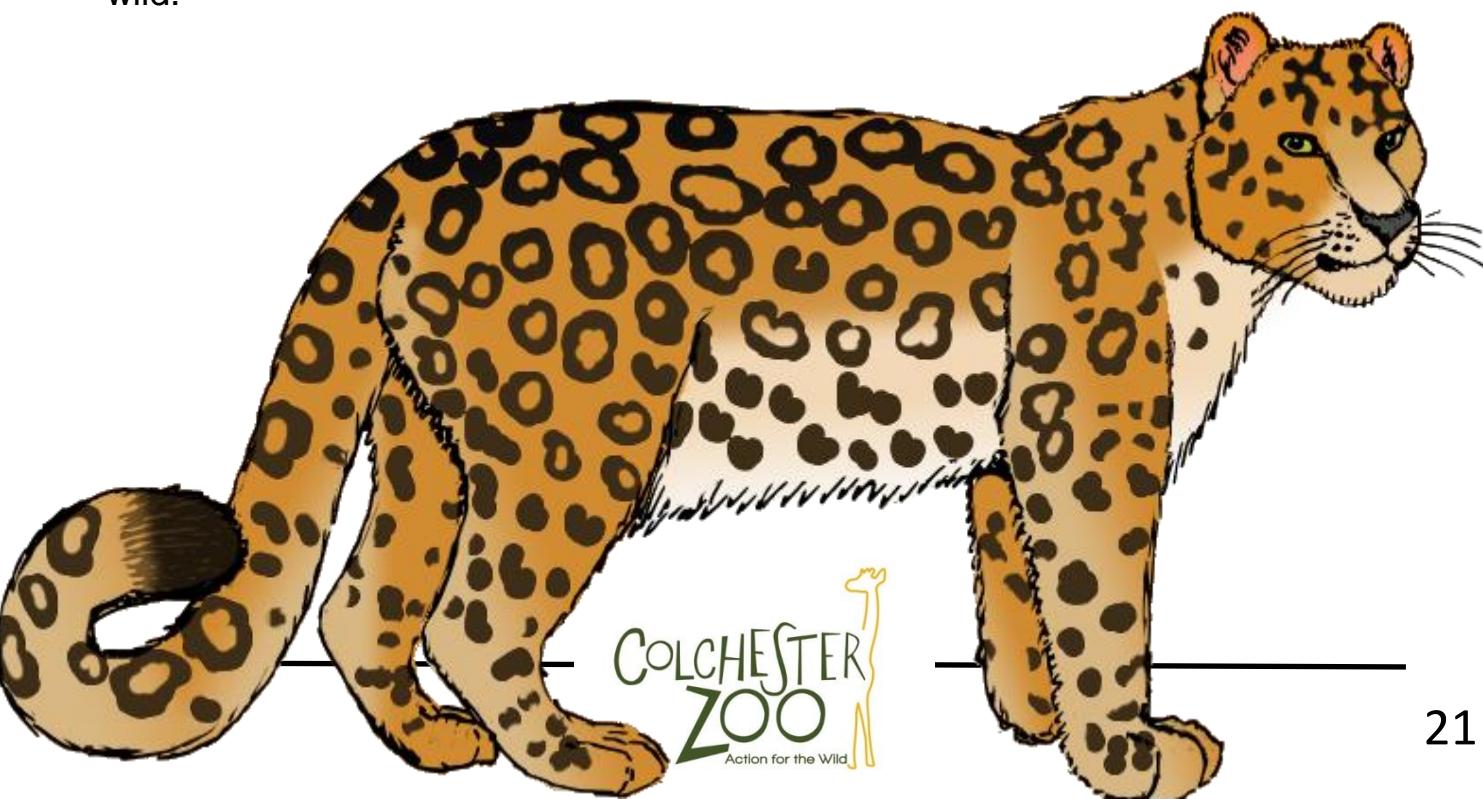
Status: Critically Endangered

The Amur leopard has the most distinctive markings of any of the leopard subspecies. The fur changes from pale cream in the winter to reddish-brown in the summer. The body and sides are covered in widely spaced, large rosettes (open spots) with a thick unbroken border and darkened centres. The head is covered in many small spots, which become larger on the legs and stomach. They are solitary and hunt mostly at night, using a stalk and ambush technique. Amur leopards are strong climbers and may even take their prey up into the trees to eat.

They have large home ranges which will vary in size depending on the availability of their prey, the more prey available, the smaller the range. Amur leopards use a distinctive rasping call for communication rather than the growl of the other cats.

Amur leopards face a number of threats. They are hunted for their fur and for use in traditional medicines. Their habitat is also being destroyed causing depletion in their prey. Their small population size also puts them at risk from catastrophes such as fire, disease and inbreeding problems.

There are two Amur leopards at Colchester Zoo. This male and female pair are house separately in adjoining enclosures to mimic their solitary behaviour in the wild.



Pre-Trip Classroom Ideas:

These are ideas to help prepare your class for a unit about endangered animals. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. Learn vocabulary words with students (see next page for list)
2. Discuss the term 'endangered'. For older pupils investigate different levels of conservation status: extinct, endangered, threatened, least concern, etc. Have pupils research how and why different animals and plants have gone extinct.
3. Have students create food chains showing connections between endangered animals and other animals in the same ecosystem. Students will need to research animal diets and ecosystems.
4. Pupils can research an endangered animal. Using this information, they can campaign for their species: design posters, hand out informational pamphlets, have a fund-raiser (donate money to a wildlife organization), write letter to government officials and local newspapers.
5. Cut pictures from magazines, or find pictures online and make a class collage of animals they want to see at the zoo. The collage could focus on animals with similar adaptations, animals that live in the same habitat, etc.
6. After learning about extinction, pupils can express their own feelings about endangered species (potential activities include: poetry, short stories, play, sculpture, or painting).
7. Read about what animals need to survive in their habitat. Pupils can design a zoo living space for their favourite animal. Make sure all the animal's needs are met. Follow this up at the zoo by investigating the enclosures and seeing how they compare.

Pre-Trip Classroom Ideas:

Vocabulary Words:

Captivity: Kept in confinement or otherwise controlled environment

Camouflage: Colours and patterns that help animals blend into its surroundings

Carnivore: An animal that mainly eats meat

Deforestation: Removal of forest trees to use the land for something else (e.g. farms)

Ecosystem: The complex community of interacting plants and animals in a specific habitat

Endangered: Very few left, it faces major threats, and it might go extinct (see previous page for full category descriptions)

Extinct: All of that species is now dead; it is no longer found anywhere

Extirpated: A species which is extinct in one specific area, but still found elsewhere in the world (e.g. wolves are extirpated from the UK)

Habitat: The type of place an animal lives (e.g. savannah, rainforest, etc.)

Herbivore: An animal that mainly eats plants

Invasive Species An animal removed from its native environment (on purpose or accidentally) and placed in a new environment where it takes over (e.g. rats, rabbits, etc.)

Omnivore: An animal that eats plants and meat

Pesticides: Chemicals used to kill various pests (typically insect and rodent agricultural pests)

Poaching: Illegal hunting of animals

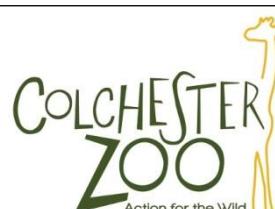
Pollution: Anything which doesn't belong in nature and is put there, including: light, chemicals, sound, litter, etc.

Predator: An animal that hunts and eats other animals

Prey: An animal that is eaten by other animals

Scavenger: An animal that feeds on dead animals

Species: A group of animals that have similar characteristics and can produce offspring.



Pre-Trip Classroom Activities:

Palm Oil

Students can explore how many things they use on a daily basis contain palm oil, and makes them aware of how important buying sustainable products is for helping endangered animals.

Time: 30 minutes, or a homework task

Subjects: Science, Citizenship

Materials Required: diary sheet, list of palm oil names, empty products that students bring from home.

