Activity Pack: Plants at the Zoo

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

COLCHESTER ZOO
Action for the Wild

How to Use this Pack:

This Plants at the Zoo Tour Guide Pack was designed to help your students learn about plants and prepare for a trip to Colchester Zoo.

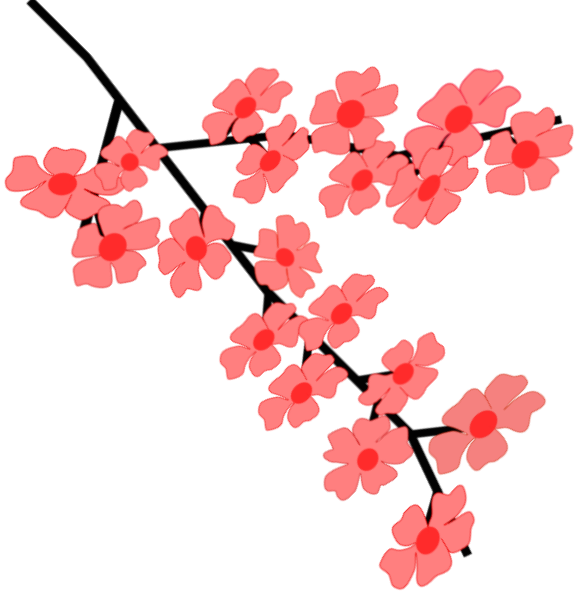
The pack starts with suggested key locations (with specific plants, etc.) to visit at Colchester Zoo including a map of these locations and which encounters/feeds to attend. The next section contains fact sheets about many of the plants found in these locations. This information will help you plan your day, and your route around the zoo to aid in completing activities and gather information. We recommend all teachers read through this, and give copies to adult helpers attending your school trip.

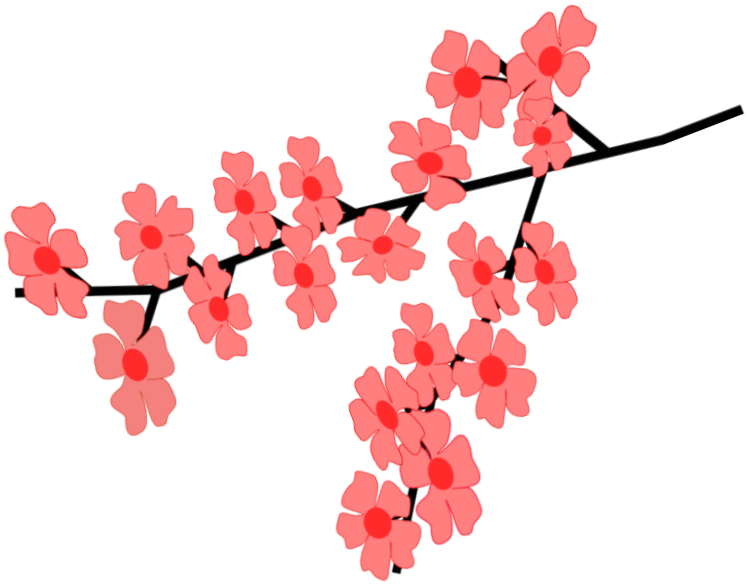
The rest of the pack is broken into: pre-trip, at the zoo, and post-trip. Each of these sections starts with ideas to help teachers think of ways to relate plants to other topics. Then there are a variety of pre-made activities and worksheets. Activities are typically hands on 'games' that introduce 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. Activities have the suggested age range and other information on the left-hand side of the page underneath the description. Worksheets have the suggested age and subject in the upper right-hand corner of the page. These are guidelines only. 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 and plants they will see during your trip. 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 help consolidate learning and 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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Places to go and See at Colchester Zoo:

Key Places to Go:

1. The garden at Familiar Friends.
2. Elephant Kingdom, elephant public feed area**.**
3. Kingdom of the Wild, giraffe public feed area.
4. Location of the larch tree (side of mixed African species paddock).
5. The Nature Area.
6. Location of the pine tree.
7. Location of the oak trees.
8. Location of the windmill palms.
9. Location of the weeping willows.
10. Location of the tree ferns.
11. Location of the monkey puzzle tree.
12. Location of the eucalyptus trees.

Please note that animals on display may change

Dicksonia antarctica

Tree Fern

Habitat: Damp woodland, gullies and cloud forests
Native to: Worldwide. The species at Colchester Zoo is from Australia

Found in Queensland through to New South Wales in Australia, this species of tree fern grows in areas that has between 500mm-1000mm of rain per year.

The name ‘tree’ is due to the fact that it can grow up 15 metres tall! However a more common height is 5 metres, with fronds (the green top part of the tree fern) having a diameter of up to 6 metres.

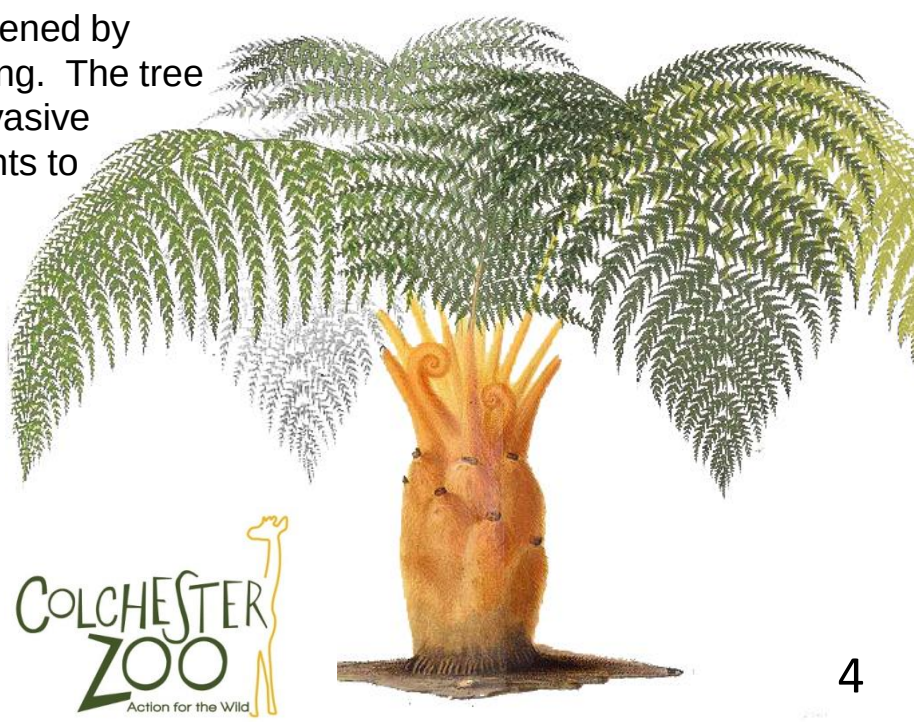
The ‘trunk’ of the tree fern is actually the remains of past growth. The roots of the tree fern comes from the fronds and pass through the middle of the trunk. This means the trunk is not attached to the ground. The trunk is also host to other ferns and mosses.

Tree ferns are slow growing, only growing an average of 3-5cm per year.

The tree fern provides shelter for smaller species of fern, which aids their growth and are thus an important species in the forest to ensure a diverse number of plant life.

Tree ferns are common as a garden plant in the U.K., due to it being able to cope with cold temperatures. The larger tree ferns being sold as garden plants are harvested in Australia and can be over a hundred years old, whereas smaller tree ferns are cultivated.

All tree ferns species are threatened by deforestation and over harvesting. The tree ferns are also threatened by invasive feral pigs which up root the plants to eat them.



There are several tree ferns around Colchester Zoo. The easiest ones to see are by the Komodo Dragons.

COLCHESTER ZOO
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Araucaria araucana

Monkey Puzzle Tree

Habitat: Mountain slopes up to 1000 metres above sea-level
Native to: South America

Found in the Andes mountain range in Chile and Argentina

The name monkey puzzle is thought to have come from when Charles Austin, "It would puzzle a monkey to climb that", when he viewed one of the few trees in the U.K. in 1850. Interestingly, monkey puzzle trees grow in a location in South America where no monkeys live!

Monkey puzzles are an evergreen tree that can grow to 40 metres tall and a long lived tree, with some over 1300 years old.

The species of tree is very old, and has been around for about 200 million years - when dinosaurs were still around. This means it is a more 'ancient' type of tree then any of the flowering plants, or any of the cone bearing conifer trees. The large spikey leaves of the monkey puzzle tree would have protected it from very large plant eating animals which have long since gone extinct.

The monkey puzzle is a hardy species and able to cope with prolonged cold periods as well as coastal conditions. This has resulted in the plant becoming a popular garden plant around the world. However, it does have a low tolerance to pollution.

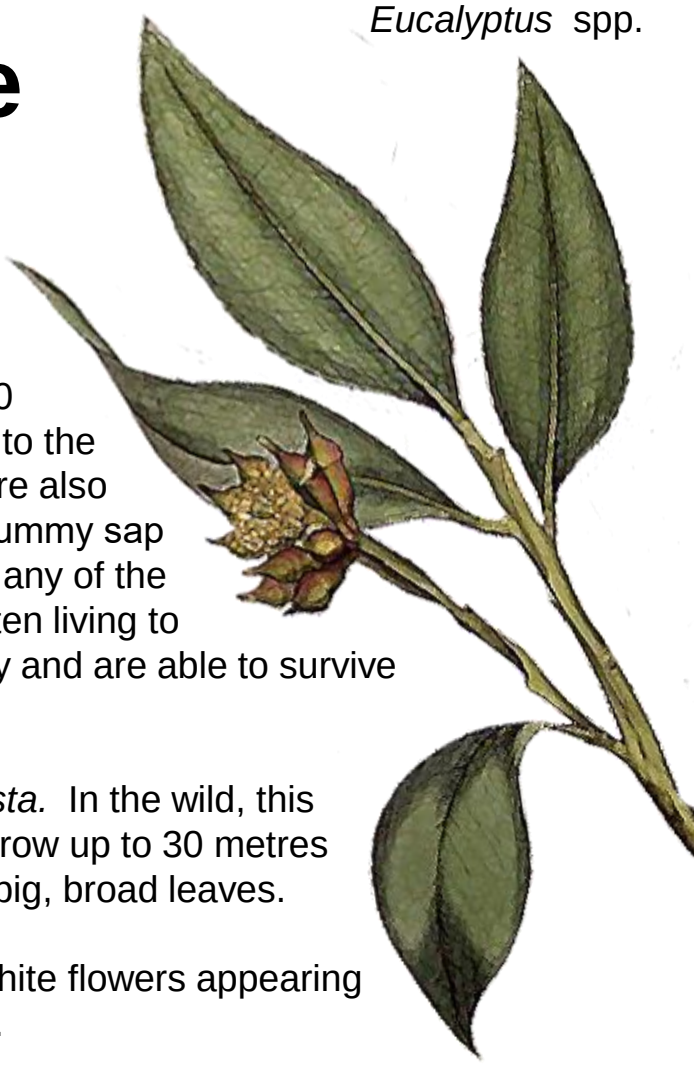
Monkey puzzle trees are classed as endangered in their native range, primarily due to logging. Logging was banned in 1990, but unfortunately, forest fires in the 2000's resulted in many of the surviving trees being lost. Over-harvesting of the seeds, invasive plants and over-grazing are all increasing threats to this tree

The monkey puzzle tree at Colchester Zoo is a young tree and is by the viewing area at Inca Trail opposite the penguins.

