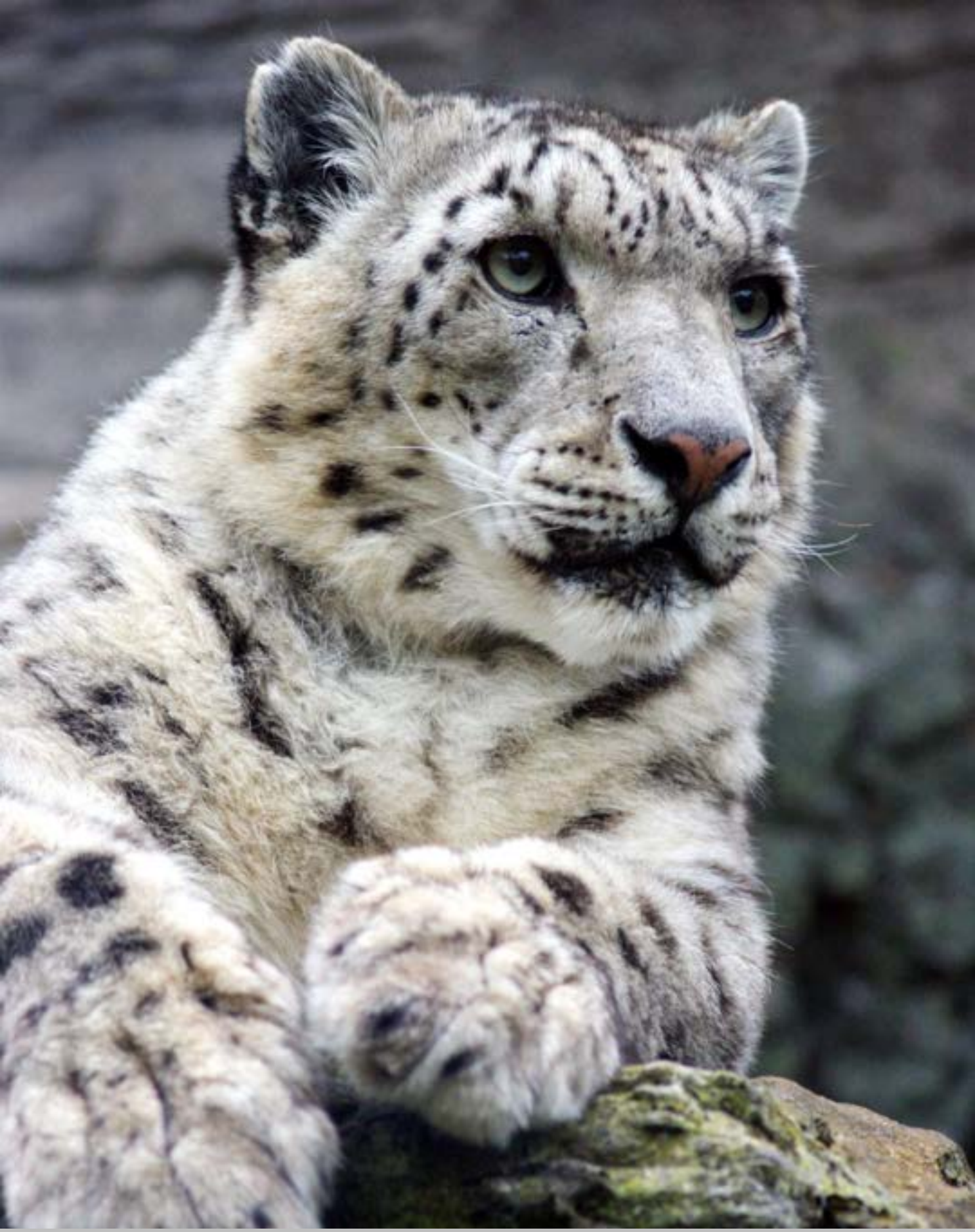
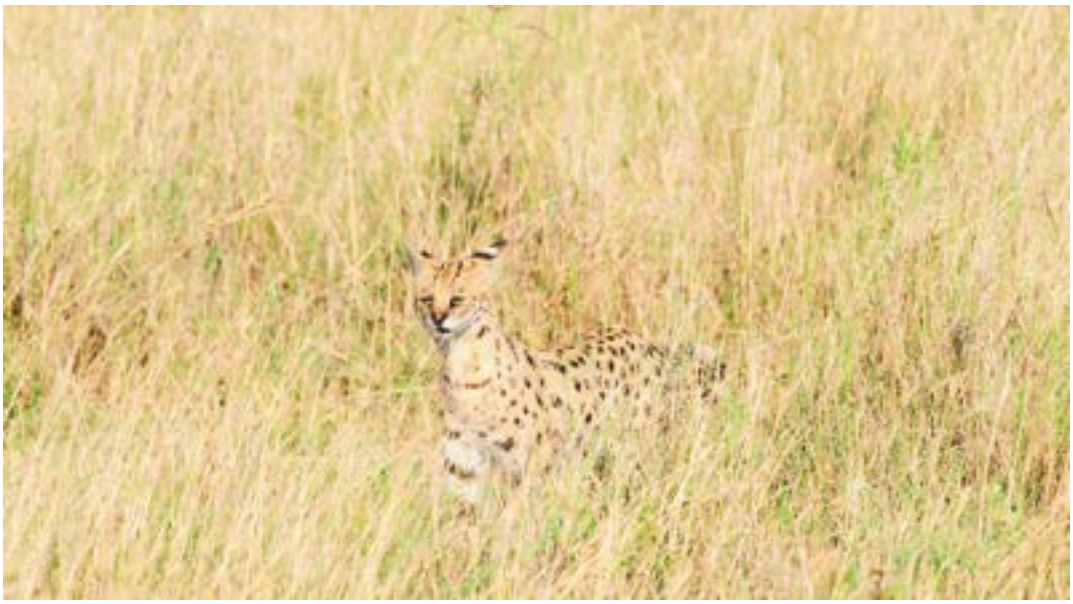


