

ADELAIDE
ZOO



Habitats



P
R
I
M
A
R
Y

Acknowledgements

This resource was developed by:
John Gardner, Zoos SA Education

With support from the following people and organisations:
Ruth Hall, Outreach Education, DECS, (seconded to Zoos SA)

Front cover layout designed by:
Christy Martin, Access Media, Open Access College

Front cover image designed by:
Mandy Foot, Characters Pty. Ltd.

This publication is protected by copyright. It may be reproduced by South Australian teachers for use with their students. For all other uses contact the Zoos SA Education azes@zoossa.com.au

All images in the booklet are copyright of the Royal Zoological Society of South Australia.

© 2005 The Royal Zoological Society of South Australia and the Department of Education and Children's Services, South Australia
Updated Dec '10

This Outreach Education program for schools is a partnership between Zoos SA and the Department of Education and Children's Services, South Australia. Outreach Education is a team of seconded teachers based in public institutions who are managed through the Open Access College.

AZES contact details

Phone: 8267 2434

Fax: 8239 1329

Email: azes@zoossa.com.au

Website: www.zoossa.com.au

For the Teacher

General Information

Welcome to Adelaide Zoo!

The Zoo is a great place for learning. Adelaide Zoo Education aims to support student learning by providing resources to assist classes to have educational and enjoyable experiences at the Zoo.

This booklet will provide a range of activities which may be undertaken by your students during their visit to the Zoo. A map and suggested order of activities is provided to give a logical circuit to travel during the visit.

Animal species change from time to time, and sometimes animals are “off limits” or out of sight during visits, so a flexible approach to completion of activities is recommended.

In planning, please consider whether

- ◆ you would like your class to regroup for lunch, animal feeds, the Discovery Zone or at the Entrance at the end of the visit. If so, relay the times and meeting places to students or supervisors (in writing if possible.)
- ◆ you would like to see the Pandas or use the Nocturnal House: if so, book a time when making the Zoo booking so your students are not disturbed by other school groups.
- ◆ you would like a session with a Zoo Education Officer to support your study theme. Lesson requests are met wherever possible, though at busy times of the year you may need to have a few options with dates to enable a time to be negotiated. Again, this time is arranged at the time of booking your class visit.

If your class is not booked in to a program involving an Education Officer, we will attempt to meet your class at the Entrance on arrival at the Zoo. At this meeting the group will be welcomed and given some information about the Zoo to assist their visit. General behaviour expectations will also be outlined.

Specific information relating to this Zoo Trail will follow for the teachers and for adult supervisors. Please ensure that supervisors have a copy of the relevant pages **before they come to the Zoo** so they can also be mentally prepared to maximise the learning for the students in their care.

Habitat Trail – Primary

Teacher Information

Pre-visit ideas

- ◆ The 'background information' at the front of this Trail discusses features of 4 habitats, Rainforest, Coastal, Wetlands and Desert. If information about other habitats is required, you and/or the students will need to do further research.
- ◆ Help students to understand that animals that live in a particular habitat possess adaptations that help them to survive in that environment. Identify some, eg colour for camouflage, limbs for climbing, running, swimming, digging, methods of keeping cool or warm, etc, etc.
- ◆ Research to find out where all of the world's Rainforests, Deserts, etc. are located. Mark these on a map of the world, using different colours for different habitats.

Post-visit ideas

- ◆ Students each choose an animal and research to find out about its habitat. They should then find out about special features of the animal (adaptations) that help it to survive in its habitat.
- ◆ Students research a chosen habitat and build a diorama or model of it with appropriate animals.
- ◆ Students list all of the 'things' that animals get from their habitat, ie relationships.
- ◆ Students have a debate on the topic of "Draining a wetlands area for a resort development." Students could argue from the points of view of
 - Animals
 - Land developers
 - Neighbouring farmers
 - Government
 - Public
- ◆ Students draw a South East Asian rainforest, showing the different layers. They then place in it, at the right level, pictures of animals from this habitat. Eg. Malayan Sun Bear, Tapir, Siamang, Dusky Leaf Monkey, Oriental Small Clawed Otter, Sumatran Tiger, Binturong, Orangutan, Peafowl and Pheasants.