Discuss with your pupils where palm oil comes from, and what it is used for. How is this mass farming affecting wildlife and endangered species?

Set your class the challenge of keeping a diary of all products they use that contain palm oil. You can provide them each with the list below to help identify palm oil in the products they use at home. This will highlight how many every day items they use that rely on palm oil. Get the pupils to collect empty containers and packaging of objects that contain palm oil. These can be brought to class and put on display in a shopping basket.

Get the class to investigate which of these products have been created using sustainable palm oil: look for any logos on the packaging that may suggest this. Ask the class to discuss how they can help animals that are being affected by unsustainably farmed palm oil: by buying more products featuring the logo, writing letters to different companies asking them to use sustainable oil etc.

INGREDIENTS: Vegetable Oil, Vegetable Fat, Palm Kernel, Palm Kernel Oil, Palm Fruit Oil, Palmate, Palmitate, Palmolein, Glyceryl, Stearate, Stearic Acid, Elaeis Guineensis, Palmitic Acid, Palm Stearine, Palmitoyl Oxostearamide, Palmitoyl Tetrapeptide-3, Sodium Laureth Sulfate, Sodium Lauryl Sulfate, Sodium Kernelate, Sodium Palm Kernelate, Sodium Lauryl Lactylate/Sulphate, Hydrated Palm Glycerides, Etyl Palmitate, Octyl Palmitate, Palmityl Alcohol
CONTAINS: oil

Pre-Trip Classroom Activities:

Food Chain Go Fish

This card game is a fun way for pupils to learn about food chains.

Time: 30 minutes

Subjects: Science, art

Materials Required: A4 paper, scissors

Have your pupils work in pairs. Explain that they will be designing their own card game, a little bit like go fish. Each group now needs to brainstorm five different food chains of three plants/animals. If this is a new topic, go over some examples with the group, for older pupils, have them create their own. Remind them that all five need to be different. Potential food chain examples are:

- Sea weed—sea turtle—shark
- Grass—mouse—snake
- Pond algae—fish—alligator
- Acacia tree—giraffe—lion
- Rotten log—termite—sun bear

Give each pair 2 pieces of A4 paper. Each pair should cut their pieces of paper into 8 (so at the end they have 16 smaller pieces of paper). They should now label all of their cut out pieces out pieces of paper with each of the animals/plants on their food chain lists. The extra piece of paper can be used to create a label or instruction card for their game. Encourage the pupils to colour and decorate each card, have them draw the animal or plant.

After their cards are done, pupils can play a game of Go-Fish. Each person starts off with four cards and a draw pile. They then ask their opponent for an item that would complete one of the food chains (e.g. do you have the shark?). If they do, their opponent hands it over, if not they say “go fish” and they pick up a card from the draw pile. The first person to complete two accurate food chains with the game.

For a more complicated, or longer game, have pupils make 10 different food chains (with 4 pieces of paper, and 32 cards), or put two groups together so that four pupils are playing with two decks.

Pre-Trip Classroom Activities:

Frog Life Lottery

Frogs, and other amphibians, are one of the most endangered group of animals in the world. This activity demonstrates how difficult it is for a frog to survive, and how important human action is to their survival.

Time: 15 minutes

Subjects: Science, Citizenship

Materials Required: Set up numbered cards (1-30) one for each student, lottery key

Amphibians have existed on earth for about 300 million years, yet within the last several decades more than 120 species are believed to have gone extinct forever due to human activities. When you're at Colchester Zoo you can visit numerous frog species around the zoo, most of which are endangered.

In 2006, a 442 species of amphibians were listed as critically endangered, 738 were endangered and 631 were listed as vulnerable. Overall 1 in 3 amphibians are at a risk of extinction! That number continues to go up. The largest threat to amphibians is habitat loss, responsible for approximately 1,800 endangered species of amphibians.

Provide each student with a lottery ticket (a piece of paper with a number 1-30 on it). If there are more than 30 pupils, get them to share cards, if there are fewer than 30 pupils, ensure a pupil gets the winning ticket (#20). The activity is more fun if the pupils all stand in a circle and actively participate, but will also work sitting at desks. After handing out the cards tell the participants that they are all frog eggs. The teacher slowly reads through the lottery key, explaining the horrible things that could happen to the frog eggs. It works best to read the number after reading the description. Get the group to sit down, or alternatively perform a dramatic death scene, as they die so everyone can watch the declining population.

For older pupils, as an extension tie the game into a discussion of K-life strategies vs. L-life strategies and why each is beneficial in its own way.

Pre-Trip Classroom Activities: Frog Life Lottery Key

Hand out lottery cards to all participants, read through the cards in order, explain what happens and then reading the ticket number

Egg: a female frog may lay 1,000 eggs, but only a handful of these will survive to become breeding adults. A developing frog faces numerous threats throughout its life cycle.

- 5 Acid water from pesticide run off. You fail to develop.
- 1 A dog picks up the branch you are attached to. You dry up and die
- 7 Children are playing in the pond, you are covered in mud and suffocate.
- 26 Your water is not clean, you get mould which rots your tail before killing you
- 19 Fertilizer runs into your pond causing an algae bloom, you suffocate!
- 27 A hose is turned on and water flows into your pond. The chlorine kills you.
- 13 Your pond dries up before you can hatch.
- 12 Mountain bikers splash through your pond and you get squashed.
- 18 Your pond gets polluted by litter, the chemicals kill you.
- 21 The plants at the edge of the pond are removed, the water gets too hot and you die.

Tadpole: you have reached the next level! You have a disc-shaped mouth to eat pond algae and other small plants. You breathe through gills, and use your long tail for swimming. After you develop legs you start eating meat.

- 3 Invasive Canada Geese pollute the water with poop, you can't breathe and die.
- 8 You were caught by children who did not return you to the pond.
- 22 Your pond is drained! You die.
- 2 Pesticides from nearby yards get into your pond and you are killed.
- 14 Invasive Water hyacinth covers the surface of your pond, you suffocate.
- 24 Nearby road construction causes silt to flow into your pond, you suffocate.
- 25 An infection wrecks your ability to balance water in your body – you explode
- 11 You are eaten by an invasive carp.
- 28 There are not enough bugs in the pond, you all turn cannibalistic and you are eaten.

Newly Emerged Adult: You have developed lungs, and strong back leg after reabsorbing your tail. Depending on your species, you might leave the pond. There are new dangers.

- 23 Your pond has high edges with no rocks or plants. You can't climb out and drown.
- 17 You tried to cross a road and were hit by a car.
- 9 Frogs infected with fungus are turned loose in your pond, you die.
- 10 Your pond is surrounded by a car park, no habitat for adult frogs.
- 4 The nearby trees are cut down and you overheat in summer. You bake.
- 29 You are infected by Ranavirus (red-leg) and the virus kills you
- 15 The trees are cut down and you have no shelter in winter. You freeze.

Adult Frog: You have survived one year of life. You are ready to breed. This is an extremely dangerous time for you.

- 6 You return to your pond to find it filled in, there is nowhere to lay eggs.
 - 16 There is no vegetation to attach your eggs to. Your eggs die.
 - 30 You are caught and eaten by a cat.
- 20 CONGRATULATIONS!
You have successfully survived as an adult frog and laid eggs.

Pre-Trip Classroom Activities:

Extinction Timeline

To learn how and why different animals and plants have gone extinct through time.

Time: 30 minutes—1 hour research, longer to share results with the class

Subjects: Science, Citizenship

Materials Required: images of different extinct species.

Before this activity, discuss what Extinction means with your pupils. Explain that animals, as well as plants, have been going extinct for millions of years. Look at how humans have impacted on the world and have caused many things to go extinct in a very short space of time. Split the pupils into pairs and provide each with an image of an extinct animal (e.g. a Velociraptor, a mammoth, a Quagga, a dodo etc.) Have them research their chosen animals, focusing on the following:

Where— Where did these animals used to live?