Eucalyptus spp.

Eucalyptus Tree

Habitat: Swamps and water logged soil
Native to: Australia



Eucalyptus trees are found through Australia and nearby areas. Despite only growing in a small portion of the planet, there are over 700 different species of eucalyptus, all belonging to the *Eucalyptus* genus. Some of these species are also referred to as 'gum trees' due to the sticky, gummy sap that leaks out when their bark is damaged. Many of the species of eucalyptus are very long living, often living to over 200 years. They are also very fire hardy and are able to survive and recover after bush fires.

At Colchester Zoo we have *Eucalyptus robusta.* In the wild, this species is found in eastern Australia. It can grow up to 30 metres tall and forms a very large canopy due to its big, broad leaves.

Eucalyptus trees are a flowering plant with white flowers appearing in summer and blooming throughout autumn.

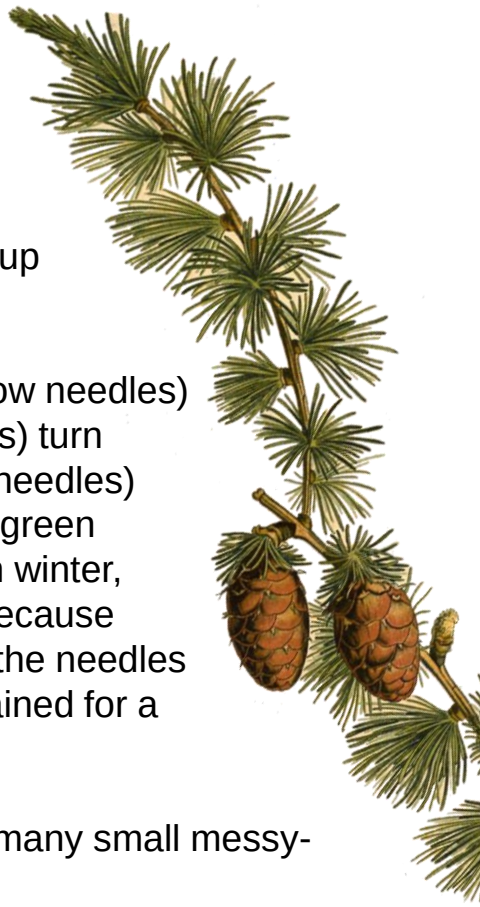
A food source for many animals, including flying fox who eat the flowers as well as koalas and a number of insects which eat the leaves. The nectar is eaten by lorikeets and, due to its flowering over the autumn, it is an important food source for animals.

A common tree outside Australia now, being found through out the U.K. as an ornamental plant. In Hawaii it is classed as an invasive species. Throughout the world, this tree is grown and harvested for timber. It is a hardwood, and primarily used for flooring and in construction.

Colchester Zoo has several eucalyptus trees. The easiest ones to find are located just to left of the exit to Worlds Apart.

Larix spp.

Larch Tree



Habitat: Lowlands in the north and mountain regions in the south of its range
Native to: Temperate zones in the Northern Hemisphere

Common throughout Europe and North America, growing up to 45 metres tall.

Larch are a type of conifer (meaning their leaves are narrow needles) however they are a deciduous tree. Their leaves (needles) turn brilliant yellow in the autumn and they loose their leaves (needles) by winter. During the winter they look dead, before bright green leaves (needles) start growing again in the spring. Even in winter, they are easy to distinguish from other deciduous trees, because their small oval cones remain on the branches even after the needles have been shed. These old cones can sometimes be retained for a number of years before finally dropping off.

Their leaves (needles) grow in characteristic clumps with many small messy-looking needles growing from one central clump.

Valued for timber as it is strong and waterproof. Its waterproof characteristics make it resistant to rot, so it is frequently used for fencing, gates, garden furniture, building cladding and in the construction of boats. It is relatively fast growing and resistant to many diseases, and this coupled with the demand for its timber means it is frequently cultivated on wood lots and in commercial forests.

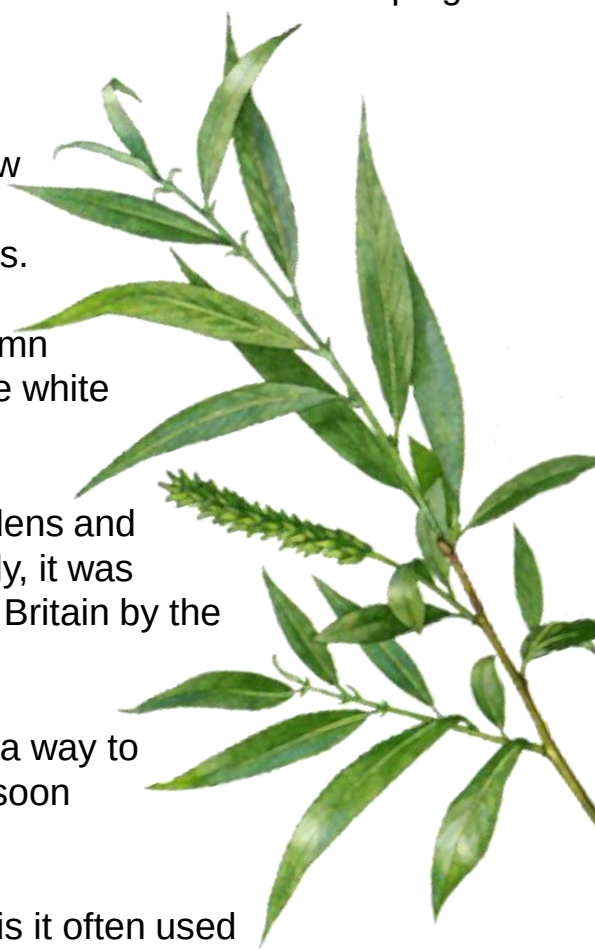
Colchester Zoo's larch trees can be found in-between the giraffe and elephant outside enclosures, on the side of the giraffe enclosure, half way up.

Salix spp.

Willow

Habitat: Dry to moist soil
Native to: Northern parts of temperate zones in the Northern Hemisphere

There are over 400 species of willow. At Colchester Zoo there are 2 species, goat's willow which is native to Europe and the weeping willow, which is native to Northern China. The most numerous and easiest to find at Colchester Zoo is the weeping willow (pictured left).



The weeping willow is a short lived tree by tree standards, only living to around 75 years. It can grow up to 25 metres tall and is easily recognised by its drooping branches and long downward facing leaves.

Willows are a deciduous tree, turning yellow in autumn and losing their leaves by winter. In spring they have white flowers.

Weeping willow is a popular ornamental tree in gardens and parks across Europe and North America. Historically, it was commonly traded along the silk road, and arrived in Britain by the 1700's.

Weeping willow was also introduced to Australia as a way to prevent soil erosion along rivers. However the tree soon established itself and is now classed as a pest.

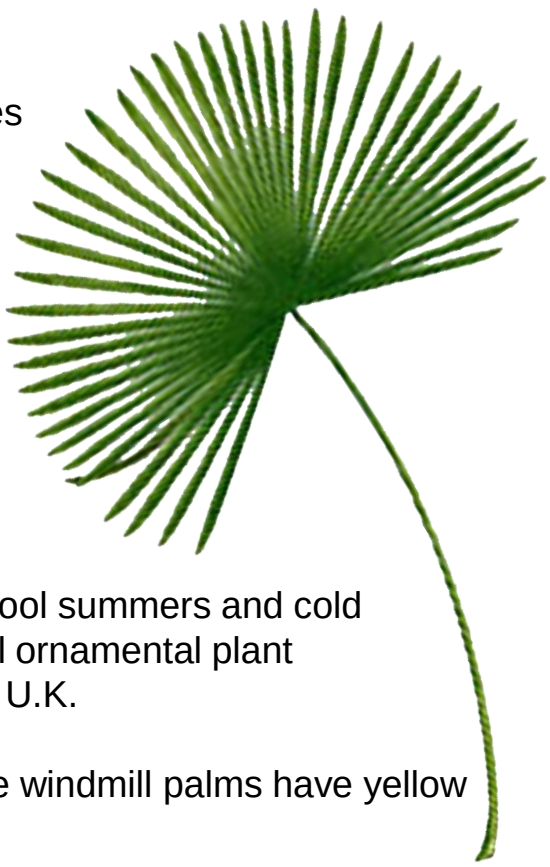
Willow has many uses. Due to its flexible branches is it often used to makes fences as it can be weaved through fence posts, this is called wattle fencing. This technique has also been used in constructing frames of buildings. Willow branches also be used to weave baskets. Historically these flexible branches were also woven into fishing nets, with some nets dating back to 8300BC.

All willows have mild pain relief properties and records of using willow as a pain medicine have been found in Ancient Egypt, Greece and by North American Indians.

The best place to view some of Colchester Zoo's many weeping willow trees is near the lake.