Links to SACSA framework

Science- Earth and space

- 3.1 Describes the characteristics that sustain life on Earth and changes to the characteristics and their impact over time

Science- Life systems

- 2.5 Explores the relationships between living things by posing investigable questions about features and functions.
- 3.5 Explains the interrelationships between systems within living things and between living things in ecological systems. They relate these ideas to the health of individuals and to threats to the sustainability of ecological systems.

Society and Environment- Place, space and environment

- 2.4 Shows and reports on understanding of the interrelationships between natural and built environments, resources and systems.
- 3.4 Identifies and describes significant resources, explains the threats which endanger them and suggests strategies to combat threats.
- 3.5 Identifies factors affecting an environmental issue and reports on ways to act for sustainable futures

Essential Learnings:

Futures,
Interdependence,
Thinking,
Identity

Key competencies:

KC1 – collecting, analysing and organising information
KC2 – communicating ideas and information
KC6 - solving problems

Background notes for teachers and supervisors on the day.

- ◆ This Trail involves students visiting a selection of enclosures depicting different Habitats.
- ◆ Students will be using their observations skills, reading signs and will perhaps have the opportunity to speak with a Keeper to answer questions about the Habitat Enclosures they visit. Your guidance and suggestions will also assist the students in your group.
- ◆ Students will be learning about various aspects of the different types of habitat, finding out which animals live in them and the relationship that exists between the animals and their habitat.
- ◆ Each student does not have to do the whole Trail. However, by allocating different parts to each group, the whole Trail can still be completed as a class.

Key:



Observe carefully



Discuss and share ideas with your group



Write down your thoughts



Did you know?

HABITATS – Background Information

RAINFORESTS

- ◆ Cover only 7% of the world's land area, yet it is estimated that rainforests contain between 50% and 90% of all the earth's plant and animal species.
- ◆ Features include tall trees with thick canopy, which keep in heat, creating a natural 'hot-house' for propagation.
- ◆ Green Factory – converting raw materials (sunlight, water, CO₂) into useable energy (carbohydrates) by the process known as photosynthesis.
- ◆ Lungs of the World – more O₂ is produced per hectare than in any other land ecosystem.
- ◆ Structure:
 - Emergents
 - Canopy (+ emergents)
 - Understorey
 - Forest floor
- ◆
 - 56% of land in Central and South America is Rainforest
 - 26% of land in Asian tropics is Rainforest
 - 18% of land in West and Central Africa is Rainforest
 - A small area of land in North Queensland is Rainforest
- ◆ Rainforest worldwide is being destroyed at a rate of 60 Hectares a minute (60 football ovals).
- ◆ Many developing countries are in debt to richer countries. They fell rainforests and sell the timber to help pay back their debts.
- ◆ Many rainforests are being cleared for timber, wood chip, then cattle ranching, soya bean cultivation or palm plantations – to provide building material, paper, food and cosmetics for world markets.

WETLANDS

- ◆ Rivers, streams, lakes, swamps, billabongs, soaks, tidal mudflats and estuaries are all wetlands, freshwater or saline.
- ◆ Soils and landforms are built in wetlands.
- ◆ Wetlands act as 'sponges' for floodwaters, extracting sediments, recycling nutrients and oxygenating water.
- ◆ Wetlands support plants, invertebrates, fish, reptiles, amphibians, birds and mammals.
- ◆ Approximately 180 species of birds depend upon Australian wetlands to some extent, 50 of which are restricted to them.
- ◆ Wetlands are important sources of fish, crustaceans, shellfish and other food for people.
- ◆ Wetlands are the source of water that sustains agriculture, industry, towns and cities.
- ◆ In many places wetlands have been drained and filled to turn them into pasture and farms, housing, industrial estates and tourist development.
- ◆ Damming of rivers can flood wetlands and change the ecology.

- ◆ Things that are dumped in streets, like oil, litter, detergents and waste products are washed into storm water drains and end up in waterways.
- ◆ Insecticides and sprays used for agriculture also often end up in wetlands.

DESERTS

- ◆ Deserts are usually very, very dry and even the wettest deserts receive extremely low rainfall – less than 150mm in an average year.
- ◆ Most deserts are habitats that experience extremes of heat or cold and dryness. Many get their rain in sudden flash floods.
- ◆ Due to the harsh conditions, some deserts are named accordingly, eg “Death Valley”, “the Empty Quarter” and “the place from where there is no return”.
- ◆ During the day many deserts are very hot. Temperatures near 40°C are not uncommon. However the same deserts can have temperatures falling dramatically during the nights with heat radiating from the land through the clear skies into space.
- ◆ There are also some ‘cold deserts’ in the world, eg Antarctica, Gobi and Turkestan.