When— In what time period did these animals go extinct?

What— What things were happening on the planet this time? (e.g. dramatic changes in climate, human evolution, western exploration)

How and Why— Was their extinction a natural process, or was it the fault of humans?

Once the pupils have finished researching their chosen animal, have them arrange themselves along a time line (this will have to be carefully structured as obviously the dinosaurs went extinct millions of years ago). Get the pupils to discuss the different patterns and trends they see in the timeline. Why did so many things go extinct millions of years ago? What effect has climate change had on the planet? What has happened since modern humans have inhabited the planet?

Pre-Trip Classroom Activities:

The Aliens have Arrived

To learn about the threat of invasive animals with reference to animals not native to Britain and their impact on local species.

Time: 30 minutes—1 hour research, longer to share results with the class

Subjects: Science, Citizenship

Materials Required: an invasive species data sheet for each student, several natural history guides on plants and animals

Animals and plants introduced into Britain by humans often cause problems. These invaders can often take over food, shelter and space of native species. The Eastern Gray Squirrel has taken over habitat from native squirrels, and even worse, it carries squirrel pox, deadly to native species. Canada Geese pollutes waterways with its waste, creating nitrogen blooms which kill off many freshwater species. Rhododendron out competes native plants while providing little habitat value for native animals, even worse, it produce a toxin which stunts the growth of nearby native species. Other potential invasive species to research include: American mink, black rat, European rabbit, black bullhead, common carp, rainbow trout, and various deer species.

Have students work independently or in small groups to research an invasive species. If possible, allow students the opportunity to observe their species in the wild, either on a school trip, in the school yard, or through pictures and videos on-line. Have students complete their data sheets, and gather any other additional material.

Students or groups should present their findings to the class. This is a great way to introduce basic scientific paper writing, or having them design and create scientific research posters.

Extension activity: take part in an invasive species removal community project as a group (i.e. removing Rhododendron bushes)

Pre-Trip Classroom Activities: The Aliens have Arrived

Invasive Species Notes

Study Subject: _____

Scientific Name: _____

Specimen Location (where did I find or observe my specimen)? _____

Specimen Description: _____

Draw a detailed specimen sketch on the back of the page.

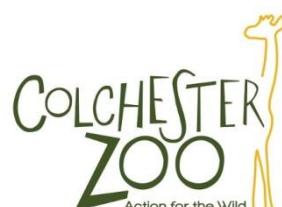
Origin of my specimen (where did it come from)? _____

Immigration story (how did it get here)?

Current status (what is its effect on the community? Has it taken over? Is it a serious pest, why? Does it provide any positive benefits?)

Reasons for success (why does it do so well)?

How to stop it (are there any current programmes or anything you would recommend?)



At the Zoo Ideas:

These are ideas to help your class focus during their trip to the zoo. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. Use the worksheets in this pack to help focus your students.
2. Encourage students to spend time observing the animals. Some unique animal behaviours can only be seen if we watch very carefully.
3. Have students make a detailed sketch of a zoo animal, sketching encourages careful observation.
4. Take photos of the animals and around the zoo. When you get back to school make a photo scrapbook of your trip, or use the photographs to produce presentations or posters about the visit.
5. Attend the feeds, shows or talks and have your students take notes. The keepers will tell you about the animals, and their threats. Often the keepers are available after to ask questions if you want to learn more.
6. Observe the enclosures to determine what makes a good home for an animal. Pay attention for anything that looks like it's entertain to the animals, zookeepers call they things enrichment. Enrichment for animals includes: wrapped boxes, toys, interesting smells, strange things (e.g. wellington boots, old brooms, etc.).
7. Pupils can examine the animal enclosure and determine, if they were an animal at the Zoo, which enclosure would they want to live in? Why?
8. Divide students into groups and have each group record down the name and threats of endangered animals they see (information is on all the enclosures). Which group can find the most endangered animals?

At the Zoo Activities:

Camera

This activity gets students focusing quietly and independently, and works well when pupils are taking real photos to get them to decide what to take photos of beforehand.

Time: 15 minutes or more

Subjects: Art, ICT, observational Science skills

Materials Required: Cameras (optional), small bits of card (optional), pencils (optional).

Before starting, take time to talk with the pupils to consider what make interesting subjects for good photos. Should they take close up images? Are walls interesting? Is it easier to take photos of an animal that moves a lot or an animal that's resting?

Find an animal that the pupils can stay focused on rather than get over excited when they see the animal. Divide the pupils into pairs. Within each pair one student takes the role of photographer and one takes the role of camera. The child pretending to be the camera keeps their eyes closed while the photographer leads them to an interesting viewpoint.

The photographer chooses when the camera opens their eyes and takes a picture. A good way to do this is to have the photographer gently tap the camera on their shoulder to have them open their eyes. When the camera opens their eyes, their job is to try to remember and visualise everything they see in front of them: Do they see an animal? How many animals? What is the enclosure like? What textures do they see? When taking photos it's best if the camera only has their eyes open for 5-10 seconds, then closes them again. Have the photographer move the camera to a few different locations. Do they see different animals? Is there a slightly different view point? After they've taken a few 'photos' have them switch roles.

Optional: If the group has actual cameras, have them all select their favourite photo from their activity and see if they can capture it using their real camera/s.

Optional: for an extended activity, hand out small bits of card to each pupil. Explain that they are going to process the photos they took with their eyes. Have them select their favourite image they photographed (real or with just their eyes) and have them draw the picture on the card, just like a photo.

At the Zoo Ideas: What's the Danger

Subjects: Science

Animals are endangered for different reasons. Read information about threats to the animals on signs at their enclosure. Write the name of an animal that is threatened for each reason:

.Animal has only one or two babies at a time _____

.Animal needs a special place to nest _____

.Animal lives close to major cities _____

.Animal home changed to farm land _____

.Animal hunted for fur _____

.Animal killed because people don't like them _____

.Animal whose food is taken by people _____

.Animal who is killed for tusks or horns _____

.Animal is very, very rare _____

At the Zoo Ideas: Animal Description

Subjects: Science

It is (circle one):

Least Concern Near Threatened Threatened Endangered Critically Endangered

Because of: _____

It looks a bit like a: _____

It eats: _____

It lives in the
_____ habitat

In _____
part of the world

MY FAVOURITE ANIMAL IS...

