

ADELAIDE
ZOO



Adaptations



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Acknowledgements

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Updated December '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.

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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.

Adaptations Trail- Primary

TEACHERS INFORMATION

Consider the amount of material in this trail, the time you will spend in the Zoo and the age and capacity of your students. You may like to put the activities in order of preference, make a selection from the activities for your class or share the activities amongst groups so each group does say 4 or 5 activities.

Pre-visit ideas

- Research an animal. Find out about its natural habitat, predators, food source and the adaptations it has to help it survive.
- Collect recycled materials and use these to construct habitats.
- Write letters to wildlife protection programs, local councils or newspapers.
- Consider the food chains of various regions and find out what happens if one of the species disappears. Look at the adaptations each animal has to help it find and eat its food.
- Make a list of all the adaptations humans have and how they help us.
- Design and implement a recycling program for the school/community/home.
- Group animals into the habitats that they come from, then compare adaptations that they have.
- Write one day of the diary of an animal, explaining how it uses its paws/teeth/claws or other adaptations in everyday life.

The following words and terms would be useful as prior knowledge to your visit to the zoo:

- Threatened Species
- Habitat
- Adaptations

Post visit ideas

- Design an enclosure for a zoo animal, considering its needs and natural habitat. Construct the enclosure using recycled materials.
- Collect newspaper articles related to animals
- Research what wildlife organisations and zoos are doing to help Threatened Species.

Assessment Ideas

The questions and tasks in the trail are designed to encourage original ideas and thinking. There is not necessarily a correct answer for each question. In most cases answers should vary from group to group, indicating independent thinking.

Other ways to assess the students work on this topic could include:

- Writing a report about the visit to the Zoo.
- Giving an oral presentation on the adaptations of their favourite animal.

Links to SACSA framework

Science- Earth and Space

- 2.1 Expresses ideas about changes that occur in their local environment and considers implications for sustainable environments.
- 3.1 Describes the characteristics that sustain life on earth and changes to the characteristics and their impact over time.
- 3.5 Explores 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 sustainability of ecological systems.

Society and Environment- Place, space and environment

- 2.6 Understands that people cause changes in natural and social environments and they act together in solving problems to ensure ecological sustainability.
- 3.4 Identifies and describes significant resources, explains the threats which endanger them and suggests strategies to combat threats.

Background notes for teachers and supervisors on the day.

This trail is designed for students to work individually, in pairs or in small groups.

Students visit a number of native and exotic species, looking at the habitats they live in and adaptations they have to help them.

Students are encouraged to use their observational skills, to read signs and to talk to Zoo staff. Supervisors should encourage students to discuss ideas and express their own point of views.

Key



Observe carefully



Discuss and share ideas with your group



Write down your thoughts

Australian Sealions

Sealions are mammals so they are covered in hair.

They are covered in thick fur to help keep them warm in the cooler waters.

The whiskers on their noses help them feel the vibrations in the water when they are searching for fish in the deep seas.

The dark colourings of the sealions fur help them to camouflage in the dark waters so they stay safe from predators. Their two back flippers also allow them to clamber up large rocks where they can get away from sharks and other threats in the water.

The sealions large flippers and strong body help them to swim deep into the ocean. Their lungs can hold large quantities of air so they can hold their breath for a long time. Sealions can also swallow rocks. This extra weight helps them to sink further into the water.

Koala

Koalas spend lots of time in the trees because it is where they find their food. They are also safe from predators when hidden in the trees.

Koalas have two thumbs on each hand. This gives them extra grip when climbing.

Koalas have adapted to be able to eat *Eucalyptus* leaves while other animals can not. We call this a bodily function adaptation.

Siamangs

Siamangs like to stay high in the trees where they find the fruit, seeds, nuts and leaves to eat. They are also safe from predators such as tigers and bears.

Baby siamangs need to cling tightly to their mothers within hours of their births otherwise they would fall from the trees. The parents need both hands to swing through the trees and to gather food, so young siamang need to hold on for themselves.

