Extreme Environments
Animal Adaptations

Learning Objective

- To explain a range of animal adaptations and how they help survival in different extreme environments.

Success Criteria

- To identify key features of four different extreme environments.
- To explain how key adaptations of different animals helps them survive in their environment.
- To suggest ways in which the example animals may be improved and therefore better suited to their environments.

Key Terms

Environment	the surroundings and conditions an animal lives in.
Survival	the fight to stay alive.
Adaptation	the way an animal has changed to become better able to survive in its environment.
Camouflage	to hide or disguise yourself.
Prey	an animal that is hunted and killed for food.
Insulation	a layer of padding to keep the person, animal or plant warm.
Minimise	to reduce something to its lowest level.
Carnivore	eats meat.
Herbivore	eats vegetables.
Omnivore	eats meat and vegetables.

Environmental Conditions

Organise the descriptors below under the correct headings.

Rainforest	Desert	Mountain	Polar
Very cold temperatures for most of the year.	Hot and dry.	Temperatures rarely go above freezing.	Hot and humid.
Reduced oxygen at higher altitudes.	Competition for water.	A lot of the prey lives in the ocean.	A lot of predators.
Food can be difficult to catch.	Windy and sandstorms.	Very bright sunlight reflecting off the snow.	A lot of leaves.
The rugged ground can be very uneven and cold to walk on.	Long distances between food and water supplies.	The icy ground can be very slippery.	Competition for sunlight, water, food and nutrients.
Very few nutrients in the vegetation.	Burning hot during the day and freezing at night.	Strong glare from the snow and ice.	

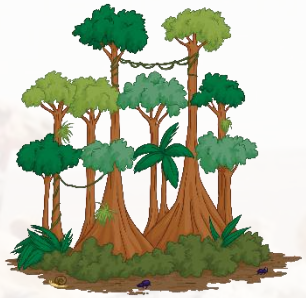
Environmental Conditions Answers

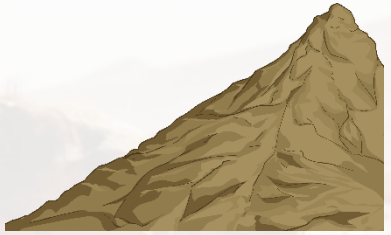
Organise the descriptors below under the correct headings.

Rainforest	Desert	Mountain	Polar
Hot and humid. A lot of predators. A lot of leaves. Competition for sunlight, water, food and nutrients.	Hot and dry. Competition for water. Windy and sandstorms. Long distances between food and water supplies. Burning hot during the day and freezing at night.	Very cold temperatures for most of the year. Reduced oxygen at higher altitudes. Food can be difficult to catch. The rugged ground can be very uneven and cold to walk on. Very few nutrients in the vegetation.	Temperatures rarely go above freezing. A lot of the prey lives in the ocean. Very bright sunlight reflecting off the snow. The icy ground can be very slippery. Strong glare from the snow and ice.

What's the Point?

Your task is to look at four different animals, one from each of the four environments we have described.





Read how they have adapted to their environment and explain how their adaptations help them to survive in their natural environment.

For example:

A piranha has excellent sense of smell so it can hear its prey in the very murky, low visibility waters.

Adaptations of a Camel

Three rows of eyelashes.

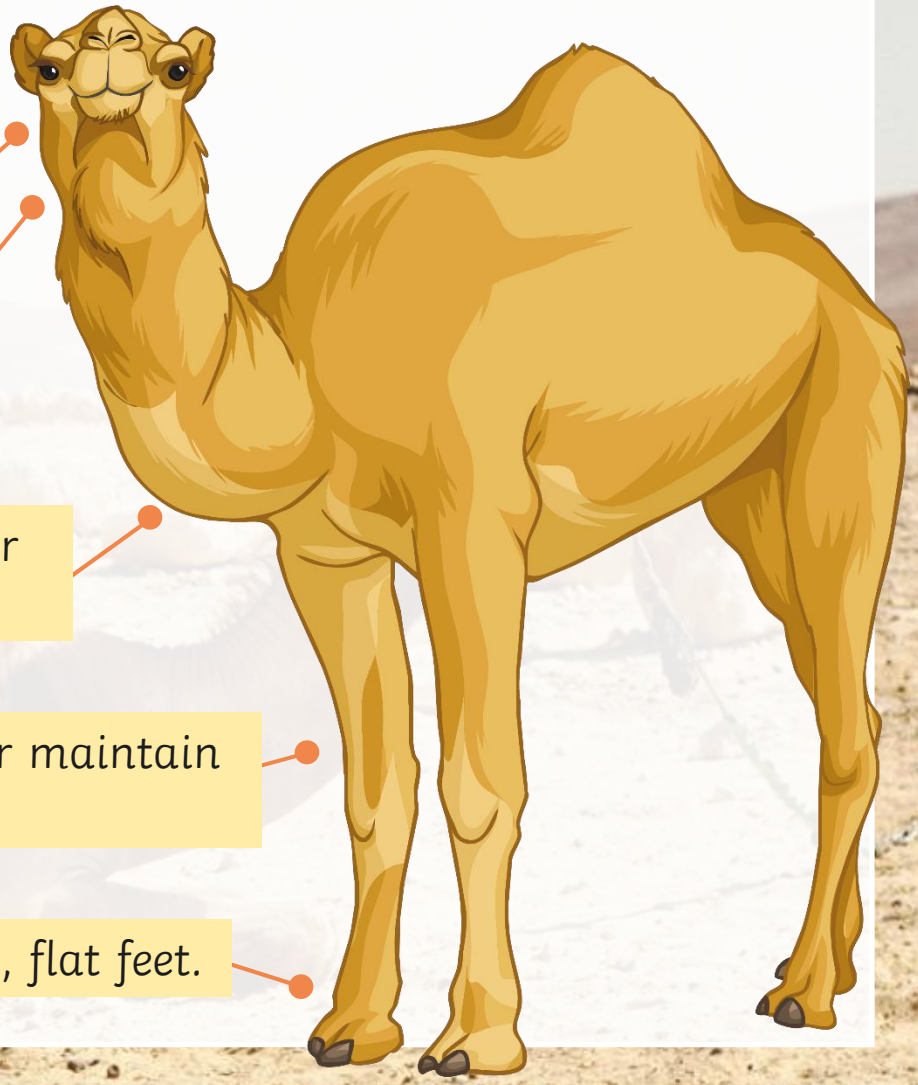
Thin, slot-like nostrils.