It is the size of a (make a comparison): _____

A cool adaptation it has is: _____

Something very special about it is: _____



At the Zoo Ideas: Endangered Animal

Subjects: Science

Select an endangered animal at the zoo: _____

1. What are five interesting facts about this animal

1. _____
2. _____
3. _____
4. _____
5. _____

2. Where does it live in the wild? (Country) _____

3. Where does it live? (Habitat) _____

4. What does it eat? _____

5. What eats it? _____

6. How does this animal reproduce? How many young at a time? _____

7. Why is this animal endangered? (include multiple reasons) _____

8. What human actions have made this animal endangered? _____

9. What have humans done to protect them? _____

10. What additional things can people do to protect them? _____

At the Zoo Ideas: Animal Research

Subjects: Science

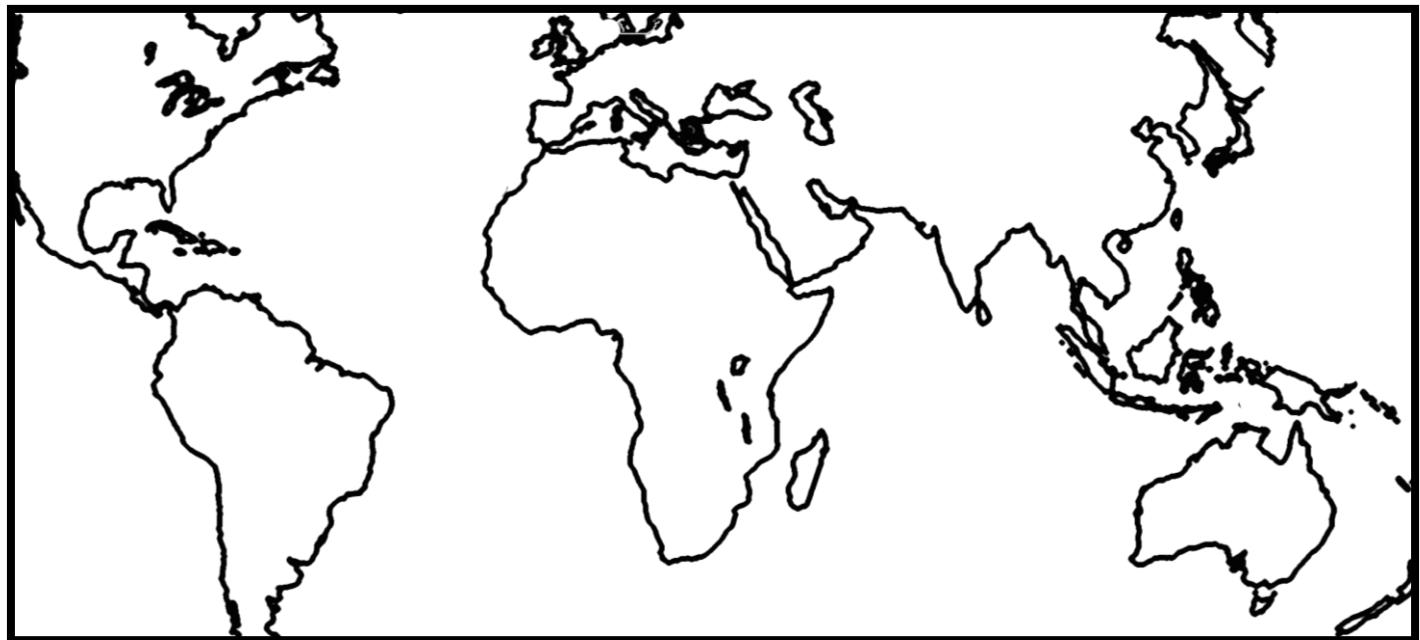
Name of animal: _____

Draw a picture of the animal on the back of this sheet

Type of animal (mammal, bird, etc.): _____

Size (record weight and height, can be an estimate): _____

Type of body covering (fur, feathers, scales, etc.): _____



Mark on the map where it lives in the wild

How does your animal get its food? (grazer, chases prey, browser, etc.): _____

What habitat does it live in: _____

How is it adapted to that habitat: _____

What is the future of your animal in the wild? Why?

Name of animal: _____

Observe your animal for 10 minutes.

Make a mark each time it does one of the following:

Walks/Runs	Eats	Drinks	Lies down
Sleeps	Yawns	Looks at people	Plays

How can you identify your animal from others in their group:

Which animal in the group is the leader? How can you tell?

What do you think the animal is thinking/feeling (is it hungry? bored? sleepy? etc.)? Why do you think that?

Many animals have things to do to keep them active. Can you see anything like that in your animals' enclosure?

Did your animal interact with it? _____

What would you give the animal to do and why? _____

At the Zoo Ideas: Elephant Watcher

Subjects: Science

Draw a map of the Zoo's elephant enclosure on the grid below.

Select EITHER the indoor or outdoor enclosure

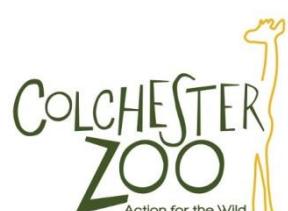
Show landmarks like their trees, ropes, and walls.

1	2	3	4
5	6	7	8

Pick an elephant to observe at the Zoo. Look at the signs nearby to identify the name of your elephant: _____

Every minute, record the time. Write the number of the grid where your elephant is. Describe what your elephant is doing.

Grid		
Time	Number	Observations



At the Zoo: Endangered Animal Spotter's Guide—Top End of the Zoo

On your trip to Colchester Zoo, check off these animals when you see them.

Read the sign at their enclosure to learn if they are threatened
(look for the words: rare, threatened, or endangered)

Squirrel Monkey



Threatened?

Green Anaconda



Sloth

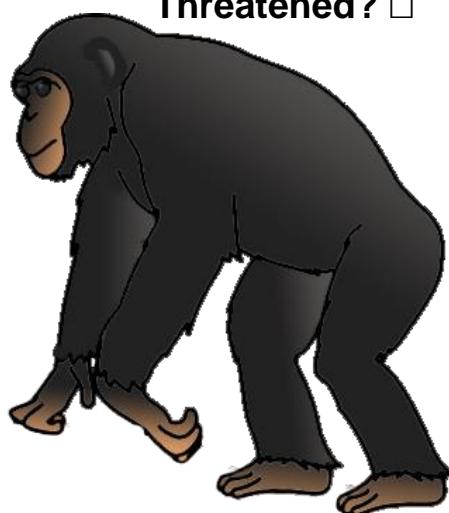


Orangutan



Threatened?

Chimpanzee



Threatened?

Green Iguana



Threatened?

Geoffroy's Marmoset



Threatened?

Humboldt Penguin



Threatened?

Sun Bear



Threatened?

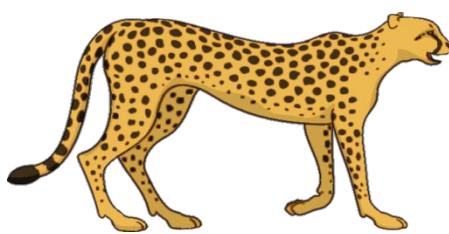
At the Zoo: Animal Spotter's Guide— Endangered African Animals

On your trip to Colchester Zoo, check off these animals when you see them.

Read the sign at their enclosure to learn if they are threatened.

(look for the words: rare, threatened, or endangered)

Cheetah



Threatened?

Lion



Threatened?

Hyena



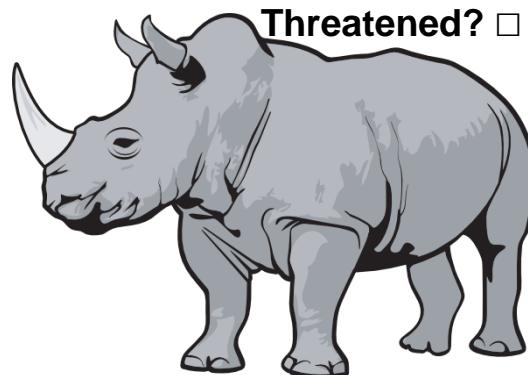
Threatened?

Ostrich



Threatened?

White Rhinoceros



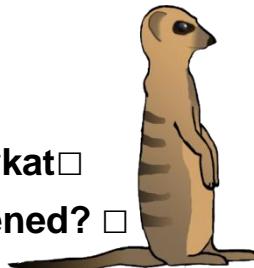
Threatened?



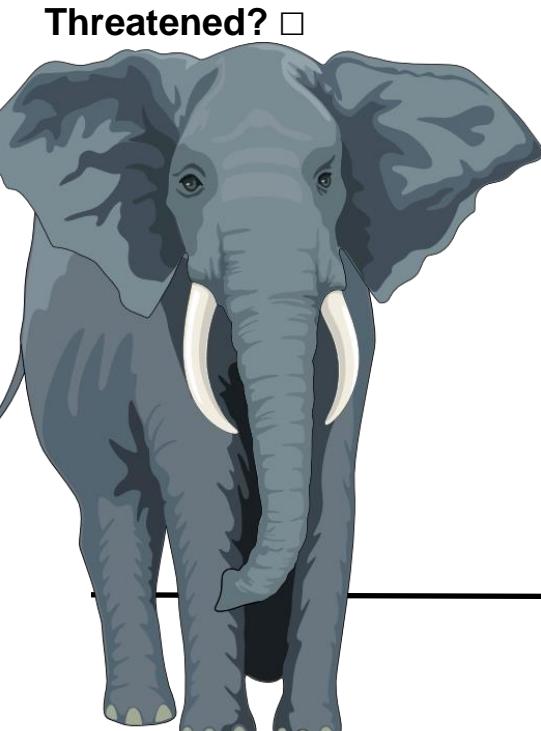
Fennec Fox

Threatened?