Siamangs, like many primates, can not swim. Therefore they do not try to get across the water that surrounds their island enclosure at the Zoo.

To help them swim out of their enclosure the Siamangs may need flippers, webbed feet or waterproof fur.

Reptile House

Structural adaptations of reptiles could include patterns on the skin, shells, shape of skulls, teeth or body size.

Behavioural adaptations could include where a snake spends most of its time, how it rattles its tail or lies very still so it cannot be seen.

Bodily function adaptations could include the venom some snakes' bodies make, or the way they produce a white paste instead of urine to get rid of wastes from their blood (saving water inside their bodies).

Giraffe

A giraffe's habitat is the savannah and woodlands of Africa.

It uses its long tongue to pull off the leaves from trees. Its neck is used to reach the leaves high on the trees.

Patterned fur helps the giraffe to stay camouflaged in the woodland surroundings.

It is important for baby giraffes to be able to stand soon after birth. Giraffes are constantly roaming in search of food. If a young giraffe was not able to stand it would be left behind and therefore at risk of being eaten by predators.

Other animals that share the grassland habitat with the giraffe are zebras, wildebeests, lions, elephants and antelope. Many of these animals have similar adaptations, especially the grazing, herd animals like the Zebras and Wildebeests. They have camouflaging patterns on their fur and their babies are able to walk soon after birth.

Australian Aviary - birds

You may notice that many of the wetland birds have webbed feet and longer, skinnier beaks. The webbed feet help them to paddle through the water, while the long beaks are used to catch fish and insects from the water and mud.

The beaks of the rainforests animals are more likely to be shorter. They would be used to catch insects or break open seeds and fruits.

The Nocturnal House

Nocturnal animals are ones that sleep during the day and come out at night. Nocturnal animals usually live in hot, dry climates where it is cooler at night.

This behavioural adaptation helps them stay cool. In the heat of the day they will hide under ground or in the trees then they can forage or hunt for food in the cooler part of the day when the sun is down.

Nocturnal animals are very good at hiding in the darkness of night. They will move around silently in search of food and therefore they are very hard to find - for people as well as their predators or prey. People like the Australian Aboriginals are more likely to see and catch animals that are out during the daytime and easy to find.

Giant Panda

Giant Pandas are classified as bears, with their large head and body like bears and ears that resemble those of brown bears. Their teeth are like those of an omnivore, although they eat almost exclusively bamboo. Other plants, fruits and small mammals and birds are also eaten in the wild. They have a large skull and wide jaw bones with large masticatory muscles that enable the Panda to crush bamboo stems that would otherwise be hard to separate.

The soles of Panda paws are covered with fur and serve as protection against the cold and prevent slipping on snow and ice. Giant Pandas have a pseudo-thumb on each of the front paws which helps them to hold onto their food.

Their black eyespots (black around their eyes) serve as protection against the strong reflection of sunlight in snow during winter.

Giant Pandas have very thick fur that consists of stiff bristles up to 5 cm long and serves as insulation. It also has an oily covering that repels water.

Pandas scent mark to communicate their presence and territory. They also have a repertoire of at least 11 different calls used during mating or between mother and young.

- M3 African Wild Dog
- K4 Aldabra Tortoise
- L11 Lyrebird
- M7 Barbary Sheep
- P6 Binturong
- G7, Q9 Brazillian Tapir
- E12, G6 Cassowary
- P5 Colobus
- M13 Dusky Langur
- J8 Emu
- U13 Fennec Fox
- H5 Flamingo
- L12 Giant Panda
- S9 Giraffe
- K3 Hippopotamus
- K7 Kangaroo
- L6 Koala
- I6 Lemur
- M5 Leopard
- L10 Lion
- R9 White-cheeked Gibbon
- P10 Wallaby
- G8 Water Dragon
- S Westpac Envirodome
- G8 Wombat