Marwell Wildlife

KS3 Adaptation Trail

Adaptation Trail

The Adaptation Trail is a journey of discovery through Marwell Zoo which allows students to develop and apply their knowledge and understanding of 'adaptation'. It follows the main route around the park, taking in species from a range of habitats; this provides students with the opportunity to see and consider a range of adaptations.
The route of the trail will take approximately 1hour 30mins. There are picnic sites, toilets, shop and café marked on the map. Please allow extra time for any stops.



Curriculum Links

SCIENCE

Genetics and evolution

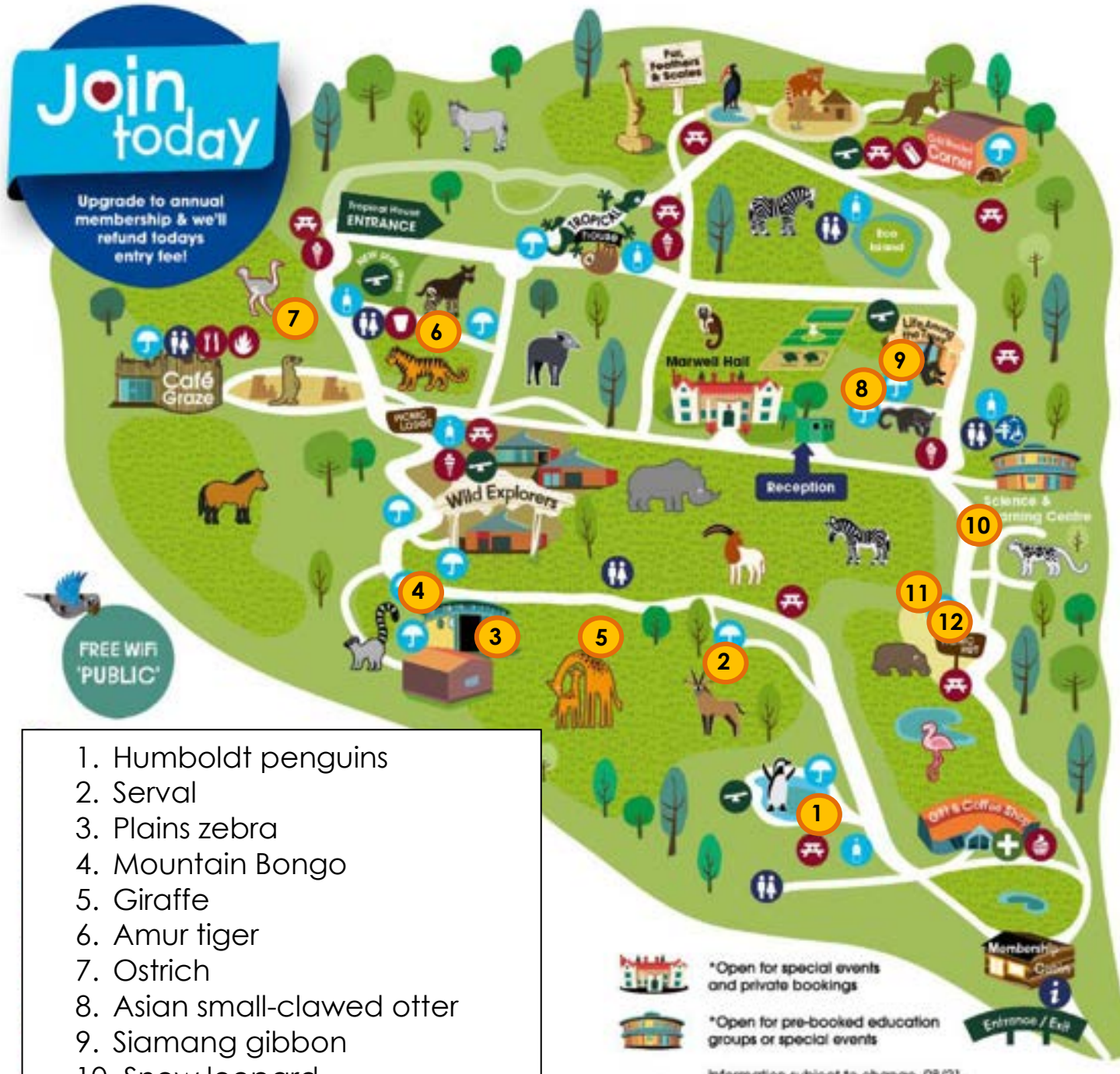
Inheritance, chromosomes, DNA and genes

- differences between species
- the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection
- changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction.

Please remember to print responsibly; booklet form is best. For student trail, print only pages 3-12 answers can be found on pages 13-15.

Adaptation Trail

Marwell Wildlife



1. Humboldt penguins
2. Serval
3. Plains zebra
4. Mountain Bongo
5. Giraffe
6. Amur tiger
7. Ostrich
8. Asian small-clawed otter
9. Siamang gibbon
10. Snow leopard
11. Pygmy hippo
12. Lowland tapir

Name: _____

Adaptation Trail

Welcome to Marwell Zoo!