Meerkat



Elephant



Threatened?



Giraffe

Threatened?

Zebra



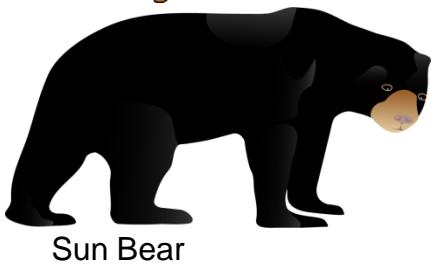
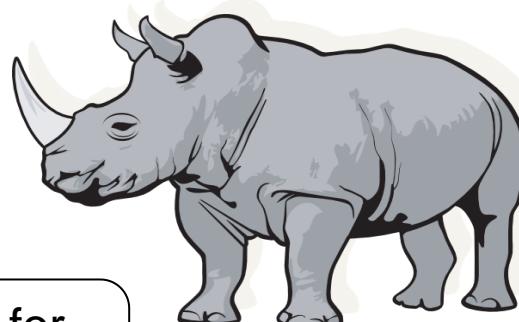
Threatened?

At the Zoo: Animals In Danger

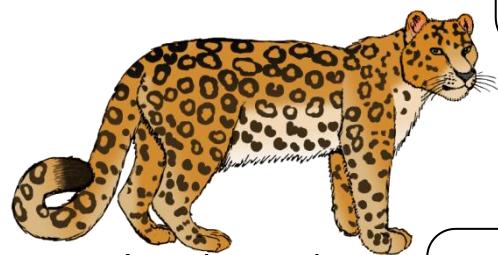
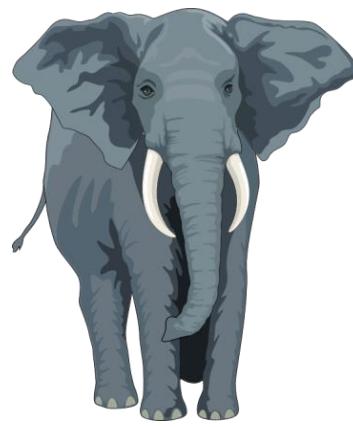
Draw lines matching the animals with the reasons they're threatened.
More than one animal might match each reason.



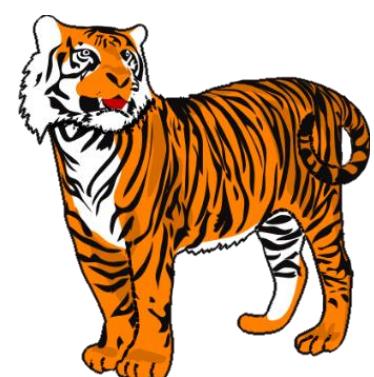
My rainforest home is
being cut down!



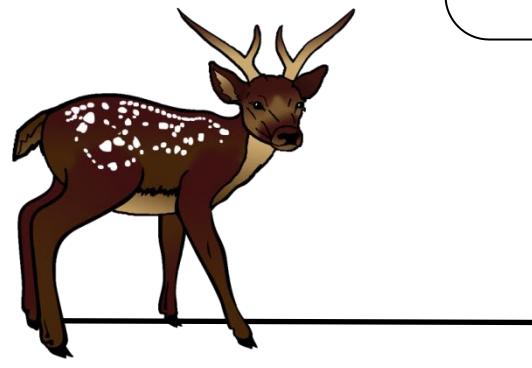
People use me for
medicine



I get tangled in fishing
nets.



I'm killed for my pretty
fur



People turn parts of
me into bracelets and
decoration

Bornean Orangutan



At the Zoo Ideas: Endangered Maths

Ages: years 5 and up (ages 9 and up)

Subjects: Science, Maths

Visit the Wilds of Asia exhibit and the surrounding area (hornbills, red pandas, etc.). Can you solve these maths problems?

1) Red pandas eat 1.5kg of leaves, and 4kg of bamboo shoots every day. Red pandas are threatened by habitat loss, since their bamboo forests are cut down, they don't have food.

- How many red pandas did you see? _____
- How much bamboo do they eat every day?

_____ kg

leaves

_____ kg

shoots

2) There are an estimated 70,000 pileated gibbons in the wild. However, due to habitat loss and poaching, their population is estimated to decline 50% by 2015.

- How many will be in the wild in 2015?
- How many gibbons did you see? _____
- If the zoo population declined by 50% how many pileated gibbons would there be?
- How many pileated gibbons did you see?

Zoo gibbon

population

3) Burmese pythons grow to be 7 metres long. They are threatened by poaching for food and for their skin. A unprocessed skin sells for £5 a meter. A processed snake skin bag sells for £5,000 (requires 3m of skin)

- How many Burmese pythons did you see? _____
- How much would their skin be worth if sold illegally?

£ _____

unprocessed

skin

£ _____

processed

skin

4) Philippine sailfin lizards are threatened by habitat loss and capture for the pet trade. Captured wild lizards can sell for £500.

- How many sail fin lizards do you see: _____
- How much would they sell for on the black market?

£ _____

black-market

price for sail

fin lizards

At the Zoo Ideas: Endangered Maths

Subjects: Science, Maths

Visit the Elephant and Giraffe paddocks and the surrounding area.
Can you solve these maths problems?

1) Elephants are killed for their tusks. People care the tusks into trinkets, jewellery and decoration. Illegal ivory (tusks) are sold for £100 per cm of ivory.

- How many elephants did you see? _____
- Estimate the length of their tusks: _____
- How much would their tusks be worth?

£ _____
worth of
ivory

2) Crowned cranes are threatened by habitat loss as the wetlands they live in are converted to farm land. In 2004 their population was 50,000. It is estimate to decline 60% by 2020. How many cranes will be left?

- How many crowned cranes did you see? _____
- If the zoo population declined 60% how many would be left at the zoo?

Wild crane
population

Zoo crane
population

3) Rhinos are threatened due to poaching for their horns. One large horn weighs 3kg. Their smaller horn weighs 0.5kg. How many rhinos do you see? _____

How much do all the rhino's horns weigh?

kg
of rhino
horn

4) People grind up rhino horn to use in traditional medicine. Rhino horn is made out of the same material as your hair and fingernails, it does not work. People pay a lot of money for rhino horn. 1 kg of rhino horn is worth up to £60,000.

- How much would the zoo's rhino horn be worth on the black market?

£ _____
worth of
rhino horn

5) There are a lot of reticulated giraffes. However, their population has declined and continues to decline in certain parts of their range. The main reason for their decline is habitat loss. In the wild, when looking for food, giraffes require large areas of land, up to 650km^2 per giraffe.

- How many giraffes do you see? _____
- In the wild, how much protected land would the giraffes need in order to find food?

km²

Post-Trip Classroom Ideas:

These are ideas to get teachers thinking about how to relate a school trip to Colchester Zoo to subjects back at school. Use these ideas as a starting point with or without the pre-made activities and worksheets on the next pages.