Siamangs

Nocturnal House

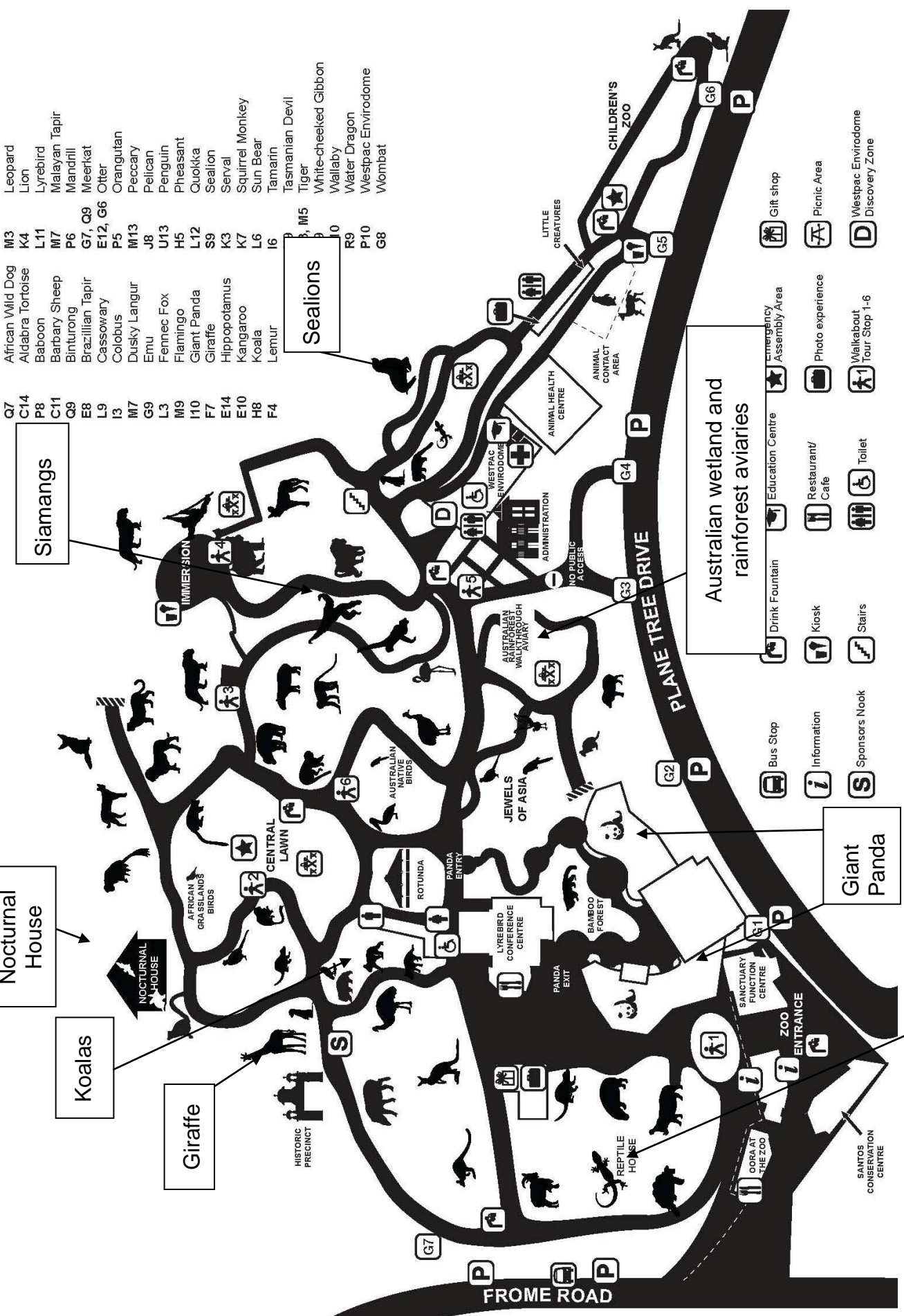
Koalas

Giraffe

Sealions

Giant Panda

Reptile House



Australian wetland and rainforest aviaries

- Drink Fountain
- Education Centre
- Emergency Assembly Area
- Bus Stop
- Information
- Sponsors Nook
- Restaurant/Cafe
- Kiosk
- Toilet
- Photo experience
- Walkabout Tour Stop 1-6
- Gift shop
- Picnic Area
- Westpac Envirodome Discovery Zone

FROME ROAD

PIPLANE TREE DRIVE

Adaptations



When walking around the Zoo today, look closely at the animals and their surroundings.