You are about to go on a journey of discovery around the zoo to find out more about how different animals are suited to their environment.

First, let's remind ourselves about the types of habitats animals might live in as this affects their adaptations. See if you can match up the habitats below with the correct picture and characteristics:

Rainforest	Hot and dry, little plant life	
Desert	Hot, enough rainfall for grass growth	
Mountain	Hot, high rainfall, tall trees and dense vegetation	
Savannah	Can be steep/rocky, temperature decreases with altitude	
Coastal	Where the sea meets the land	

You will be looking at lots of different animals and the adaptations that they have to survive in different habitats.

You will need to collect information on some of these animals and record it on the sheets provided – some of the information is on signs on the animal enclosures; sometimes you have to watch the animals to work the answers out!

1. HUMBOLDT PENGUIN

In what habitat does it live? _____

What are their wings like and what do these help penguins to do?

_____

What other adaptations help these birds to live? How?

Adaptation: _____

Useful because: _____

Adaptation: _____

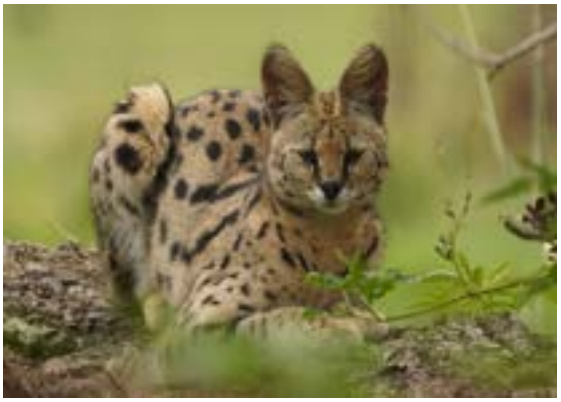
Useful because: _____

2. SERVAL

What habitat do these cats live in? _____

Can you spot this pattern on the serval? How might this pattern be useful to serval?