1. Have students choose a specific endangered animal they saw and conduct in-depth research based on what they observed.
2. Draw food webs for endangered species and discuss what will happen if the endangered species becomes extinct.
3. Create a 'zoo guide book' of your school trip to Colchester Zoo. Have students write article about the animals they saw, including pictures/sketches they made during the trip.
4. Design posers to help endangered species you saw at the zoo. Remind pupils to include lots of facts they learned as well as make it eye-catching and decorative.
5. Write stories from an endangered animal's point of view. The animal could describe: where it lives, what food it eats, how changes in their habitat affect them, what it's like to live near humans and what is happening to them.
6. As a class, research an animal that is already extinct. Some species, such as dinosaurs went extinct without humans. Many more are extinct because of humans including, the dodo, Steller's sea cow, quagga, passenger pigeon, great auk, moa, Baiji river dolphin, Tasmanian tiger (thylacine) and Carolina parakeet.
7. Have pupils imagine they are an endangered species (e.g. a white rhino or an Amur leopard) they saw at the zoo. Discuss if they would want to be in the wild or if they are happy being in captivity.
8. Take actions to help the environment and endangered species. Possible actions include: create a wildlife garden on school ground construct and install bird boxes, hold a tree planting day, hold a 'clean up' day at your school or nearby location, etc.

Post-Trip Classroom Activities:

Extinction is Forever

Pupils think about what extinction means and what people choose to protect.

Time: 30-40 minutes

Subjects: Science, Literacy

Materials Required: Extinction is Forever worksheet

Before this activity, learn about extinct animals and what extinction means. Have a group discussion about what extinction means and what they think extinction really means. Focus not on the literal (species gone forever) but more on the theoretical and emotional (why do we care when a species goes extinct).

Hand out the, Extinction is Forever worksheets to each pupil. Have them read the famous quotes. Certain words are bold in each quote, indicating the important words. Ask the pupils if they agree the bold words are the most important. Have them underline what they think are the most important words in the quote. After deciding on the important words, have them select their own important words and make a quote about their opinion on extinction. After they have all written their opinion, have the group share what they think.

Post-trip Activity: Extinction is Forever

Subjects: Science; Literacy

Read each of these famous quotes about extinction.

Certain words are bolded for emphasis, do you think they are the right ones?

Underline the words in each quote you think are most important.

After reading them create your own opinion about what extinction means.

"Extinction is the rule. Survival is the **exception.**"~ Carl Sagan

"An animal that is **very abundant**, before it gets extinct, it **becomes rare**. So you don't lose abundant animals. **You always lose rare animals**. Therefore, they're **not perceived as a big loss.**" ~ Daniel Pauly

"**We don't know** for sure **how many species** there are, **where** they can be found or how fast they're **disappearing**. It's like having **astronomy without** knowing **where the stars are.**" ~ Edward O. Wilson

"**Destroyed buildings** can be **rebuilt**; destroyed works of **art** may possibly be **replaced** by new creations; but every animal and every flower which becomes **extinct is lost forever** in the most absolute of all deaths." ~ Joseph Wood Krutch

"For millions of years, on average, **one species** became **extinct every century**....We are now heaving more than a **thousand different species** of animals and plants off the planet every year." ~Adams

"There are 23 species [of crocodile]. Seventeen of those species are rare or endangered. **They're on the way out**, no matter what anyone does or says..." ~ Steve Irwin

"People are **not going to care** about **animal conservation** unless they think that **animals are worthwhile.**" ~ David Attenborough

WHAT I THINK ABOUT EXTINCTION: _____

Post-Trip Classroom Activities:

Big Problems

In small groups pupils research specific problems endangered species face then share their findings with the group.

Time: 60+ minutes

Subjects: Science, Citizenship

Materials Required: research materials (e.g. school library, computers, etc.)

Divide the class into groups. Explain that there are many reasons animals are endangered. Assign a specific reason to each group to research. Allow the students time to research their problem then have them share their research with the group. Potential ways they could share their findings include presentations (PowerPoint or just verbal), posters, signs, displays, dioramas, text, etc.

Starting points for groups to research:

- How does the illegal ivory trade affect elephants? Was the ban on ivory useful? Did it protect elephants? How much does it cost to enforce an ivory ban? What other conservation efforts might be more useful?
- Why are crops grown in the rainforest? Some of the main crops grown there include: coffee, chocolate, sugar, palm oil, and rice. How many products do you use that come from the rainforest? Where else can these crops be farmed?
- What is illegal wildlife trade? Is this a problem in countries like the UK or only poorer countries? Why do people buy illegal wildlife products? Would more education at airports and other international travel hubs help?
- What is an exotic pet? Where do many exotic pets come from? Are they easy to look after? What happens to most exotic pets when their owners get bored? Why do people buy them? If people really want some exotic and interesting, can they do anything else or buy some equivalent and domestic?
- Why are tourists bad for coral reefs? But tourists bring in money, without tourist money, the reefs might not be protected. How can you balance the need to protect habitats while still earning enough money to protect them?
- What is an invasive species? Why are rats bad? What type of animal do invasive species harm the most? In what habitat? Are all non-native species invasive? What do cane-toads, European rabbits, and possums have in common? How can people fix this?

Post-Trip Classroom Activities:

Rainforest Impact Quiz

Test pupils knowledge of the rainforest while learning about the impacts of deforestation.

Time: 20-30 minutes

Subjects: Science

Materials Required: Rainforest Impact Quiz

Hand out the Rainforest Impact Quiz to each student. Have them write true or false next to each statement. After completing the quiz, they can switch quizzes with a partner to mark it. As you go over the answers, make sure to explain the ones that are false/true. This activity makes a nice introduction to talking about endangered rainforests and what we can do to help the rainforests.

- Cutting down the rainforest changes wind patterns around the world. **TRUE**
- Cutting down the rainforest changes rainfall patterns around the world. **TRUE**
- The rainforests are the lungs of the planet, they recycle carbon dioxide into oxygen. **TRUE**
- If the rainforests are completely gone, it won't affect us here in the UK. **FALSE** (as above)
- Across the world, 20 football pitches of rainforest are cut down every minute. **FALSE** Across the world an area the size of 90 football pitches is cut down in the rainforest every minute
- At current rates of deforestation the world's rainforests will be gone in 40 years. **FALSE** It is estimated that the rainforests could be gone by 2030!
- Rainforests are found on every continent. **FALSE** There are no rainforests in Antarctica.
- Rainforests cover over 50% of the earth's surface. **FALSE** Rainforests cover less than 2% of the earth's surface (most of the surface is covered by the oceans!)
- The Amazon Rainforests contains 1/5 of the world's freshwater in its rivers. **TRUE** Remember that the ocean's aren't fresh water; most of the rest is in the ice caps and glaciers with a little in large lakes
- There used to be 15 million km² of rainforest around the world. **TRUE**
- Now there is just 10 million km² of rainforest around the world. **FALSE** There are only 6 million km² of rainforest around the world over half the world's rainforest have been cut down.

Pre-trip Activity: Rainforests Impact Quiz

Ages: years 5 and up (ages 9+)

Subjects: Science; Literacy

TRUE or FALSE

1 Cutting down the rainforest changes wind patterns around the world.



2 Cutting down the rainforest changes rainfall patterns around the world.



3 The rainforests are the lungs of the planet, they recycle carbon dioxide into oxygen.



4 If the rainforests are completely gone, it won't affect us here in the UK.



5 Across the world, 20 football pitches of rainforest are cut down every minute.



6 At current rates of deforestation the world's rainforests will be gone in 40 years.



7 Rainforests are found on every continent.



8 Rainforests cover over 50% of the earth's surface.



9 The Amazon Rainforests contains 1/5 of the world's fresh water in its rivers.



10 There used to be 15 million km² of rainforest around the world.



11 Now there is just 10 million km² of rainforest around the world.



Post-Trip Classroom Activities:

Rainforest Products

A more in-depth explanation of rainforest products, which can be tied into concepts of deforestation, the loss of the rainforest and endangered rainforest animals.

Time: 20-30 minutes

Subjects: Science, Literacy, Geography

Materials Required: Coupon leaflets from shop (grocery store) with pictures of products, maps/globes/etc.

Explain to the pupils that many of the things we use every day come from the rainforest. Have them try and guess what comes from the rainforest (some might guess fruits, bananas, etc.). Write the answers on the board as they make suggestions. At the end, explain that there are other things, besides food that we get from the rainforest.