Trachycarpus Fortunei

Windmill Palm



Habitat: Mountains regions between 100-2400 metres above seas level
Native to: Japan, China through to Northern India

Palm trees (family Arecaceae) are classified beased on their leaves which are either palmately (fan-leaved) or pinnately (feather-leaved) compound. The Windmill palm is a fan-leaved palm. It is a relatively large palm tree and can grow up to 20 metres tall.

A very hardy plant, the windmill palm can cope with cool summers and cold winters. This cold tolerance has made it a successful ornamental plant throughout North America, France, Germany and the U.K.

This plant has separate male and female plants. Male windmill palms have yellow flowers and female plants have green flowers.

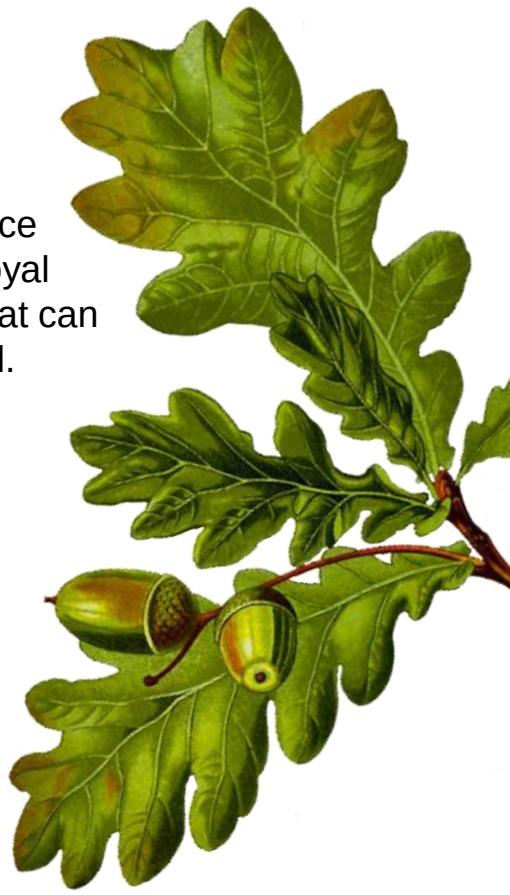
Windmill palms have been used in China and Japan for thousands of years. The trees were purposely cultivated for their strong leaves and fibres which were woven into sacks, rope, and even clothes.

The first windmill palm to reach the U.K. were smuggled from China in 1849. Robert Fortune smuggled the plant into the U.K. and brought it to Kew Gardens and the Royal garden of Prince Albert. His worked in document the species was later acknowledged, which the tree's scientific name, *Trachycarpus Fortunei,* was later named after him.

Colchester Zoos has serval windmill palms around the large lake by the Sausage Hut.

Quercus robur

English Oak



Habitat: Moist soils
Native to: Across Europe

The English Oak is the national tree of England, and since the English Civil War has sometimes been called the Royal Oak. It is a large deciduous tree with a circumference that can reach 12.2 metres wide and growing up to 40 metres tall.

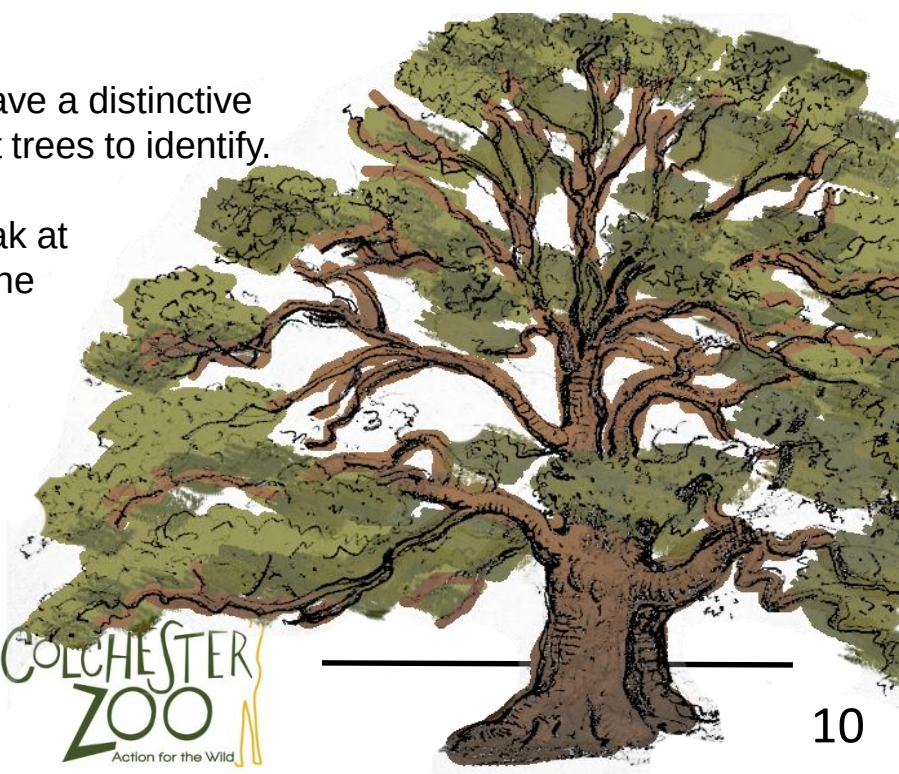
The English oak is the most common native tree in the U.K. and makes up lots of the native forests. Due to its open canopy, which allows light to reach the forest floor, other plants such as flowers and ferns can easily grow around the oak.

The long lived tree can grow in the wild for a few centuries. It grows quite quickly at the start and slows as it ages. They typically don't produce acorns until the age of 40, with the highest levels of acorn production between 80-120 years. While most English oaks only live a few centuries, when they are heavily managed through pollarding or coppicing they can live much longer, with some individuals living for over 1,500 years.
An important food source for many animals such as birds and mammals, as they eat the acorns and the oak is host to many species of invertebrates, which are also a food source for many birds and other invertebrates.

As with all deciduous trees, the English oak loses its leaves in autumn. These leaves rot very quickly thereby improving the soil quality to help the tree grow again in the spring.

The leaves of the English oak have a distinctive shape, making it one the easiest trees to identify.

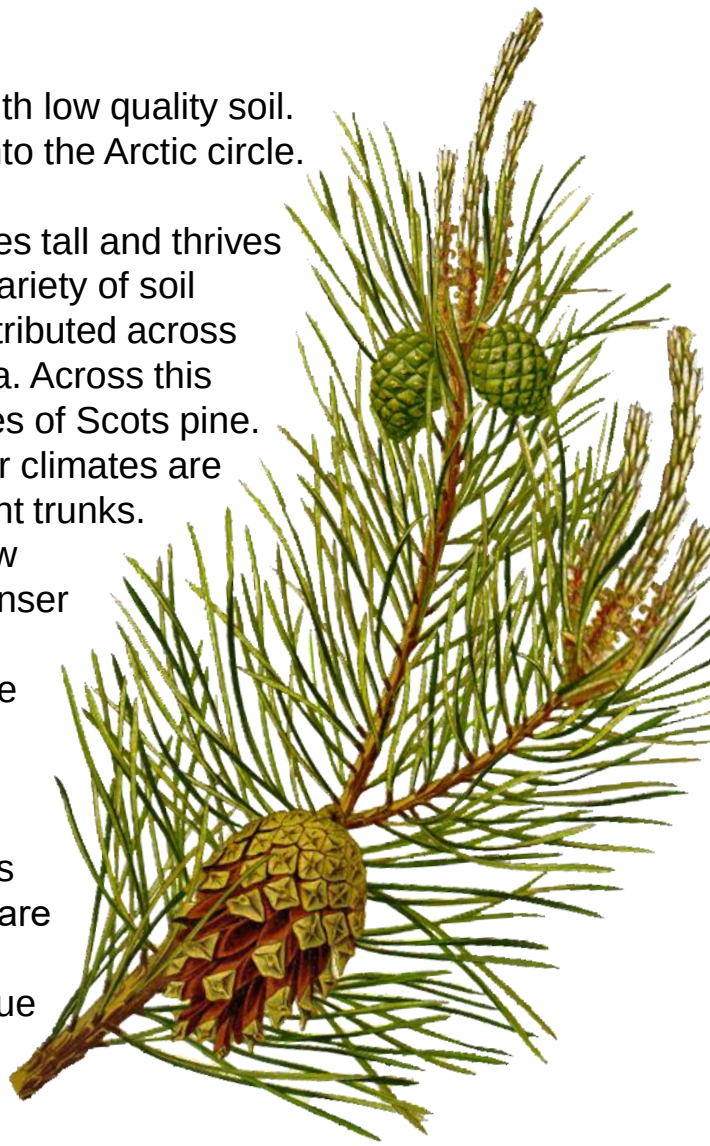
The best place to find English oak at Colchester Zoo is to the left of the wolf enclosure.



Pinus sylvestris

Scots Pine

Habitat: Heathland and mountain ranges with low quality soil.
Native to: Europe through Russia and up into the Arctic circle.



This evergreen tree can grow up to 35 metres tall and thrives in poor soil conditions. Its adaptability to a variety of soil conditions means that this tree is widely distributed across Europe and is found from Portugal to Russia. Across this wide range, there are many different varieties of Scots pine. Typically, the varieties which grow in warmer climates are faster growing and produce very long straight trunks. Varieties which grow in cooler locations grow very slowly, and as a consequence have denser wood; these trees are also quite short in comparison to warmer varieties. Some of the colder growing varieties can live for over 700 years!

The Scots pine is a conifer tree. This means that instead of broad flat leaves, its 'leaves' are fine waxy needles. These needles are cold resistant, and mean that the tree can continue growing even in winter with the air is cooler and there is less sunlight.

This conifer is one of only three conifer trees which is native to the U.K. (the other two being yewjuniper), and is the national tree of Scotland. Of the three native conifers, the Scots pine is the only one grown commercially for timber. It is one of the strongest softwood and is used in the construction industry. It is frequently used in telegraph poles, gate posts, fencing, flooring and making paper. Due to its commercial success, it is now found in many locations through the U.K., both in managed plantations and wild forests.