COASTAL

Coastal habitats may include rocks, inter-tidal zones, river estuaries, beaches and sand dunes. Some of the animals living in coastal habitats obtain their food from the area itself while others feed in the sea, but rest and breed on land.

Hooded plover – Problems with humans

- ◆ Hooded plovers nest on the ground in the sand dunes. Their chicks live in the dunes until they are old enough to join their parents eating at the water’s edge.
- ◆ Many suitable coastal areas for them to live and breed are now the site of holiday houses or towns.
- ◆ Holiday makers in 4 Wheel Drive vehicles drive on the beach and in the dunes. The tracks they leave are used by young Hooded plovers as shelter as they are unable to fly. When disturbed they press their body flat to the sand and are run over by other vehicles using the same tracks. Dune buggies penetrate the sand dunes and run over many eggs and chicks.
- ◆ Adult birds are easily scared off nests by human activity, leaving the chicks and eggs unattended and easy prey to seagulls, ravens and goannas.
- ◆ Foxes, dogs and cats follow human “footprints” that go close to nest sites.

TEMPERATE DECIDUOUS FOREST – PANDA

- ◆ Giant Pandas live in thickly forested mountainous areas at altitudes of 1200 to 14,000 meters in South Central China.
- ◆ These forests contain evergreen bamboos and deciduous trees as well as ferns and flowering plants.
- ◆ Giant pandas move around their habitat area in search of bamboo groves where they feed. Bamboos are large grasses with woody stems known as culms. Pandas eat the stems (culms), leaves and shoots.