_____



What do you notice about the Servals ears and legs compared to its body size?

_____

How might having this adaptation be useful for hunting in the wild?

_____

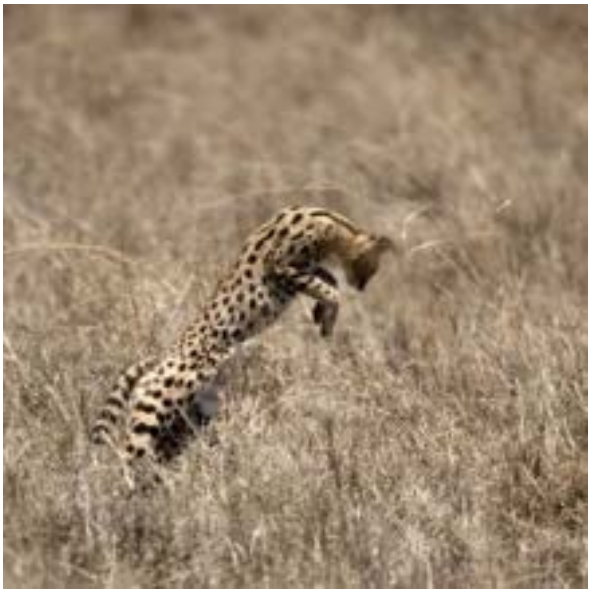
_____

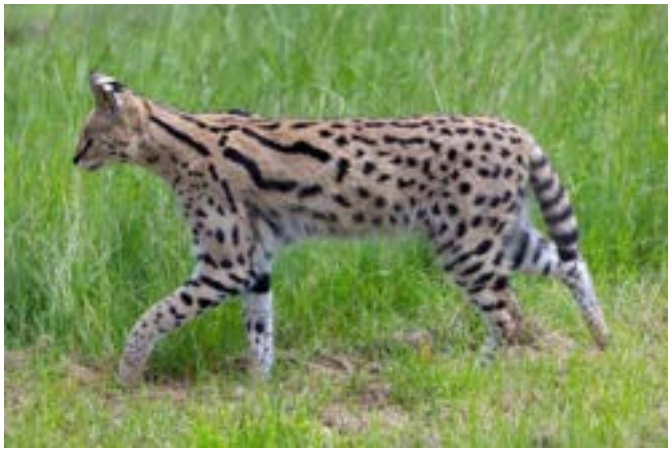
_____

_____

_____

_____





3. PLAINS ZEBRA

Which habitat does the zebra prefer? _____

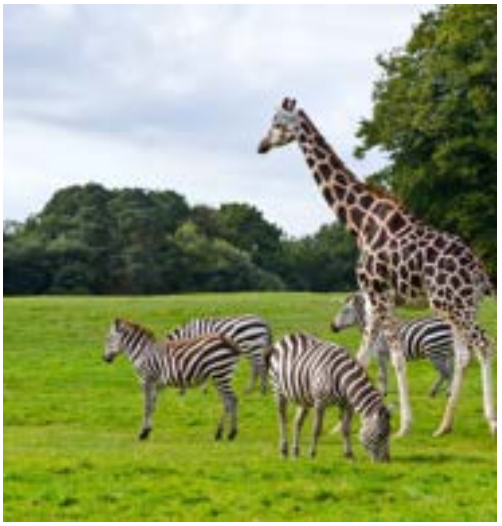
Zebra stripes can confuse predators when they are running in a herd, but how might they help to keep the zebra cool in the heat of the African sun?

_____

_____

Why do you think plains zebra graze near giraffes in the wild?

_____



4. MOUNTAIN BONGO

What habitat does it live in? _____

Why do you think this animal's horns point backwards? _____

_____

How do you think its stripy coat helps it to survive in its habitat?

_____

_____

5. GIRAFFE

This is the tallest land animal in the world.