Divide the class into small groups. Hand out rainforest product sheets and coupon leaflets to each group. Explain that the rainforest product sheet lists some of the products that are often from places there used to be rainforest. Their job is to go through the leaflets and cut out every product they find which is on the rainforest product list. Remind them to think about derivates of products (e.g. something that is lime-flavoured probably uses some lime).

After they've cut out the rainforest product pictures, explain that the other side of the sheet lists countries of export. Explain that an export is when a country makes something and sells it to another country. Have them sort their cut out rainforest products, they should have four groups of products at the end: South American rainforest products, Africa rainforest products, Asian rainforest products, and products from multiple locations (e.g. Africa and South America)

For older pupils, or as an extension, have them find the specific countries these products come from. Older groups could also do additional research to determine what parts exactly come from the rainforest. For example, most shampoos contain coconut derivatives which help them lather.

As a group discuss how to solve the problem of cutting down the rainforest for these products. Should we stop using these products? Should we buy local products? Should we insist on rainforest friendly products (i.e. rainforest alliance, marked with a green frog logo)? What other ideas and options can the class develop.

Post-Trip Classroom Ideas: Rainforest Products

Product	Main location of Export:
Shower gel /bath foam / shampoo (sodium laurel sulfate)	Asia (Indonesia, Philippines, India)
Liquid hand wash (sodium laurel sulphate)	Asia (Indonesia, Philippines, India)
Moisturiser and hand cream (nut oils; coconut oils)	Asia (Indonesia); Africa (Namibia)
Cosmetics: lipstick, foundation and mascara (cacao seed; palm oil)	Africa (Côte d'Ivoire , Ghana); South America (Brazil, Ecuador); Asia (Indonesia, Malaysia)
Vegetable oil	Asia (Indonesia, Malaysia)
Rubber: car tyres, toys, shower mats, electrical wires, balls, etc.	Asia (Thailand, Indonesia, Malaysia)
Banana	India, Uganda, China, Philippines, Ecuador, Brazil, Indonesia
Mango	South America (Mexico, Brazil, Peru, Guatemala, Haiti)
Pineapple	Costa Rica, Philippines
Limes and Lemons	India, Mexico, Argentina, Brazil,
Chewing gum (chicle tree sap/gum base)	South America (Guatemala, Mexico)
Rice	Asia (Thailand, Vietnam, Cambodia)
Wooden furniture (teak, bamboo)	Asia (Indonesia and Myanmar)
Paper (made from rainforest wood)	Asia (Indonesia and Myanmar)
Coffee	South America (Brazil, Colombia); Africa (Ethiopia, Côte d'Ivoire)
Tea	Asia (Sri Lanka, China, India)
Sugar	Brazil, India, China, Thailand

Post-Trip Classroom Activities:

Animal Poetry

Pupils use their knowledge of endangered animals to write poetry.

Time: 15-30 minutes

Subjects: Literacy

Materials Required: None

Introduce the pupils to different forms of poetry, for example, haiku, cinquain, and acrostic. Show them the example poems. After the pupils are familiar with the concept, they should choose an African animal that they saw at the zoo. Using their memory and imagination they can try and write poetry about the animals they saw.

Haiku

Originating in Japan, the haiku is three line of poetry, following the pattern of five syllables, seven syllables and ending with five syllables. The lines do not need to rhyme. For example:

Fast, stripy zebra	(five syllables)
Running over savannah,	(seven syllables)
Cheetah is faster.	(five syllables)

Cinquain

Cinquain poems have five lines and have specific pattern. Word cinquains are based on the number of words in a line. For example:

Hyena	(one word—an animal)
Clever, cunning.	(two words that describe it)
Stalking wary antelope.	(three words expressing action)
King of the savannah.	(four words explain how you feel about it)
Predator	(sum up with one word)

Acrostic

These are poems where the first letter (or syllable or word, etc.) spell out a word or message. The easiest is spelling out the name of an animals (for older children try hiding messages).

For example:

Rhinoceros are
Hunted for their horns.
Included in medicine, even though there is
No point, rhino horn is not medicinal.
One day soon, they'll be none left.

Post-Trip Classroom Activities:

Ecosystem Tag

This is a running game that reinforces concepts about predators/prey and different levels in ecosystems.

Time: 20-30 minutes

Subjects: Physical Education, Science

Materials Required: arm bands (fabric strips to identify consumers and decomposers); energy chips (bits of card, pom-poms, etc.); pictures of different ecosystem levels

Before beginning this activity, review what an ecosystem is. Remind pupils of the different levels in food webs including producers (plants), consumers (most animals, e.g. sloths, parrots, monkeys etc.) and decomposers (insects, worms, bacteria, snails, etc.).

Divide the pupils into three groups: decomposers, consumers (twice the number of decomposers), and producers (twice the number of consumers) (e.g. 2 decomposers, 4 consumers, 8 producers). Set a boundary for the playing area representing the size of the ecosystem. The energy chips represent energy from the sun, there should be more of these than producers. Place these objects in a box/bucket/etc. in the centre of the playing area.

Each producer takes one energy chip from the box. They can only have one chip at a time, but if they lose it, they can get a new one from the box, because producers can make their own energy from the sun. Consumers get energy from eating producers. The consumers in this game tag the producers and are given their energy chip.

Consumers can hold as many energy chips as they can get. The decomposers want to take the energy from the consumers and put it back into the ecosystem. Decomposers take the consumers and take away ALL their energy chips. When decomposers have the energy chips they put them back in the box/bucket for the producers (plants) to use again.

When the game has been played for a while, ask the pupils how long the game could continue. The answer is forever! But what would happen if there weren't decomposers? Play again to find out what happens without one of the groups. At the end discuss how each group in the food web is important and has a specific role to play.

Post-Trip Classroom Activities:

Where in the World

Pupils learn where different endangered animals live.

Time: 20-30 minutes

Subjects: Science, Geography

Materials Required: Endangered Animals map

Before this activity, learn about different endangered animals. Pupils should also be familiar with the names of the continents.

Hand out copies of the map to each pupil. The pupils job is to draw a line connecting the animals to where they live. Next to the image of each animal is a general description of where the animal lives. If they know their names, or have already researched the animals, have the students label the names of the animals.

For older pupils, have them research the animals more specifically and find out exactly which area they live in (research the country they live in).

To make it more of an art activity, print two copies of the map for each pupil. Have them cut out the animals shapes and glue them onto the places where they live.

For older pupils, have them research the historic range of the animals and draw it on the map. Then have pupils research the current range of the animals and draw it over top, or on a second map. After drawing the historic and current range pupils can compare how much space these endangered animals have left.

Endangered Animals

55



Post-Trip Classroom Activities:

Conservation Debate—Orangutan

Pupils to role play different opinions about conservation.

Time: 20-30 minutes

Subjects: Science, Drama, Citizenship

Materials Required: Copies of opinions and questions for each group (or write on board)

Many rainforest animals are endangered and may go extinct. One of the main reasons they are endangered is due to deforestation (loss of habitat when the forest is cut down). Orangutans only live on the islands of Borneo and Sumatra. The rainforests on these islands are being cut down. When the rainforest is all gone, the orangutans will be extinct in the wild.

Divide your pupils into groups and assign one opinion to each group. Have them pretend to have that opinion and answer the questions (with the opinion of that person, not their own opinion). Next, mix the groups up, so one pupil with each of the opinion is in all of the new groups (one farmer, one ranger, one tourist). Have them debate their opinions in this new group and try and answer the questions again.

After the smaller groups have discussed their opinions, have each group share their answers with the entire class. What was each groups opinion? Did any of the groups have the same solution for the problem?

As an extension activity have pupils try determine other groups who might have different opinions about orangutans (other than farmers, wildlife officer, and tourists). Repeat the activity with more opinions. Does that make it easier or harder to reach a solution?