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18

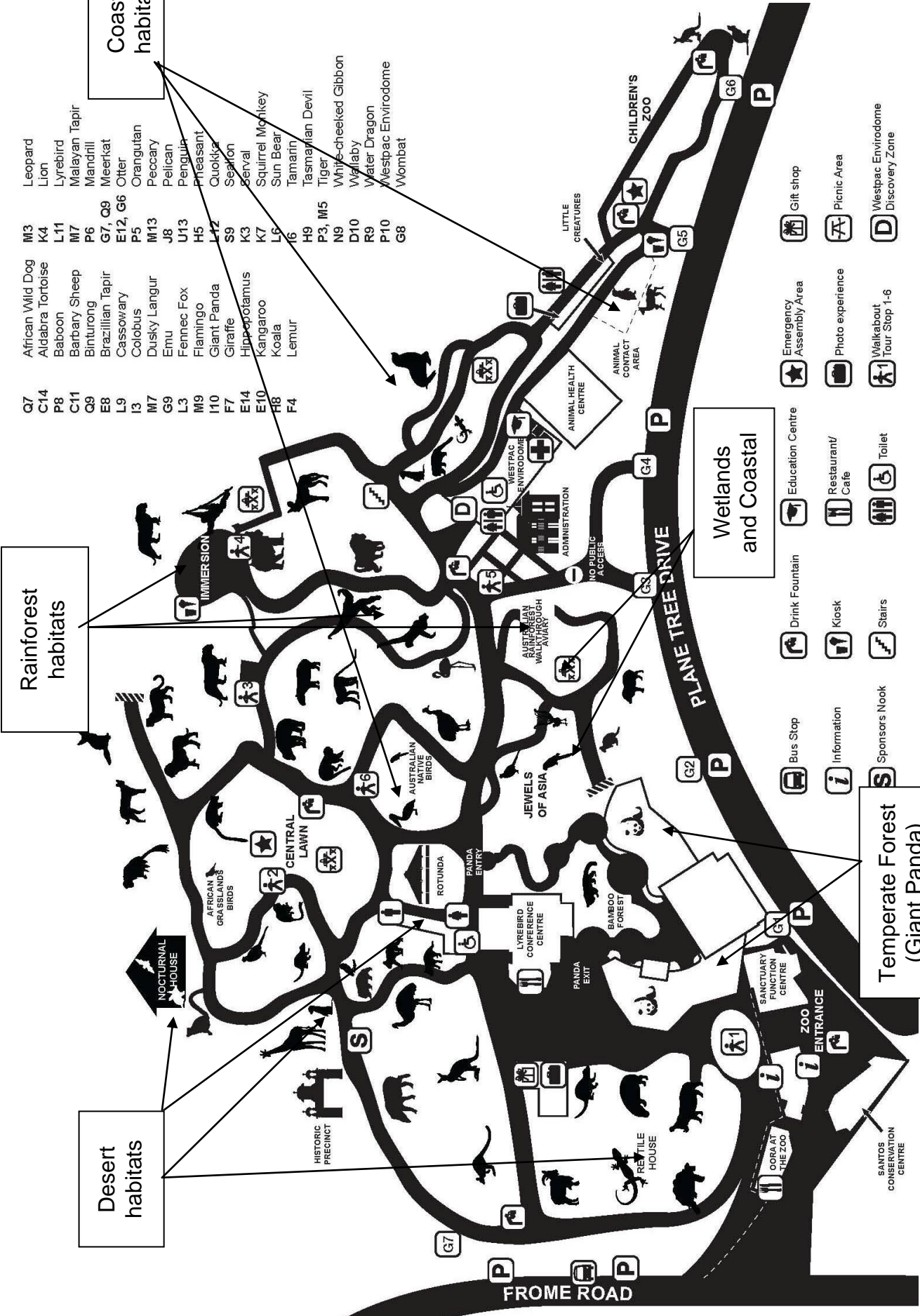
Desert habitats

Rainforest habitats

Coastal habitats

- Leopard
- Lion
- Lyrebird
- Malayan Tapir
- Meerkat
- Otter
- Orangutan
- Peccary
- Pelican
- Penguin
- Pheasant
- Quokka
- Seahorse
- Serval
- Squirrel Monkey
- Sun Bear
- Tamarin
- Tasmanian Devil
- Tiger
- White-cheeked Gibbon
- Wallaby
- Water Dragon
- Westpac Envirodome
- Wombat

- Q7 African Wild Dog
- C14 Aldabra Tortoise
- P8 Baboon
- C11 Barbary Sheep
- Q9 Binturong
- E8 Brazilian Tapir
- L9 Cassowary
- I3 Colobus
- M7 Dusky Langur
- G9 Emu
- L3 Fennec Fox
- M9 Flamingo
- I10 Giant Panda
- F7 Giraffe
- E14 Hippopotamus
- E10 Kangaroo
- H8 Koala
- F4 Lemur
- M3 Leopard
- K4 Lion
- L11 Lyrebird
- M7 Malayan Tapir
- G7, Q8 Meerkat
- G6 Otter
- P5 Orangutan
- M13 Peccary
- J8 Pelican
- U13 Penguin
- H5 Pheasant
- L12 Quokka
- S9 Seahorse
- K3 Serval
- K7 Squirrel Monkey
- L6 Sun Bear
- H9 Tamarin
- P3, M5 Tasmanian Devil
- N9 Tiger
- D10 White-cheeked Gibbon
- R9 Wallaby
- P10 Water Dragon
- G8 Westpac Envirodome





- Gift shop
- Picnic Area
- Westpac Envirodome Discovery Zone
- Emergency Assembly Area
- Photo experience
- Walkabout Tour Stop 1-6
- Education Centre
- Restaurant/Cafe
- Toilet
- Drink Fountain
- Bus Stop
- Information
- Sponsors Nook
- Kiosk
- Stairs
- Restroom
- Drinking Water
- Animal Health Centre
- Animal Contact Area
- Little Creatures
- Immersion
- Central Lawn
- Historic Precinct
- Desert habitats
- Rainforest habitats
- Coastal habitats
- Wetlands and Coastal
- Temperate Forest (Giant Panda)
- Frome Road
- Plane Tree Drive
- Zoo Entrance
- Santos Conservation Centre
- Ornate House
- Retail House
- Lyrebird Centre
- Rotunda
- Panda Entry
- Panda Exit
- Bamboo Forest
- Jewels of Asia
- Australian Native Birds
- Australian Walkthrough Aviary
- Administration
- Westpac Envirodome
- Animal Health Centre
- Animal Contact Area
- Little Creatures
- Children's Zoo

Wetlands


? Rivers, streams, lakes, swamps, billabongs, soaks, tidal mudflats and estuaries are all wetlands - fresh or saltwater.

Areas that would be suitable to visit for this activity are the southern end of the Australian walk through Rainforest aviary and swamp aviary diagonally opposite the Peccary.