What habitat does it live in? _____

What two adaptations do giraffes have to make them so tall?

1. _____

2. _____

Give two reasons why being so tall is useful for a giraffe:

1. _____

2. _____

A giraffe's tongue is 46-50cm long. Why is this useful to giraffes?

_____

_____

_____

_____

_____

6. RING-TAILED LEMUR

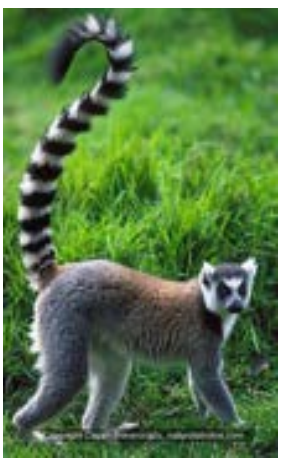
What habitat do ring-tailed lemurs live in? _____

Suggest two adaptations that these lemurs have to help them live in this habitat:

1. _____

2. _____

Ring-tailed lemurs live in large social groups. It can be difficult to keep track of the whole group when they spread out to look for food. Ring-tailed lemurs use their tails to help stay in view- can you describe how?



_____

_____

_____

_____

There are over 100 different types of lemur found on the island of Madagascar. What has caused so many different adaptations to occur in this species?

_____

_____

_____

_____

_____

7. AMUR TIGER

In which type of habitat does the Amur tiger live?

Amur tigers are the top predator in their home in the far east of Russia and china. Like all cats they have several adaptations for hunting and eating their prey.
List 3 adaptations the amur tiger has for hunting.

1.

2.

3.

8. SIAMANG

In which type of habitat are the siamang found?

Identify 2 adaptations these gibbons have to help them move through the trees:

1.

2.

Listen out for gibbons whooping as you go around the zoo! Siamang gibbons have an inflatable throat sac that allows their hooting to travel long distances.
Why might this be useful in their habitat?

9. ASIAN SMALL-CLAWED OTTER

The habitats you would find these otters in include:

_____

_____

What type of food does this animal eat?

_____

Can you identify two adaptations which help the animal to survive in its habitat?

_____

_____

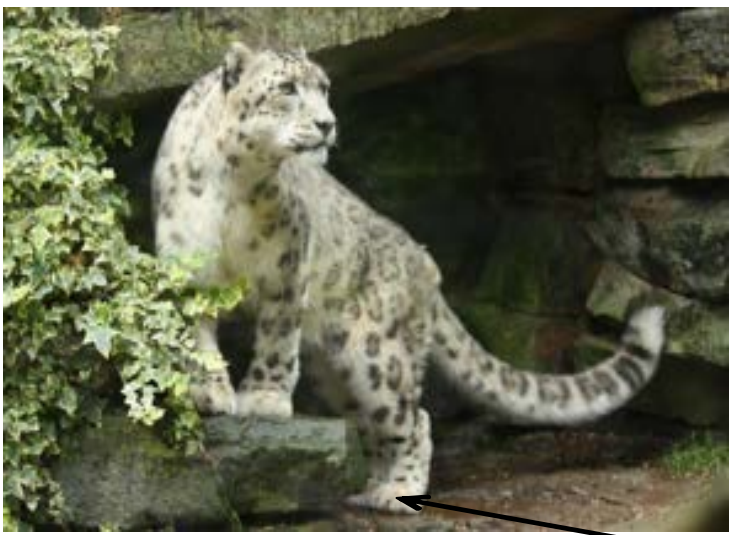
_____

10. SNOW LEOPARD

The habitat you would find snow leopards in is

_____

Try to add at least 3 annotations to the snow leopard below to explain what adaptations it has to help it live in its habitat.
An example has been done for you.



Strong legs/paws to catch its prey and help it move easily though rocky areas

In the box, sketch the markings found on snow leopards. Explain how these markings might be useful to the snow leopard.

_____

_____

11. PYGMY HIPPO

What habitat does it live in? _____

What adaptations does it have to allow it to hide underwater but still see, hear and breathe?

_____

_____

What does the sticky substance produced by the pygmy hippo's skin protect it from?

_____

_____

12. TAPIR

Tapir live in forested wetland habitats and spend their time swimming in water and feeding. One of their major adaptations is their large fleshy nose (proboscis) which they can move around and can use to grasp items.