Post-Trip Classroom Activities:

Conservation Debate—Orangutan

Opinions and Questions

Borneo Farmer: My family is poor. I barely have enough food for my family. Sometimes I can sell extra eggs from my chickens, or get work in town. Even with that, I only earn £100-150 pounds a year. My farm is very tiny. If I cut down the nearby trees, I can make my farm a lot larger. If my farm is bigger, I can plant more crops and make more money. If my farm is bigger, I can maybe make £200 pounds a year farming, and I can sell the wood for extra money as well! Just think of what I could buy, food, clothing, medicine, maybe even toys for the children!

Orangutan Wildlife Officer: We need to protect the rainforest. We are working hard to educate people about the importance of rainforest habitat. We patrol and prevent capture of orangutans for pets. We find and save injured and sick orangutans. Many volunteers are working to help protect this animal. However, every year more and more rainforest is cut down. Soon, there will not be a home for the orangutan in the wild. If they don't have a home, nothing we can do will protect them.

UK Tourist: I've always dreamed of taking a trip to see orangutans in the wild. I'm going to volunteer at an orangutan orphanage when I'm there, and help the animals. I am saving up money for the trip because it is expensive to fly there, and I want money to donate to the animals when I'm there. But I need to go soon, before there aren't any orangutans left. If there were no more orangutans, I don't think I'd bother going.

Questions to think about:

- Do you think endangered species are more important than buying toys?
- Who should get money spent by tourists?
- How should the farmer make money?
- How would you solve the problem of cutting down the rainforest?
- Who would benefit from this proposal? Is it fair?

Post-Trip Classroom Activities:

Conservation Debate—Elephants

Pupils to role play different opinions about conservation.

Time: 20-30 minutes

Subjects: Science, Drama, Citizenship

Materials Required: Copies of opinions and questions for each group (or write on board)

Many African animals are endangered, and may go extinct. One reason they're endangered is poaching (illegal hunting). Elephants are poached for their ivory tusks, which is carved into jewellery, and ornaments.

Divide your pupils into groups and assign one opinion to each group. Have them pretend to have that opinion and answer the questions (with the opinion of that person, not their own opinion). Next, mix the groups up, so one pupil with each of the opinion is in all of the new groups (one farmer, one ranger, one tourist). Have them debate their opinions in this new group and try and answer the questions again.

After the smaller groups have discussed their opinions, have each group share their answers with the entire class. What was each group's opinion? Did any of the groups have the same solution for the problem?

As an extension activity have pupils try determine other groups who might have different opinions about elephants (other than farmers, rangers, and tourists). Repeat the activity with more opinions. Does that make it easier or harder to reach a solution?

Post-Trip Classroom Activities:

Conservation Debate—Elephant Opinions and Questions

African Farmer: My family is poor. I barely have enough food for my family.

Sometimes I can sell extra eggs from my chickens, or get work in town. Even with that, I only earn £150-200 pounds a year. We need money for seeds for the farm. When my children are sick I need extra money for medicine. Recently, a man told me he would pay me £500 pounds for a pair of elephant tusks! That's more money than I make in a year farming! Just think of what I could buy, food, clothing, medicine, maybe even toys for the children!

African Wildlife Ranger: We must stop illegal hunting at all costs. One elephant killed for ivory is too many! I've asked the government for stronger laws to protect the elephants and other game animals. There is so much money involved people are willing to do awful things. The poachers killing the elephants make a few hundred pounds, but the ivory dealers selling it will make thousands. The elephant is an important symbol of Africa. They are unique, beautiful and essential to the ecosystem. We must protect them at all costs.

UK Tourist: I've always dreamed of taking a trip to Africa to see the amazing wildlife. I'm saving money to go, because I know a good trip with an excellent guide will cost a lot. I'm happy to spend a lot of money because seeing these amazing animals in the wild is worth it. But I need to go soon before the animals become extinct. I'm most excited about seeing the Elephants. If there were no more elephants, I don't think I'd bother taking a trip to Africa.

Questions to think about:

- Do you think endangered species are more important than buying toys?
- Who should get money spent by tourists?
- How should the farmer make money?
- How would you solve the problem of elephant poaching?
- Who would benefit from this proposal? Is it fair?

Post-Trip Classroom Activities:

Earth Summit

To create awareness of conflicting points of views about the importance of conservation.

Time: 30 minutes, additional time for extension activities

Subjects: Science, Citizenship

Materials Required: Copies of "Earth Summit" statement for each pupil

In 1992, people from all over the world gathered together in Rio de Janeiro, Brazil, to talk about the future of the Earth's environment. At this Earth Summit, a special treaty was signed called The Convention on Biological Diversity. Over 150 countries, including the UK, signed this legally binding agreement that provides a framework for the conservation of the biological diversity of the plant, and the sustainable use of biological resources. The Rio Convention was a long time ago, but is still relevant, because it was the first global agreement to cover all aspects of biological diversity including genetic resources, species and ecosystems. It was also the first to recognise that the conservation of biological diversity is 'a common concern of humankind' and an integral part of sustainable development. One of the challenges of conservation among the countries of the world is resolving conflicts about land use.

Have students work with partners and read the statements. Students should then try and match each of the statements to one of the people listed at the bottom of the statement page. Each of these individuals make a legitimate point about the important uses of the resources of Brazil. The same type of conflict occurs in our communities about the use of land, and the conservation of endangered species and ecosystems.

The stakeholders are: timber merchant, small farmer, government official, spokesperson for the Kaipo Indians, engineer, business person, environmentalist, rubber tapper, meat marketer.

Extension: rather than just reading the statements, assign students the stakeholder roles to research and hold a simulation of a public meeting/ Rio Convention where students play the roles of the various points of view.

Post-Trip Classroom Activities: Earth Summit

Match the statements with the stakeholders.

A lot of our trade these days is in tropical hardwood – most of which come from the Amazon. These woods, like mahogany and teak, are used to make a variety of things. The demands for doors and windows these days is enormous. How can you stop this ever increasing demand? You can't. We have to meet the needs of our customers, and items like fitted kitchens which used to be luxuries for the rich are now available to all.	We buy beef from the ranchers of third world countries, giving them the opportunity to trade with us and earn foreign exchange.
I used to have a small plot of land in the north where I grew enough food to feed my family and some to sell to buy other things. Then a large company came and took over my land to grow sugarcane to make alcohol, a fuel for cars. I was forced to move to the city and live in the shanty town with no hope of a job. I have come to the rainforest because here my wife and I can start to farm again and make a new life for our family.	We are building four major dams in the Amazon. This will provide hydroelectric power for the smelting of bauxite to make aluminium, and will also provide electricity for the growing cities of Brazil. What else can we do? Brazil has no oil, but we have rainforests with valuable minerals and wood. How can we leave it along? The environmentalists say "don't touch it", but that's impossible. A modern society can't survive without energy.
It's all very well for people from European countries to criticise Brazil for developing Amazonia; they can afford to be idealistic, they are rich. Brazil is a country that is deeply in debt. Realistically, all we can do to pay interest on our loans is to use our natural resources to develop economically and raise the standards of living of our growing population.	Amazonia is rich in minerals which must be developed, timber for industry and the potential for hydroelectricity. Amazonia is a growing project – this is progress. In the near future the roads will be completed, the mining will be fully developed – the energy resources available to industry, and this will earn millions for Brazil. Industry is progress and it must continue and expand for the good of Brazil.
The tropical forests are rich in plants and animals. More than half the world's species live in them. Every day another animal or species of plant becomes extinct. The forests are also places of great beauty whose fragile ecosystems have taken thousands of years to evolve. We depend on them for our climate, our medicines, and our foods. We in other countries must put pressure governments to save the rainforests before it's too late.	I have to defend myself and all the rainforest people. We are the true Brazilians; we have lived in harmony with the forest for over 20,000 years. We are the only ones who know how to look after the forest. The white man is crazy; he is destroying the forest for short-term profit. What will his grandchildren do when the land has turned to dust?

We hope you enjoyed your trip to



Learning about Endangered Animals