Adaptations are things about animals which make them better suited to the environment that they live in, and more likely to survive. There are 3 ways that animals are adapted.

- Behavioural adaptations
- Body structural adaptations
- Bodily function adaptations

Fill in this table when you are in the Zoo today.



Animal	Need	Adaptation
Siamang	To reach the fruit in the trees	
	To stay cool in the desert	Nocturnal- comes out at night time
Lion		
		Webbed feet
	To stay warm in the cooler weather	

Water animals - Australian Sealions

You can watch the sealions being fed each day at 11:45am.



Sealions are mammals. This means they are covered in:



feathers

scales

hair



Animals that live in the sea are faced with many problems.



Write the adaptation that sealions have to help them combat some of these problems.



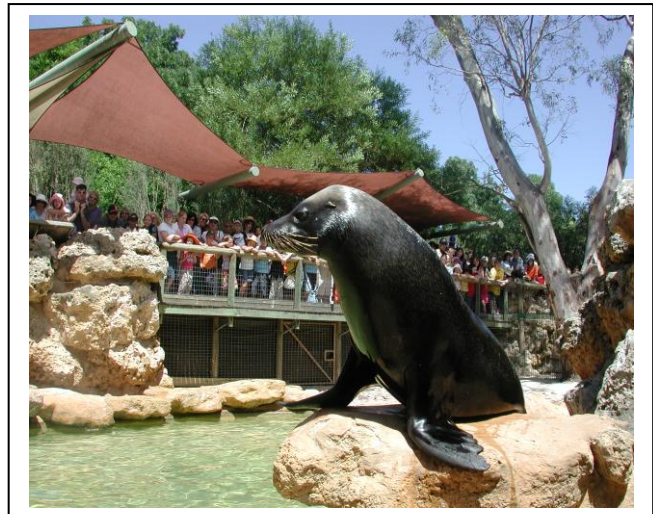
1. They need to keep warm in cold water.

2. They need to find food

3. They need to keep away from predators (e.g. sharks)



Many sealions die each year from becoming tangled in old fishing tackle and rubbish. In your group discuss why sealions have no adaptations do help them in this situation?



Australian Marsupials - Koala

Look closely for the Koalas. They are probably asleep in the trees.



Why do you think Koalas would spend all their time in the trees?



Find out what the special adaptation is on the Koalas hand that helps it to climb. Draw it here.



Most animals would become very sick if they ate Eucalyptus leaves, as their bodies are unable to break down the poisons in them. However, Koalas are able to digest the leaves and they make up 100% of their diet.

What do we call this type of adaptation?



Behaviour

Structure

**Bodily
function**

Adaptations evolve in a population over many generations, usually when the habitat has changed.

What are some of the adaptations that humans from different parts of the world have which help them survive in their natural habitat.

Discuss this with your friends and write down some of your ideas.




Rainforest animals - Siamangs

Many animals in the rainforest, like the Siamangs, spend most of their time in the trees.




 Can you think of two reasons why animals like the Siamang like to stay up in the trees?


 1. _____

2. _____




 The Adelaide Zoo has successfully bred Siamangs in the past. Within hours of their birth, they are able to cling tightly to their mother's bellies.


Why would this be so important?

 _____

 Look at the Siamangs enclosure.

How do the keepers know the Siamangs are not going to get out?

 _____


 What adaptations would the Siamangs need if they wanted to get out of their enclosure?

 _____

You might hear the Siamangs calling during your day. You can hear them over the whole Zoo. This is a way of marking their territory and communicating with each other.

Reptile House

In the reptile House you will find snakes, lizards, turtles, tortoises crocodiles and alligators. They all have special adaptations to help them live in a variety of habitats.

 Find a reptile with each of these types of adaptations.