What type of food does this animal eat?

_____

The tapir's proboscis (nose) is an adaptation that helps them survive in their wetland habitat. Name two ways the tapir uses their proboscis:

Use 1: _____

Use 2: _____

Adaptation Trail answers

1. Humboldt penguin

Habitat: Rocky coasts and cool waters
Wings: Act as flippers to help them swim
Other adaptations: Small spines inside mouth to keep hold of fish; waterproof feathers; streamlined body to move quickly through water; black and white camouflage so can't be easily seen by predators

2. Serval

Habitat: Habitats: Savannah, scrub and open woodland.
Pattern useful for: Camouflage – helps them to hide from their prey in savannah grasses
Hunting adaptations:
Extra large ears: Servals listen for smaller prey such as hares and rodents in the long grass. The exaggerated conical shape of their ears means they have excellent directional hearing they can even pinpoint the location of the naked mole rat moving underground!
Elongated legs: Not only do long legs give the serval a height advantage in the long grass but they also power a mighty 3m jump with which they can catch a bird mid-flight! Having long legs is also handy for reaching down burrows to pluck out unsuspecting prey.

3. Plains Zebra

Habitats: Grasslands and open woodlands
Stripes for keeping cool: Black stripes absorb the heat and white stripes reflect it. When placed close together this results in air turbulence close to the zebra's skin which helps to keep it cool.
Reasons for grazing near giraffe: Giraffes have excellent eyesight allowing them to see both in colour and over long distances, this together with their height advantage makes them ideal as predator watch towers.

4. Mountain bongo

Habitat: Lowland and tropical rainforest
Why backwards pointing horns are useful: Stops them getting caught in vegetation
stripy coat helps it to survive by: providing it with camouflage in the forests so it can hide from predators.

5. Giraffe

Habitat: Savannah or dry, open country and woodland
Adaptations to make it tall: Long legs; long neck
Why being tall is useful: Helps giraffe to reach food; can look out for danger
Long 'prehensile' tongue: Useful for grabbing and picking leaves to eat.

6. Ring-tailed lemur

Habitat: Scrub and forest
Adaptations: Long tail for balance; long fingers for gripping branches
Tail: hold tail up as a flag in the long grass so other lemurs know where they are
Evolution: All lemurs are thought to have evolved from a single ancestor. Over time different lemurs adapted to different diets and different habitats in order to survive. Lemurs are an example of adaptative radiation.

7. Amur tiger

Habitat: Forest and mountain forests
Diet: Deer, wild boar and smaller animals like badgers
Hunting adaptations: Claws for grasping prey, sharp canine teeth to pierce skin and muscle, forward facing eyes, long whiskers to sense movement, fur between paws soften footsteps so tigers can stalk their prey, powerful muscles to chase after and pounce on prey

8. Siamang

Habitat: Rainforest
Adaptations: Long arms for swinging through trees; long fingers to grip branches; forward facing eyes to judge distances
Why might calling be useful: To communicate with each other in dense rainforest; to mark their territory

9. Asian small-clawed otter

Habitat: Wetland areas including lakes, streams, mangroves
Diet: Smaller animals, including crabs, molluscs, fish, small mammals, frogs, insects
Adaptations: Partially webbed feet to aid with swimming, streamlined shape for moving quickly in the water, small claws to help it dig in mud and handle a variety of prey, sharp teeth

10. Snow leopard

Habitat: Cold mountains
Adaptations: Thick fur to protect against the cold; large paws to spread weight so it can move easily through the snow; long tail for balance when moving through rocky areas; furry tail can be wrapped over the face to keep it warm when resting; large teeth for killing and eating prey
Markings: Help snow leopard camouflage to help it hide from and sneak up on its prey

11. Pygmy hippo

Habitat: Wet forests, swamps and streams
Adaptations for hiding under water: Their ears, eyes and nose are on the top of their head
Sticky substance protects it from: The sun – acts as a kind of sunscreen

12. Tapir

Habitat: Rainforest
Diet: Mainly eat browse (the leaves and twigs of trees and shrubs). They also eat fruit and grasses
Use of proboscis: To snorkel so they can breathe underwater, to grasp leaves and twigs from trees so they can eat them