 Observe these wetland areas and note some of the features of them, eg soil, vegetation, wildlife etc.

 How could the following benefit from these wetland areas? (eg source of food, water for crops and animals (farm)).


Camper / tourist _____

 Farmer _____

Bird _____


Frog _____

Water rat _____

 Think of other ways that agriculture, industry, towns and cities could be serviced, using wetlands.


 _____

Suggest any problems that hosing down driveways, dumping oil in gutters and spraying insecticides may pose for rivers, creeks and the ocean.

 _____

How could this affect food chains in wetland areas?

 _____

 _____

Make some suggestions about what people could do (instead of dumping oils etc) to overcome the problems.





Unfortunately, sometimes wetlands are developed by draining and filling the land for use as pasture and farming, housing, industrial estates and tourist development.



What effects would there be if a wetland area, eg like the one in the walk through aviary, was drained and filled?

On animals: _____



On people: _____

On farms: _____



(Wetlands are a good means of 'nutrient' recycling' and so soil quality would be affected!)

Something to think/talk about!




As a responsible land developer, how would you deal with a situation where there were wetland areas on land where you plan to develop say, a hotel-motel or resort?








Deserts


Desert habitats are set up in many Zoo areas: Desert Birds in the aviary between the male and female toilet blocks, Desert Reptiles in the Reptile House and Desert Mammals in the Nocturnal House (eg. Hopping mice, Bilby) and other areas such as Meerkats, Hamadryas baboons and Fennec fox.


 Have a careful look at the 2 of the Desert habitats: the physical surroundings of the animals and the plants.

 Why are there so few plants in Deserts?

 Describe any special features of the plants that are found in this area that help them to survive in a desert habitat.



 The night times in deserts are often very cold – even below freezing. Explain how 2 of the desert animals you see at the Zoo would survive those cold nights.




Desert animal	How it survives at night

A lot of desert animals are nocturnal – active at night and sleep in the day.

Can you draw a nocturnal animal, in its habitat, in the space below?



Can you think of a few reasons why a lot of Desert animals are nocturnal?



Coastal

Enclosures that would be suitable for this activity are Penguins, Sealions, Pelicans and the Coastal Aviary diagonally opposite the Peccary.



Make sure you visit some of these enclosures and observe some of the features of Coastal habitats. Look at the plants, soil etc.



Can you make a short **list** of what the habitat provides for the animals that live in these areas?





Holiday makers and 4WD vehicles, such as dune buggies, have a huge impact on these regions.

How can humans have a negative effect on the coastal habitats?



Suggest ways that animals, such as foxes, dogs and cats could be a problem for native animals living in a Coastal environment.





In the case of the Hooded plover, adult birds are scared off easily by human activity, leaving any young or eggs as prey to seagulls, goannas and ravens.

Make some suggestions about how people should act responsibly when they are visiting coastal areas.



Tropical Rainforests

Areas of the Zoo that would be suitable for this activity include South East Asian Rainforest, the Australian Rainforest Walk-through Aviary and the Jewels of Asia Aviary

? Rainforests cover only 7% of the world's land area, yet they contain between 50 - 90% of all the Earth's plant and animal species!

What would you expect the weather conditions to be like, most of the time, in a Tropical Rainforest?



cold

dry

humid

hail

wet

hot

snow

?

These conditions are ideal for growth of new plants

What does a Tropical Rainforest look like? Use the cylinders at the entrance of the South East Asian Rainforest exhibit to find out.

DRAW your own rainforest below showing the different layers and plants. (Sketch the main features now & do this activity later!)

Emergents
(40 m)

Canopy
(30 m)



Understorey
(< 20 m)

Forest floor
(ground level)

As you move through this exhibit observe each animal and write in what part of the Rainforest you would expect them to live, ie Canopy, understorey or forest floor).



Malayan sun bear _____

Peafowl _____

Mandarin duck _____

Dusky leaf monkey _____

Siamang _____

Malayan tapir _____

Sumatran tiger _____



DRAW these animals in the 'Rainforest' you have sketched. (Do this later!)

Do you think much light would reach the forest floor? _____



Why? _____

What colours would animals be that live beneath the canopy down to the forest floor if they were to be well camouflaged? (Hard to see! Visit the Cassowary if you need help!)





What food would be available for these animals that live in a Rainforest?