Adaptation Type	Animal	Adaptation
Structural adaptation		
Behavioural adaptation		
Bodily function adaptation		

Draw your favourite reptile in the reptile house.



Giraffe

The Giraffes at the Adelaide Zoo were born at Monarto. They will return to Monarto after spending a couple of years here.



By looking at the giraffe, its enclosure and the food it likes to eat what do you think its natural habitat would be like?





How would the following adaptations help the giraffe?

Long, strong tongue



Long neck

Patterned fur

Babies able to stand within hours of birth

Draw some other animals found in the same natural habitat as the giraffe.



Discuss with your group how similar/different their adaptations might be. Why?

Did you know that a giraffe's tongue is so long that they can use it to clean their ears?

Australian Aviary - Birds

Part of the Aviary has rainforest birds and the other part has wetland birds. By looking at the plants in the 2 parts of the enclosure see if you can work out which is which.

Choose two birds from each Aviary. Draw their feet and beaks in the table below.



	Name of bird	Drawing of beak	Drawing of feet
Rainforest			
Wetlands			



Is there a difference between the feet and beaks of the birds living in the 2 sections?



How would these body parts help the birds in their habitats?

The Nocturnal House

Move quietly into the Nocturnal House. Remember, these animals think it is night time so it is important to keep your voices right down.

 **What does nocturnal mean?**



Which of the following best describes the habitat where most of these animals live?



Hot and dry with cooler nights

Cold, wet, often snowy

Hot, wet and humid



How would being nocturnal help these animals in this habitat?



Some Australian Aboriginals use native animals for food, clothing and medicines. Many of these animals are also portrayed in traditional stories.

Why would nocturnal animals not be used for these things as much as the other animals?

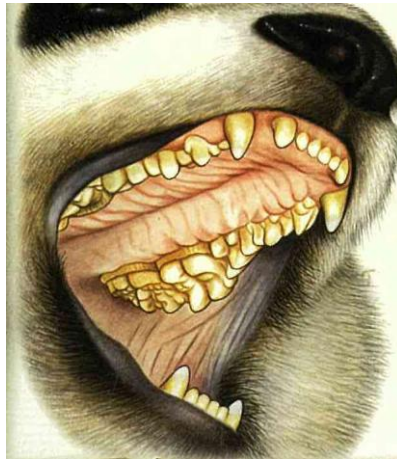



Many of the animals in the Nocturnal house are now Threatened Species. Look for the Rhinoceros symbol to work out which ones these are.

Think about why these animals have become Threatened Species then discuss why their adaptations are not able to help them survive the threats that they are now facing.


Giant Panda

Giant Pandas have a large skull with wide jaw bones and jaw muscles (masticatory muscles). What does this extra jaw strength enable the Pandas to do easily?



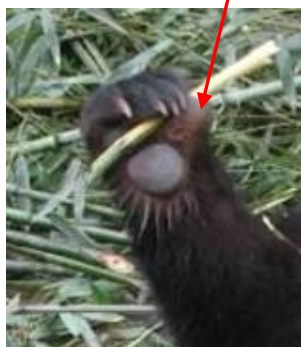
 Can you see either of the Pandas eating? What are they eating? _____


If they're eating bamboo, notice how easy it is for them to rip it apart with their teeth.


 If the Pandas are eating, look how they hold on to their food. They have what is called a 'psuedo thumb', an enlarged bone structure (sesamoid bone) on each front paw, that they use to help them hold on to food. Are they 'holding' anything?



"Thumb"



 Shade the boxes that contain words that describe how the Pandas' fur appears.....



coarse

fluffy

long

dry


soft

short

thick

stiff

wet



Giant Pandas' very thick fur serves as good insulation and has an oily covering that repels water.

Communication between Giant Pandas does not happen often, due to their solitary way of living. However, scent marking is an important way of marking home ranges (territory) and indicating their presence. They have two glands under their tail that produce a secretion that they rub on trees and other objects. Urine also plays an important part in scent marking.

More than 10 different calls are also used to communicate during mating or between mother and young.

 Can you observe or hear any communication taking place with either of the Pandas?