Scots pine can be identified from other pine species because its leaves (needles) are slightly twisted and grow in pairs.

The Scots pine can be found opposite the entrance to the Lost Madagascar Express. It's the tallest tree in the area.

Pre-Trip Classroom Ideas:

These are ideas to get teachers thinking about how to relate plants to other subjects. 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. Look at the structure of different plants.

3. Discuss what plants need to survive.

4. Research food chains. Have students create a food chain showing how various animals and plants are connected. Students will need to research animal diets.

5. Research national parks and other conservation areas, which were created to protect habitats and plants in order protect animals.

6. Start learning about the savannah by investigating a local grassland, like a field. Learn about different types of grass, and search for minibeasts.

7. Use a Venn diagram to compare and contrast a species of tree and a species of fern. Draw two overlapping circles and fill them in. The areas where the circles overlap contain attributes they both share. The portions that don't overlap contain unique attributes. These Venn diagrams could focus on plant structure, habitat requirements, method of pollination etc.

8. Cut pictures from magazines, or find pictures online, and make a class collage of different plants. The collage could focus on one type of plant or plants found within the same habitat, such as rainforest plants or desert plants.

9. Look at how plants can use animals to spread seeds and aid in pollination.

10. Look at how plants can defend themselves from being eating by animals.

Pre-Trip Classroom Ideas:

Vocabulary Words Part One:

Adaptation	A feature that helps the plant survive.
Browser	An animal that mainly eats leaves from trees and bushes.
Broadleaf	A tree with flat leaves which produced seeds in fruit (e.g. oak, apple, willow, cherry, maple, etc.) (as opposed to a conifer).
Camouflage	Patterns that help animal blends into their surroundings.
Carnivore	An animal that mainly eats meat.
Conifer	A plant which bears cones (e.g. pines, larches, spruce, etc.) (as opposed to a broadleaf). Most conifer plants also have leaves which are modified into needles or scales.
Deciduous	A plant that will lose its leaves seasonally and regrows them latter; most deciduous plants loose their leaves in autumn and regrow in the spring.
Desert	A habitat where it is very dry with almost no rain. Very few plants.
Endangered	Very few left, it faces major threats, and it might go extinct.
Evergreen	A plant that keeps its leaves throughout the year.
Extinct	Species that can no longer be found anywhere. They have died out.

Pre-Trip Classroom Ideas:

Vocabulary Words Part Two:

Flower	The reproductive part of the plant that allows the dispersal of pollen and in some cases the fertilisation of seeds. Also know as blossom.
Fruit	The seedbearing structure in flowering plants - this includes structures commonly referred to as fruit (e.g. apples, lemons, etc.) but in botany the term also includes bean pods, corn kernels, nuts, etc.
Grassland	An ecosystem where the main plant is grass.
Grazer	An animal that mainly eats grass and other plants on ground level.
Habitat	The type of place an animal lives (e.g. savannah, rainforest, etc.)
Herbivore	An animal that mainly eats plants.
Omnivore	An animal that eats plants and meat.
Pollen	Used by plants to fertilise other plants of the same species, in order to produce seeds. This is called pollination.
Rainforest	A forest habitat with lots of plants, lots of animals and lots of rain (also called a jungle).
Savannah	A tropical grassland habitat, with lots of grass, and few, sparse trees.
Tree	A plant that grows a trunk of wood, which then grows branches to support leaves.

Pre-Trip Classroom Activities:

Food, Water, Shelter, Space

This activity helps pupils visualise the importance of good habitat

Time: 10-20 minutes
Ages: Year 2 and up
Subjects: Physical Education, Maths
Materials Required: Cups and pom-poms

Prior to this activity teach the pupils the essential components of any habitat: food, water, shelter and space. Review these components and create actions for them, e.g. food = rub belly, water = cupped hands to lips, shelter = hold hands over head, space = hold hands open wide.

Mark two parallel lines on the floor on either side of a room. Ask two volunteers to be zebra and have them stand behind one of the lines. The rest of the class is the habitat, have them stand behind the line on the other side.

Explain that the zebra need to find food, water, shelter and space in their habitat in order to survive. Have both groups turn around with their backs to each other. Everyone including the zebra needs to choose a habitat component and make an action for them. Remind them that they are not allowed to change their action. At the teacher's signal, both groups turn continuing to show their component action. Habitat stays where they are, and the zebras run across the room and find the habitat component that matches them. The zebras bring their matching habitat component back to their line, where they now become zebras, representing successful years resulting in more zebra offspring. Any zebra that don't find their match die, rot, and become part of the habitat, and go stand behind the habitat. Repeat.

After each round have the pupils count how many zebra are alive. Place pom-poms in the cups to represent this (two zebra, two pom-poms), with a new cup for each round. Each round represents a year. Continue the game for at least five years. Some years there will be lots of zebras, some years not as many.

At the end of the game, discuss what happened. Show the pom-poms and make a graph of them indicating the changing zebra population. Have older pupils construct graphs based on this data. Explain that the results show that when the habitat meets all their needs there can be many animals, and when the habitat has problems (e.g. drought with no water) the animal populations decline.

Pre-Trip Classroom Activities:

Hide and Seek

This activity can help show how animals' colours and patterns can be used for camouflage or mimicking plants.

Time: 1+ hours
Ages: Year 1 and up
Subjects: Science, Art
Materials Required: arts and craft materials, pictures of animals, plants and habitats

In class look at how animals use the colour and cover of plants to stay out of sight of predators and how predators use it to hide from prey. Also look at how animals mimic plants or parts of the plant to stay hidden.

Potential animals to look at are:

- Sloth (they allow plants to grow in the fur)
- African lions
- Jaguar
- Preying mantis
- Dead leaf butterfly
- Frogmouth (a type of bird)
- Dead leaf frog

After this, give the pupils a mixture of different plants and habitats along with pictures of animals that use camouflage or mimicry. In groups they have to choose which plant or habitat would be best for the animal to stay hidden.

As an addition to this, create pieces of wall art, which is made up of plants and hide pictures of animals. If in the classroom have the children create the art and then the teacher can hide animals, adding a new animal each week for the children to find. If out in a corridor, other classes can try and find the animals.

Pre-Trip Classroom Activities:

Climate Zone Map

This activity is to highlight that the planet has different climate zones and that plants need certain adaptations to survive in these zones.

Time: 10-20 minutes
Ages: Year 3-5
Subjects: Science, Geography
Materials Required: Map on next page

Explain that the planet has different climatic zones and go over the key aspects of the different zones.

Use some plants that are found in each zone to look at adaptations the plant has to survive in that zone. I.e.:

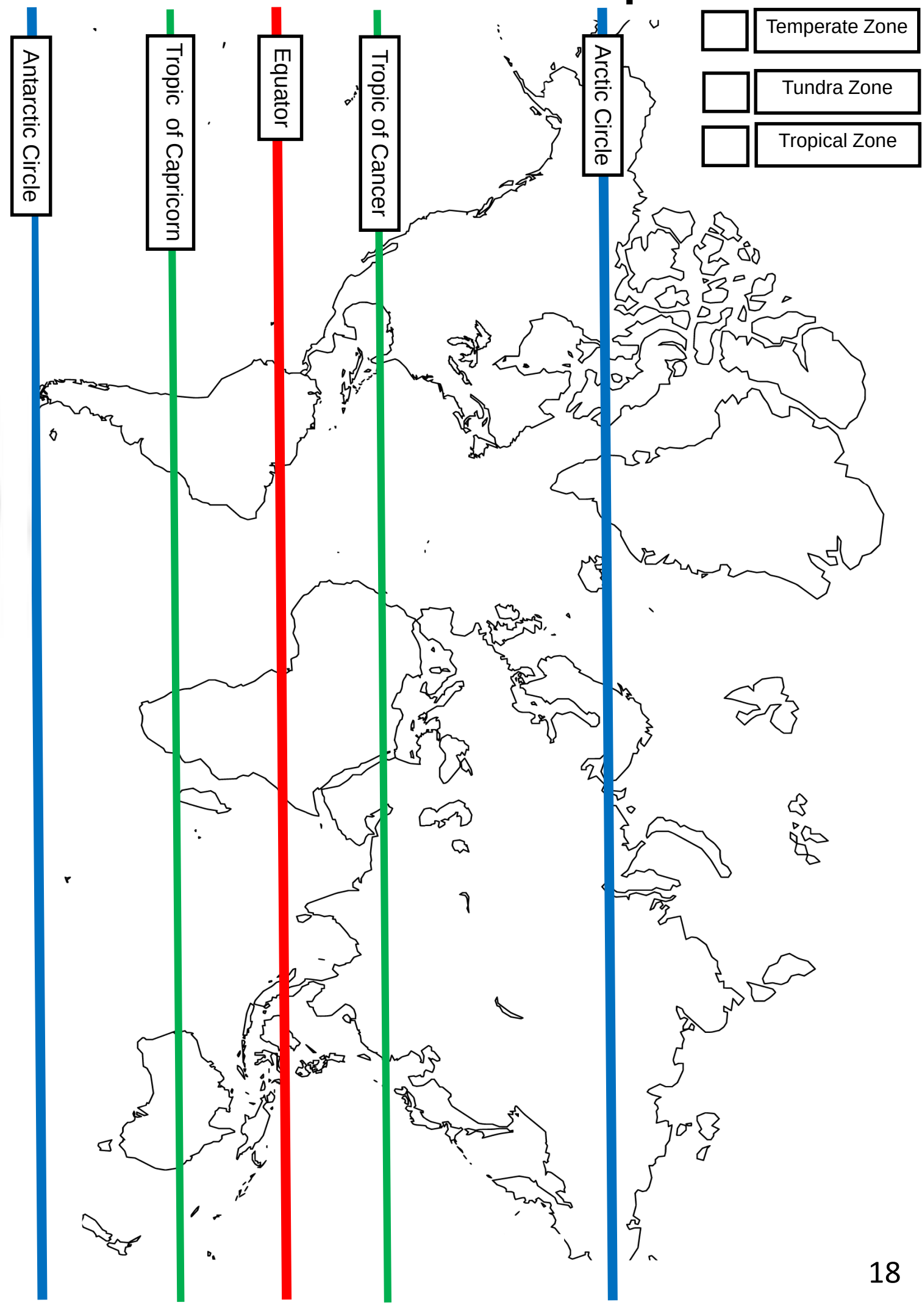
- Oak for temperate zone
- Scots pine in the tundra
- Mango tree in the tropical zone

Hand out copies of the map to each pupil and make sure they each have three different coloured crayons. Instruct the pupils to colour their map based on the key (only the land). After all pupils finish colouring, go through the points again and have them label their map key with the names of the zones.