Malayan sun bear _____

Peafowl _____



Mandarin duck _____

Siamang _____

Malayan tapir _____

Sumatran tiger _____

Now! Consider why the destruction of such areas can be so damaging to animals whose home is a Rainforest!



Unfortunately, Rainforests are being destroyed at an alarming rate. In fact, an area of 60 hectares, is being cleared around the world every minute!!!



Use the following key words to help you to suggest some reasons why the destruction of Rainforests is taking place:

Transport _____



Tourism _____

Cattle ranching _____

You may have other suggestions of your own or you can **RESEARCH** to find out more!

Temperate Deciduous Forests

The area of the Zoo that would be suitable for this activity is at the Giant Panda enclosures.

BAMBOO – the Giant Pandas' main source of food

Bamboo is a type of grass, which can grow as high as trees. There are hundreds of different species of bamboo, but Pandas only eat about 20 of them – most of the time only four or five kinds which are most plentiful in the area they live.

Although they prefer tender bamboo shoots and leaves, they will remove the tough outer covering of 4 cm diameter stems to reach the soft inner layers.

?



Are the Pandas eating anything? If so, what type of food is it?

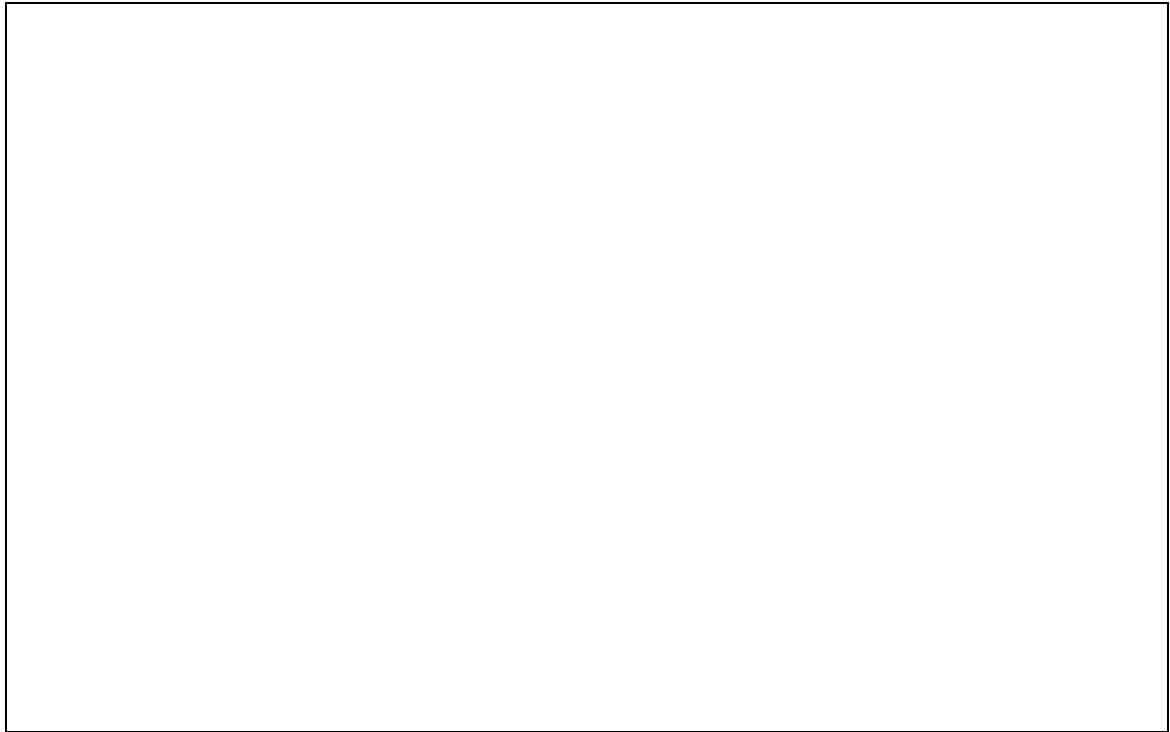
?



A Giant Panda's diet is almost exclusively bamboo, sometimes other plants, fruits and small mammals (rodents, deer fawn).

They have wide teeth that are adapted for crushing tough bamboo.





Draw a section of the enclosure below that shows you their habitat, including bamboo.

Like with any animal and their habitat, a Giant Panda relies on its habitat for shelter, finding mates, protection and food.

Discuss and then complete the **Food Web** below. It's already been started for you!