For older pupils look at more detailed climate zones such as sub-tropical, sub-artic zone along side the other zones.

The map on the next page has the Arctic and Antarctic Circles, the tropics of Cancer and Capricorn and the equator stated to make it easier to find the zones.

Climate Zone Map



Pre-Trip Classroom Activities:

The Count

This activity is to highlight habitat loss in the U.K. as well as engaging the students with the natural habitat around them.

Time: 20-30 minutes
Ages: Year 4-6
Subjects: Science, Maths, Citizenship
Materials Required: ID sheets, recording sheets

Habitat loss is often associated with rainforests far from the U.K. however, habitat loss happens much closer to home. Since World War II, 97% of U.K. wild flower meadows and over 200,000 miles of hedgerows have been lost. Half of the ancient woodlands have also gone, along with 75% of heaths. Due to the demand for peat for gardens 98% of lowland raised bogs have also disappeared (the further reaching effects of peat bog harvesting can be looked at in the Stop The Flood activity in the post-trip activities) This has resulted in many plants and animals disappearing.

Over the last 100 years, 22 species of wildflower, including the once common Corn Cockle are extinct with over 300 other species on the brink of extinction.

Have the students head out into the school grounds to identify and count the number of flowers, trees and bushes.
Below are two websites that can be used to create plant I.D. charts:
http://www.woodlandtrust.org.uk/visiting-woods/trees-woods-and-wildlife/british-trees/native-trees
http://www.nwc.org.uk/visitor_centre/plant_id_guide

This can also be a take away activity to do in their own gardens at home or nearby green spaces under adult supervision.

After the count, have the students create graphs to display their data. Have the students analyse and answer questions based on their data, such as:
Did someone find a rare plant?
Are there lots of the same plant?
Which are the most common plants?
If no one found a certain plant, investigate why. Maybe it doesn't grown in your region or is it too rare?

Pre-Trip Classroom Activities:

Plant Poetry

Pupils use their knowledge of plants to write poetry.

Time: 15-30 minutes
Ages: Year 3-6
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 a plant. Using their memory and imagination they can try and write poetry about the importance of plants and/or what they mean to them and the rest of nature.

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

Tree big and sturdy (five syllables)
Flowers show off bright petals, (seven syllables)
Grasses green and lush (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:

Tree (one word—a plant)
Tall, strong (two words that describe it)
Gives clean air (three words expressing action)
A constant over time. (four words explain how you feel about it)
Precious (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 a plant (for older children try hiding messages).
For example:

Fields of flowers
Light showing off beautiful petals
Often picked to show off in our homes
Wished not all were picked
Extinct some are
Ruined the home of nature we have

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 interacting with plants. Are they hiding in them? Or climbing on them? etc

3. Have students make a detailed sketch of a plant around the Zoo

4. Take photos of the plants, and animals using plants. When you get back to school make a photo scrapbook of your trip.

5. Attend the elephant and giraffe feeds and have your students take notes. The keepers will tell you about the animals and the threats they may face in the wild.

6. Look at how plants are used in the Zoo. Plants can be used for food and cover etc.

7. Make a tally chart of native and non-native plants around the Zoo.

8. Have the students find an endangered animal at the Zoo to understand the reasons why it is endangered. Use this knowledge back at school to look at why plants are endangered.

9. Habitat loss is a major cause for animals becoming endangered. Look at information at the Zoo to see how animals rely on the habitat to survive.

At the Zoo Ideas: Plant Scavenger Hunt

Ages: years 1 - 6
Subjects: Art, Science

On the map are 4 stars that show 4 unique plants that can be found around the Zoo. When you find them draw them or a part of them. Once back at school research the plants and find out some facts about them.

Larch Tree 4

Eucalyptus Tree 7

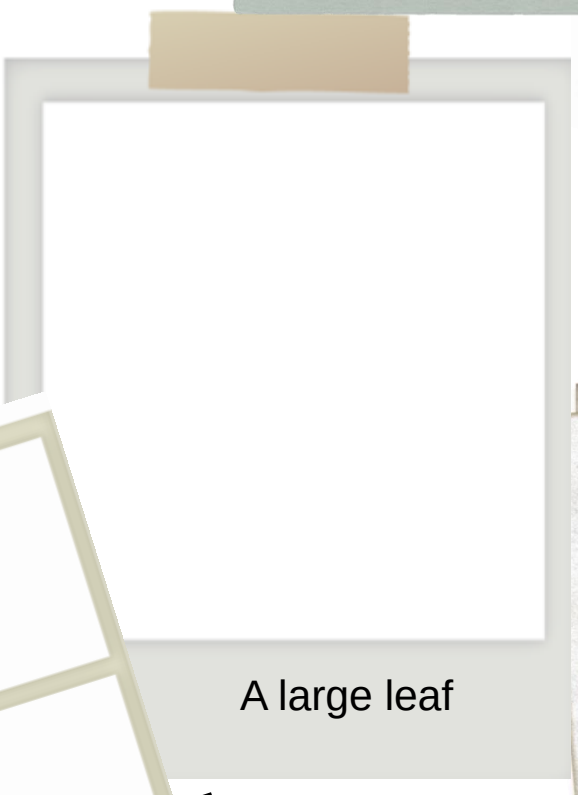
Monkey Puzzle Tree 6

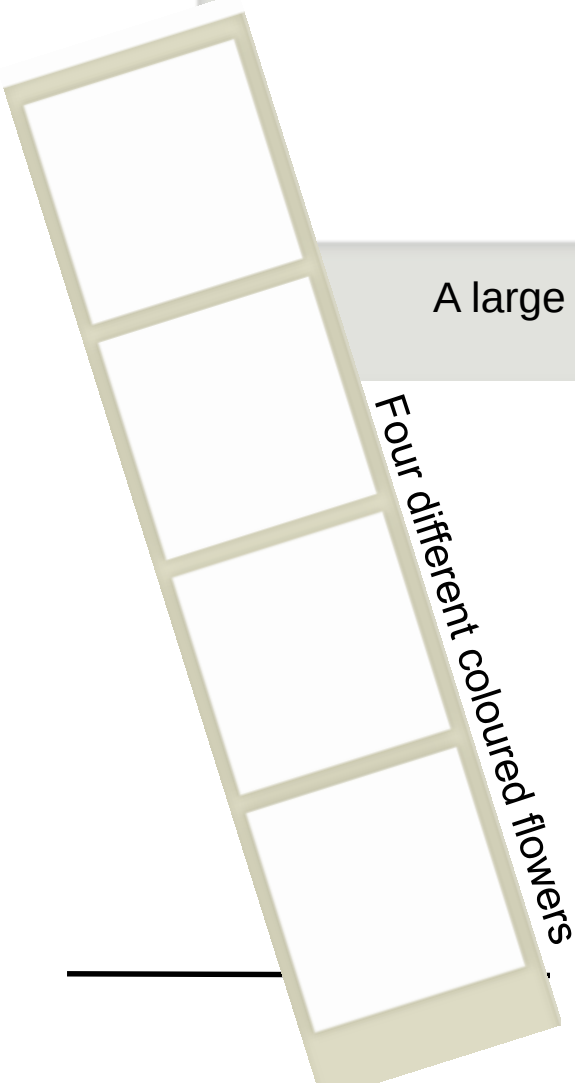
Tree Fern 8

At the Zoo Ideas: Senses Scavenger Hunt

Ages: years 1 - 4 (ages 5-8)
Subjects: Art, Science

Draw pictures of the animals or things when you find them:





At the Zoo Ideas: Plant Scavenger Hunt

Ages: years 1 - 6
Subjects: Art, Science

Draw pictures of:

A flowering plant

A non-flowering plant

An evergreen tree

A deciduous tree

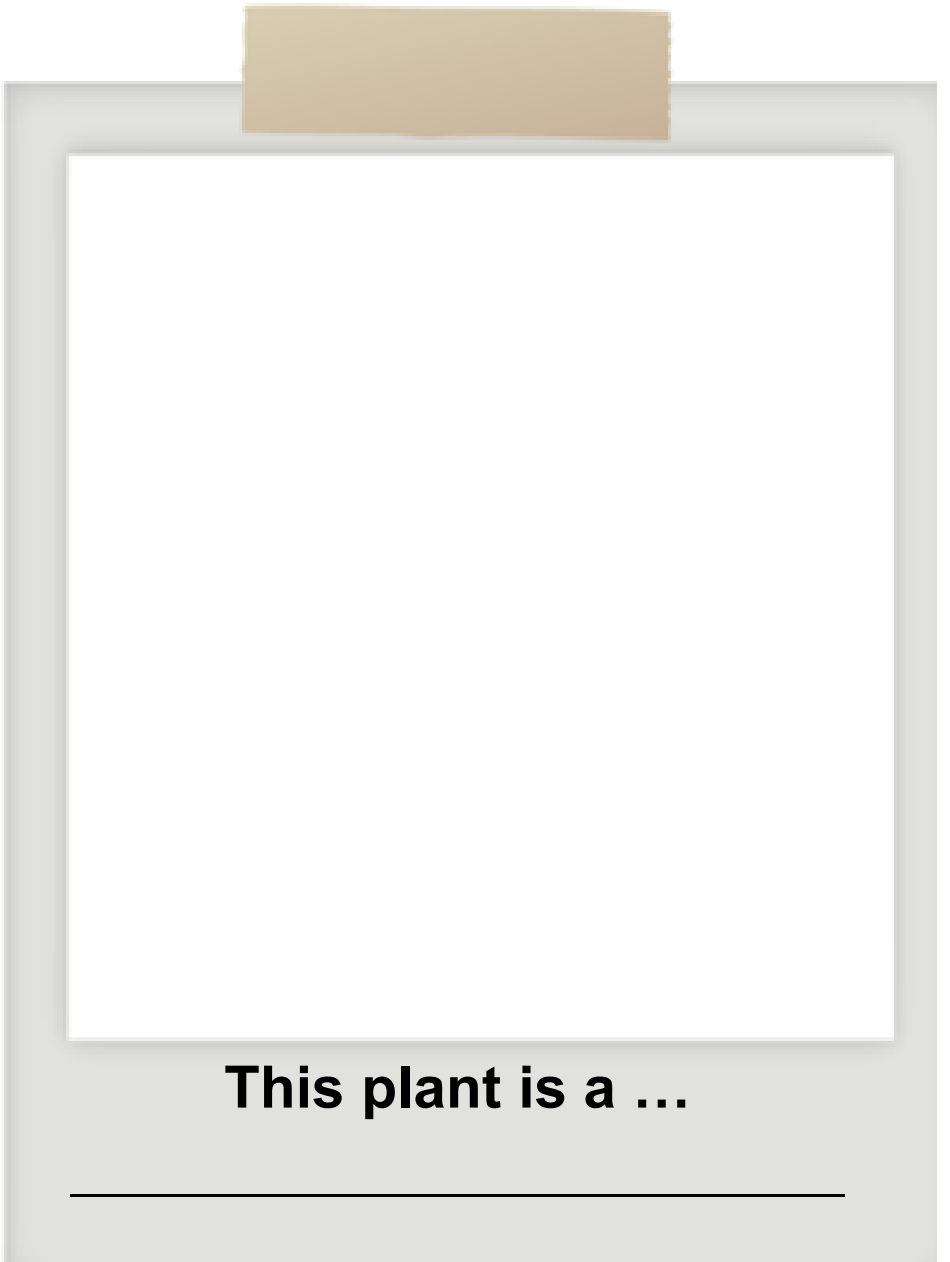
A tall plant

At the Zoo Ideas: Plant Description

Ages: years 4-6
Subjects: Science

Does it have leaves?_____

Does it have petals?_____



This plant is a …

_____

How big/tall is it?

_____

Are there lots of the same plant?

_____
_____
_____

Does it have any defences to stop animals eating it?

_____
_____
_____

Can animals eat the plant or parts of the plant?
If yes, what parts?

_____

At the Zoo: Camouflage Creepy Crawly

Visit the Discovery Centre and watch the stick insects.

Draw a picture of two different types of stick insects.

Why do you think they look different?_____

_____

_____

Stick insects have camouflage that helps them hide in trees. Which part of the tree do you think each type of stick insects would be the best at hiding in? Draw this in the background of your pictures.

Hold the Giant Spiny Stick insect.

What does it feel like?_____

_____

_____

_____

Why do you think it feels like that?

_____

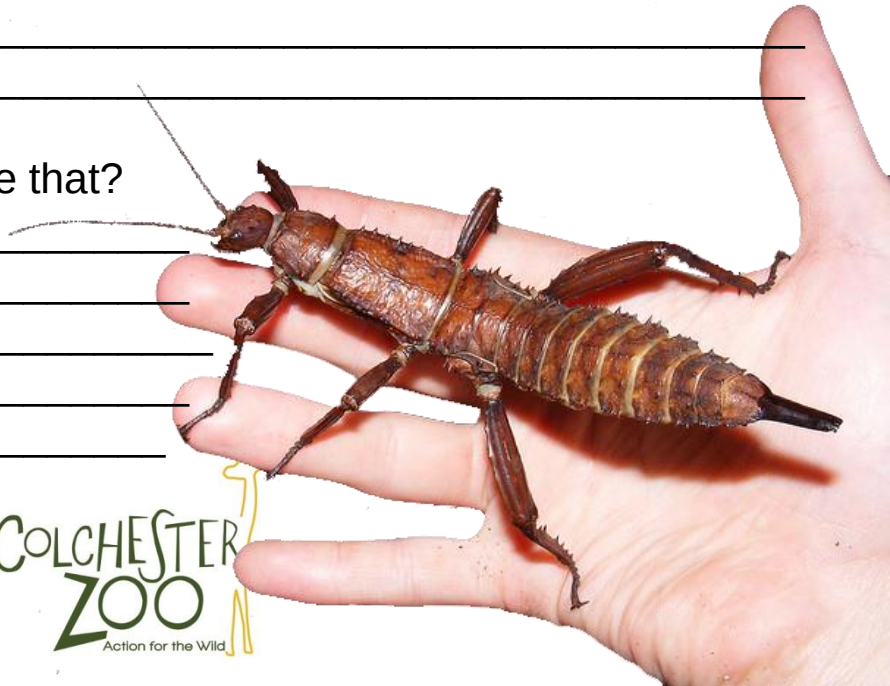
_____

_____

_____

_____

_____

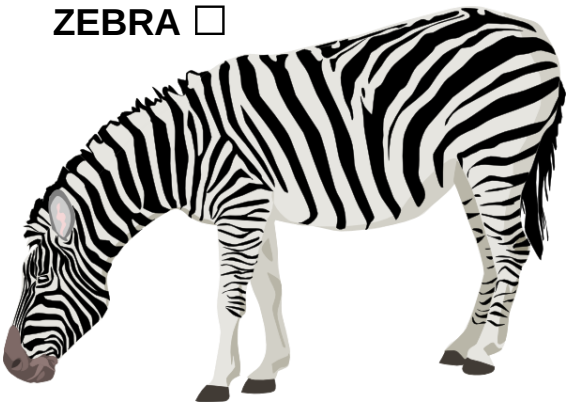


At the Zoo: Herbivore Guide - Beginner

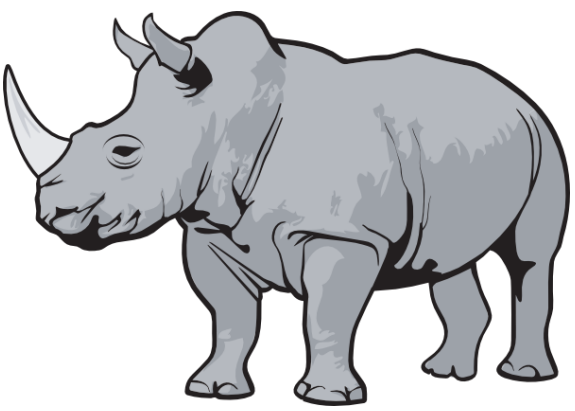
On your trip to Colchester Zoo, be on the lookout for animals that are herbivores. Keep track of the ones you find by ticking them off as you go.

WALLABY ☐

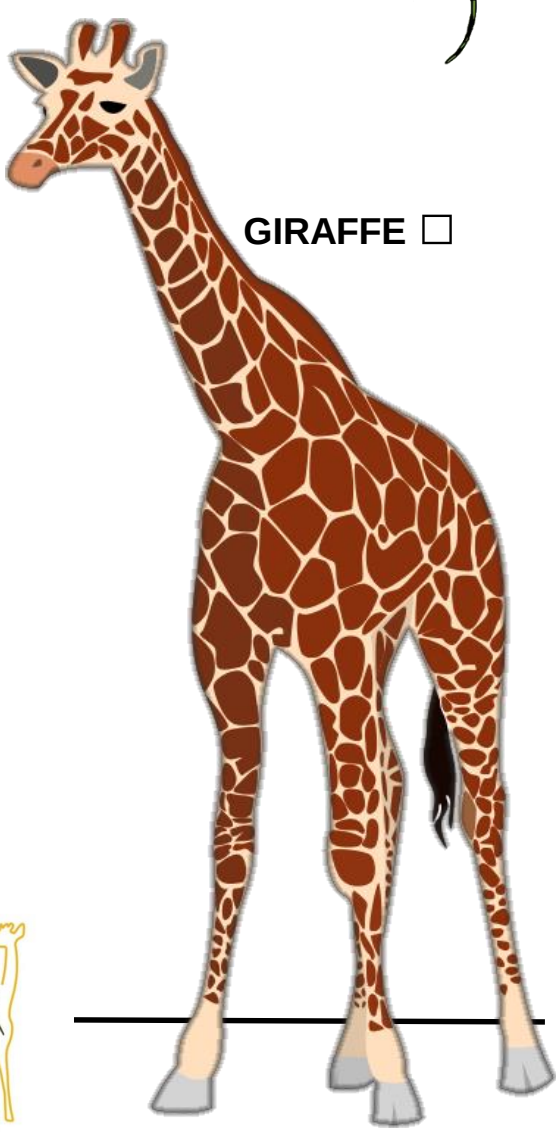
ZEBRA ☐



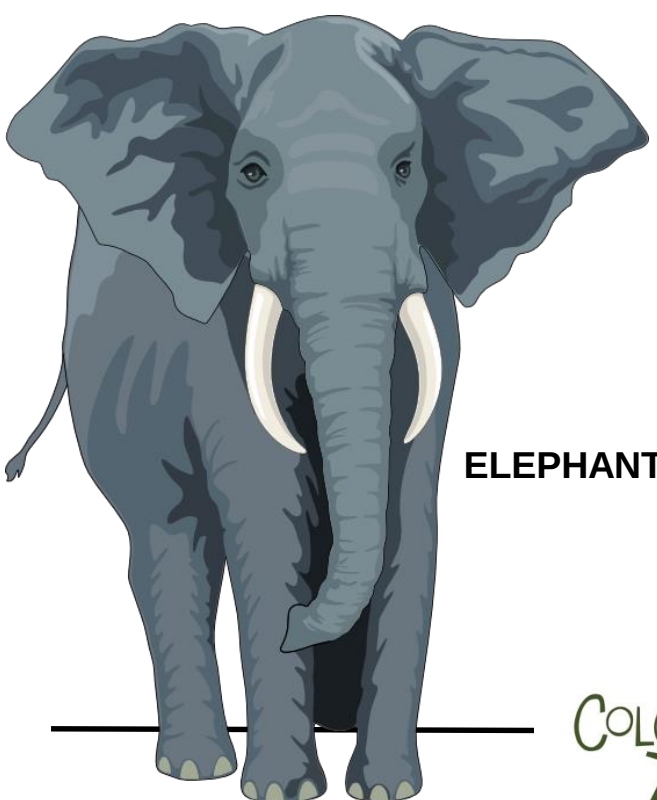
RHINOCEROS ☐



GREEN IGUANA ☐



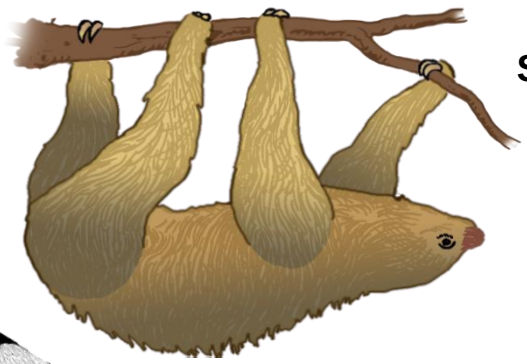
GIRAFFE ☐



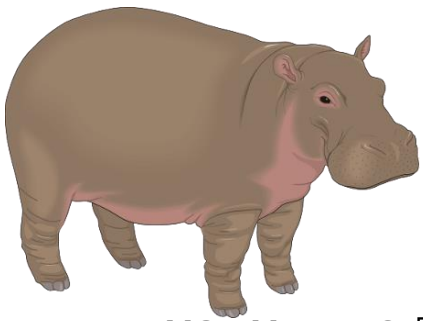
ELEPHANT ☐

At the Zoo: Herbivore Guide - Medium

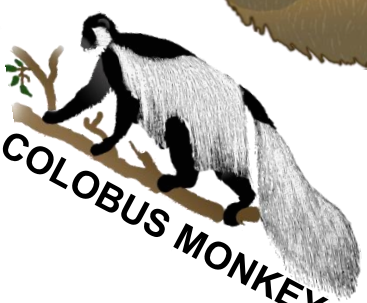
On your trip to Colchester Zoo, be on the lookout for animals that are herbivores. Keep track of the ones you find by ticking them off as you go.



SLOTH ☐

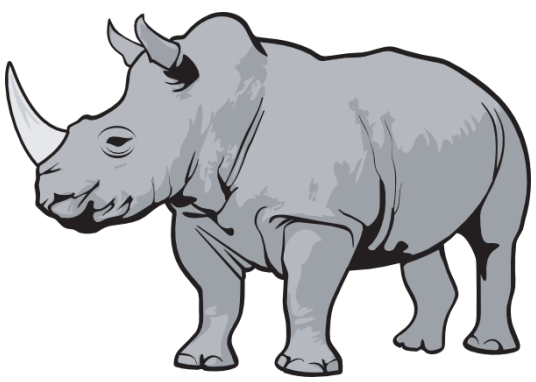


PYGMY HIPPO ☐

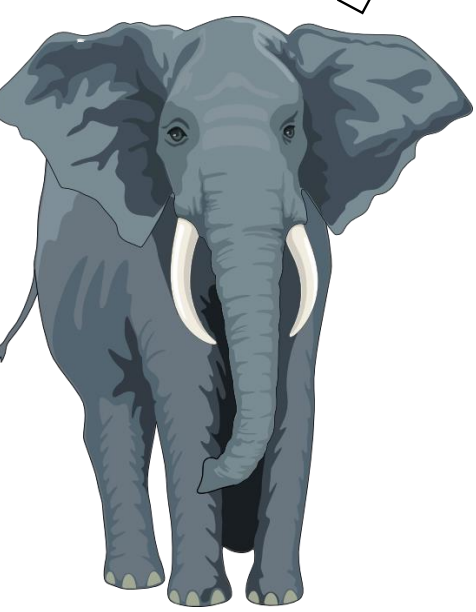


COLOBUS MONKEY ☐

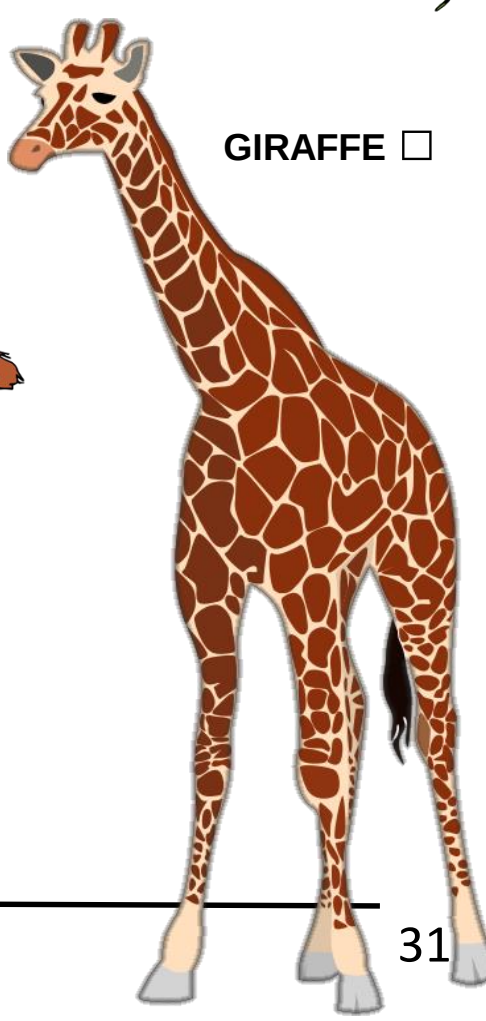
RHINOCEROS ☐



GREEN IGUANA ☐



GIRAFFE ☐



RED PANDA ☐

ELEPHANT ☐

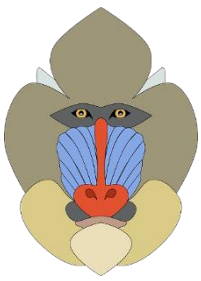
ZEBRA☐

At the Zoo: Herbivore and Omnivore Guide - Advanced

On your trip to Colchester Zoo, be on the lookout for animals that are herbivores and omnivores. Keep track of the ones you find by ticking them off as you go.

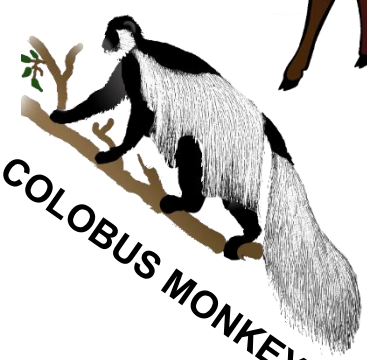
VISAYAN SPOTTED DEER ☐

MANDRILL ☐



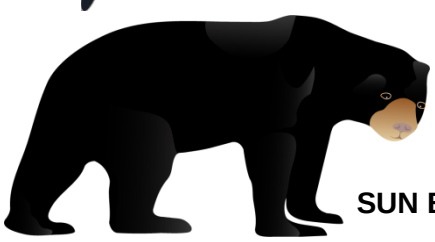
BINTURONG ☐

LEMUR ☐

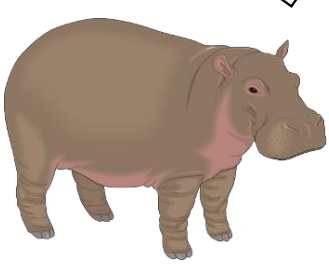


COLOBUS MONKEY ☐

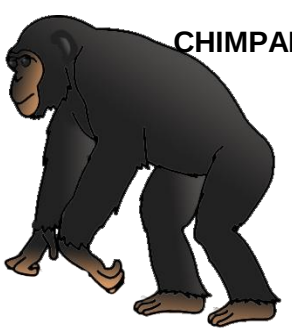
WARTHOG ☐



SUN BEAR ☐

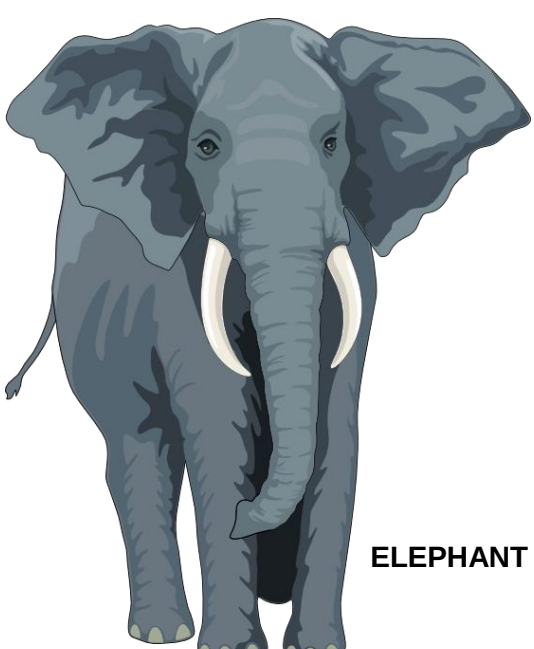


CHIMPANZEE ☐

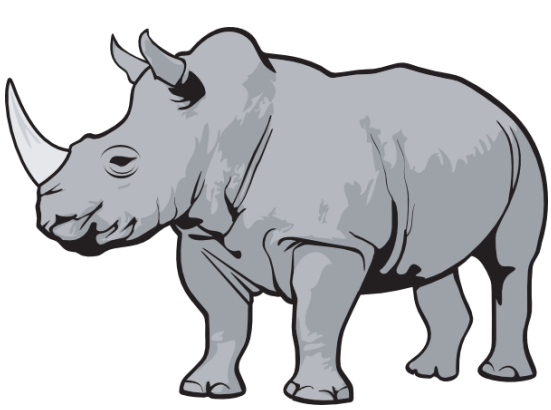


GIRAFFE ☐

PYGMY HIPPO ☐



ZEBRA ☐



ELEPHANT ☐

RHINOCEROS ☐

COLCHESTER ZOO
Action for the Wild

At the Zoo: Plant Hunt

Ages: years 1 and up
Subjects: Science, Literacy

Go to the garden opposite Walking with Giants (tortoise enclosure) in the Familiar Friends area of the Zoo. Use the clues below to identify the plants by reading the plant information signs in the garden.

1.This plant has white flowers and red fruits with smooth grey bark that gets rough with age.

_____

2. An evergreen shrub used in cooking. If left, the flowers are purple/blue spikes.

_____

3. Even though this plant is called bamboo, it's not bamboo. It has white flowers and the berries are toxic to cats and grazing animals.

_____

4.Dispute the name, this plant is not native to England. Instead it's native to the Mediterranean.

_____

.This plant can grow up to 8 metres tall with honey scented, white flowers. The fruits are not true strawberries, but are orange-red fruits.

_____

Note for teachers: Answers are on the next page.

At the Zoo: Plant Hunt Teachers Answer Sheet

The answers to the clues from the plant hunt activity are in red.

1. This plant has white flowers and red fruits with smooth grey bark that gets rough with age. **Mountain Ash**

2. An evergreen shrub used in cooking. If left, the flowers are purple/blue spikes. **Common Sage**

3. Even though this plant is called bamboo, it's not bamboo. It has white flowers and the berries are toxic to cats and grazing animals. **Heavenly Bamboo**

4. Dispute the name, this plant is not native to England. Instead it's native to the Mediterranean. **English Lavender**

5. This plant can grow up to 8 metres tall with honey scented, white flowers. The fruits are not true strawberries, but are orange-red fruits. **Strawberry Tree**

Post-Trip Classroom Ideas:

These are ideas to give teachers ideas on 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. During the trip have students choose a specific animal that is used by plants to aid in seed dispersal and gather information about it. After the trip have them conduct more in-depth research based on what they observed.

2. Choose two different habitats and compare the plants that grow there. Discuss what adaptations the plants have in order to survive. For example, compare rainforest plants and desert plants.

3. Research the mythology that surrounds some plants in different human cultures.

4. Construct a diorama of a habitat. Encourage students to include the natural features they would find in the habitat as well as three or four animals. They should be able to explain how the animals and plants are connected.

5. Research how plants can benefit humans health.

6. Create a ‘zoo guide book’ of your school trip to Colchester Zoo. Have students write article about the animals and plants they saw, and include pictures/sketches they made during the trip.

7. Plants can become endangered too. Research some plants that are endangered and how they can be saved, as well as what the pupils can do to help.

8. Search around the school and see what plants are around. Then compare the plants at the Zoo. Are many the same? If not, why not?

9. Design posters to show why plants are important to the health of the planet.

10. Bees and butterflies, need plants to survive. Look at which plants are bee and butterfly friendly and look at what makes these plants friendly for the bees and butterflies.

Post-trip Activity: Savannah Colouring

Ages: years 1-3
Subjects: Science, Art

Draw how the savannah would look like in the wet season and then on another copy, in the dry season

Post-Trip Classroom Activities:

Create a Plant

Pupils will use their knowledge about plant structure and adaptations to create a plant.

Time: 30+ minutes
Ages: Year 1 –6
Subjects: Science, Art
Materials Required: Craft supplies, glue, coloured paper.

Explain to the pupil that they will be building an imaginary plant that is adapted to a climate of the teacher's choosing, i.e. warm and humid, dry and hot or has the four seasons. Encourage them to be creative and add anything else they can think of from other materials.

Remind them to think about:

- How does it compete with other plants?
- How does it survive if there is a dry season or when there can be drought, and in wet season when areas can flood?
- How does it protect itself from being eaten?
- How does it spread any seeds?

After the pupils have finished construction, have each pupil name and describe their plant. Pupils can share and talk about their plant with the rest of the class.

Post-Trip Classroom Activities:

Food Webs

This reinforces concepts about interdependency of animals in habitats

Time: 10 minutes
Ages: Year 1 and up
Subjects: Science
Materials Required: Yarn, pictures of different plants and animals.

Have the pupils form a circle. Get them all to name plants and animals that live in a particular habitat. Below is how the activity works for the savannah habitat in Africa.

Hand out pictures of different plants and animals, or have the pupils remember their answers. Give the ball of yarn to one of the plants, e.g. an acacia tree. Then ask if any of the animals would eat an acacia tree. Find an animal, e.g. a giraffe, and hand the ball of yarn to the giraffe (the acacia tree should keep holding the end). Now ask what would eat a giraffe, a predator, e.g. a lion. Hand the ball of yarn to the lion.

Continue connecting the pupils with the yarn representing the relationship between the plants and animals. Consider other connections as well, e.g. this bird lays eggs, what would eat the eggs? This animal poops, what might use the poop? etc. Continue until all the pupils are connected together by the yarn. It should now look like a messy, interconnected web.

Investigate what happens to food webs if one element is removed. For example, ask what would happen if the savannah is turned into farm land, the acacia tree would be cut down. Have the pupil who is the acacia tree let go of the yarn. Now, any other pupil who's yarn is loose (they were connected to the tree) should also let go. Use this to reinforce discussions of threats African animals face, and how important all the parts are for a healthy ecosystem.

Post-Trip Classroom Activities:

Stop The Flood!

This is to show how habitat loss can cause a natural event such as flooding to become a natural disaster, which affects humans and nature.

Time: 30-45 minutes
Ages: Years 4-6
Subjects: Science and Geography
Materials Required: Tray, jug of water, art and craft items to represent houses etc. and a material that absorbs water quickly and easy. i.e. Sodium Polyacrylate, which is found in nappies (available to buy separately online, or rip open clean nappies to get it).

This activity can be done on a large scale demonstration for the whole class to see or have the pupils divide into groups, with each group having their own materials.
Within the tray create a small town using art and craft materials. Have one end of the tray be the town, which is slight raised, and the other end be a lake or part of a river with a small amount of water in.

Between the water and the town place the absorbent material. This material represent a peat bog or woodland etc. Once everything is in place pour the water into the lake. When the water reaches the material the excess water is soaked up and thus keeping the town safe. This shows how natural habitats such as peat bogs, woodlands, as well as marshes help control flooding.

Now repeat but this time take away the absorbent material. This time as you add the water, the water reaches the town and floods it. This happens throughout the world when the natural barriers are lost.

This shows why peat farming in the U.K. can lead to extreme flooding. Removal of other types of wetlands can have similar impacts on flooding. For example, it was partially due to removal of coastal wetlands that hurricane Katrina had such devastating impacts in the U.S.A. in 2005. Removal of trees on land can also contribute to flooding since their roots draw up water and naturally prevent the build up of water on land.

As an extension, pupils can look at some of the major flooding that has happened over the years in the U.K. and across the world and see if there is a link to habitat loss.

Post-Trip Classroom Activities:

Rainforest Products

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

Time: 20-30 minutes
Ages: Year 4 and up
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 the 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 where 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 derives 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, African 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 sulphate)	Asia (Indonesia, Philippines, India)
Liquid hand wash (sodium laurel sulphate)	Indonesia, Philippines, India
Moisturiser and hand cream (nut oils; coconut oils)	Indonesia, Namibia
Cosmetics: lipstick, foundation and mascara (cacao seed; palm oil)	Côte d'Ivoire , Ghana, Brazil, Ecuador, Indonesia, Malaysia
Vegetable oil	Indonesia, Malaysia
Rubber: car tyres, toys, shower mats, electrical wires, balls, etc.	Thailand, Indonesia, Malaysia
Banana	India, China, Philippines, Indonesia, Ecuador, Brazil, Uganda
Mango	Mexico, Brazil, Peru, Guatemala, Haiti
Pineapple	Costa Rica, Philippines
Limes and Lemons	India, Mexico, Argentina, Brazil,
Chewing gum (chicle tree sap/gum base)	Guatemala, Mexico
Rice	Thailand, Vietnam, Cambodia
Wooden furniture (teak, bamboo)	Indonesia and Myanmar
Paper (made from rainforest wood)	Indonesia and Myanmar
Coffee	Brazil, Colombia, Ethiopia, Côte d'Ivoire
Tea	Sri Lanka, China, India
Sugar	Brazil, India, China, Thailand

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 then 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?

UmPhafa Private Nature Reserve

UmPhafa is a nature reserve in South Africa, owned and managed by Colchester Zoo. We work there to protect and conserve African wildlife in Africa. The reserve is located in KwaZulu Natal and is 6,000 hectares.

It's a private reserve, which means people can't go there on holidays, or pay money to see the animals. It's not a tourist attraction, it's a real wild place to protect animals and learn more about them. Rangers work there to protect the animals, and interns can volunteer to help them out.

Go to the reserves' website: www.umphafa.com to find out more information about UmPhafa including wildlife research projects, facts about the animals, and a photo gallery.

Check out the next page for lesson ideas which will allow your students to learn about this amazing place!

UMPHAFA

COLCHESTER ZOO
Action for the Wild

UmPhafa Reserve Activities

If you're learning about Africa, or ecosystems in general, consider these ideas to help relate your learning to our nature reserve:

(Make sure to check out the website for facts, info, and pictures www.umphafa.com)

1. The name 'UmPhafa' is the Zulu name for the 'Buffalo Thorn Tree'. In the Afrikaans language the tree is called the 'Wag-'n-Bietjie Tree'. Have students research the meaning behind these different names and find out why the UmPhafa tree is so important in South Africa.

2. UmPhafa trees are very different t0 trees which grow in the UK. Learn how to identify local, native trees. Go out to a park and practice identifying the trees after learning about them. Which trees are most like the UmPhafa tree? Why do students think those plants have similar adaptations?

3. Staff from UmPhafa work closely with local schools to help children understand the importance of protecting native wildlife. Using the internet, research what a day as a child in a small rural village in South Africa might be like. Have your students discuss how this is different compared to a normal school day for them. As a follow up activity, research what life is like for a child in one of South Africa's major cities. How is this different than a rural village? How it is different from where you live?

4. UmPhafa protects a large area of habitat - it is 6,000 hectares. Research and use maths skills to find comparable protected nature reserves in the UK.

5. Read the details about all the species released onto the reserve: www.umphafa.com/about/umphafa-species (click the link on the page for a PDF list with photos). Most of these species are herbivores. Discuss as a class why the reserve has so many more herbivores than predators. An eventual aim of the reserve is to establish a cheetah population. What does the class think must be done before cheetahs can be released? Also check the news page on the Umphafa website as well.

We hope you enjoyed your trip to

COLCHESTER ZOO
Action for the Wild

Learning about Plants