Can consume up to 46 litres of water in one sitting.

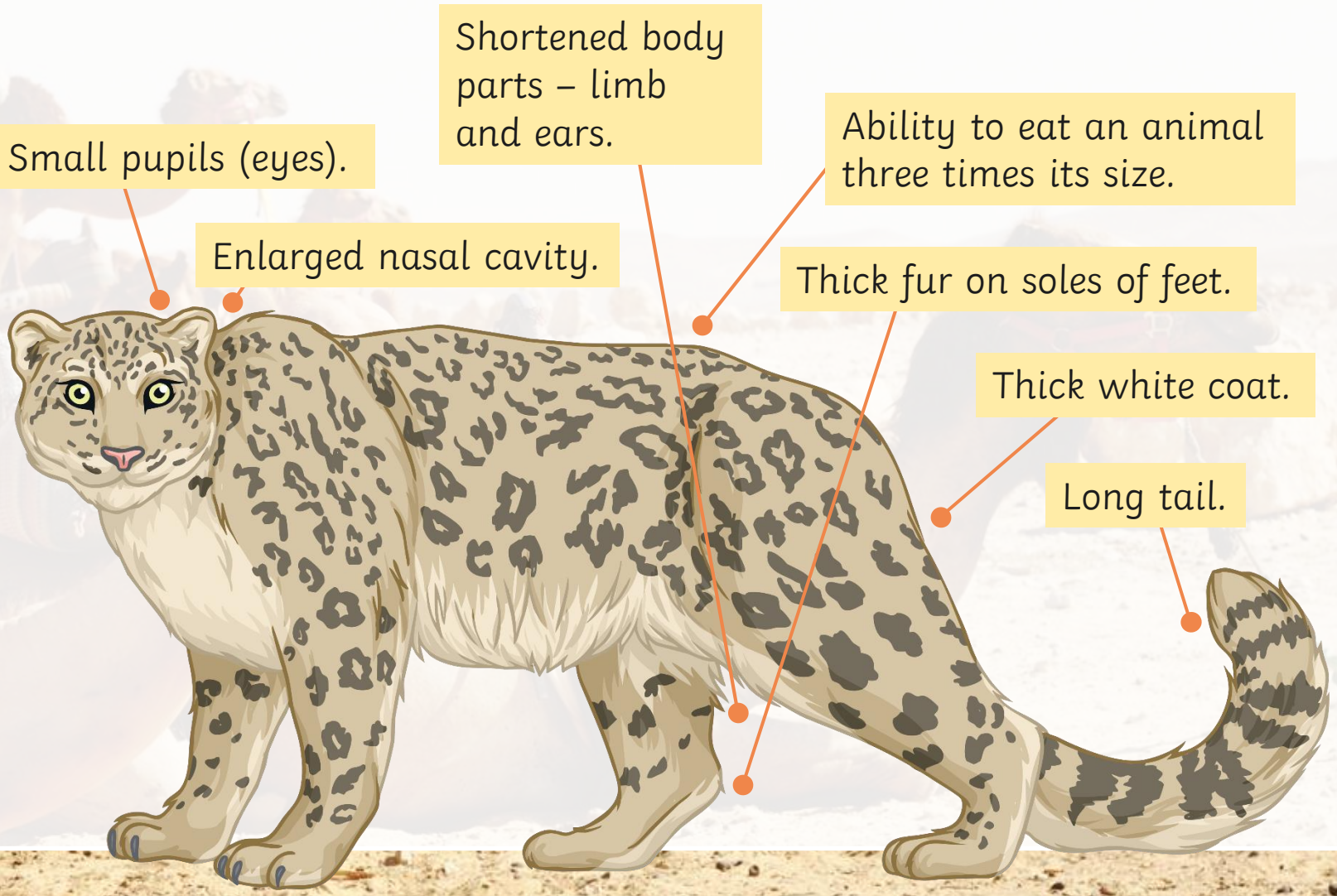
Thick fur on the top of their bodies; thin fur elsewhere.

Can run up to 40mph in a sprint, or maintain 25mph for up to an hour.

Large, flat feet.



Adaptations of a Snow Leopard



Adaptations of a Spider Monkey

Quick movements and ability to work as a team.

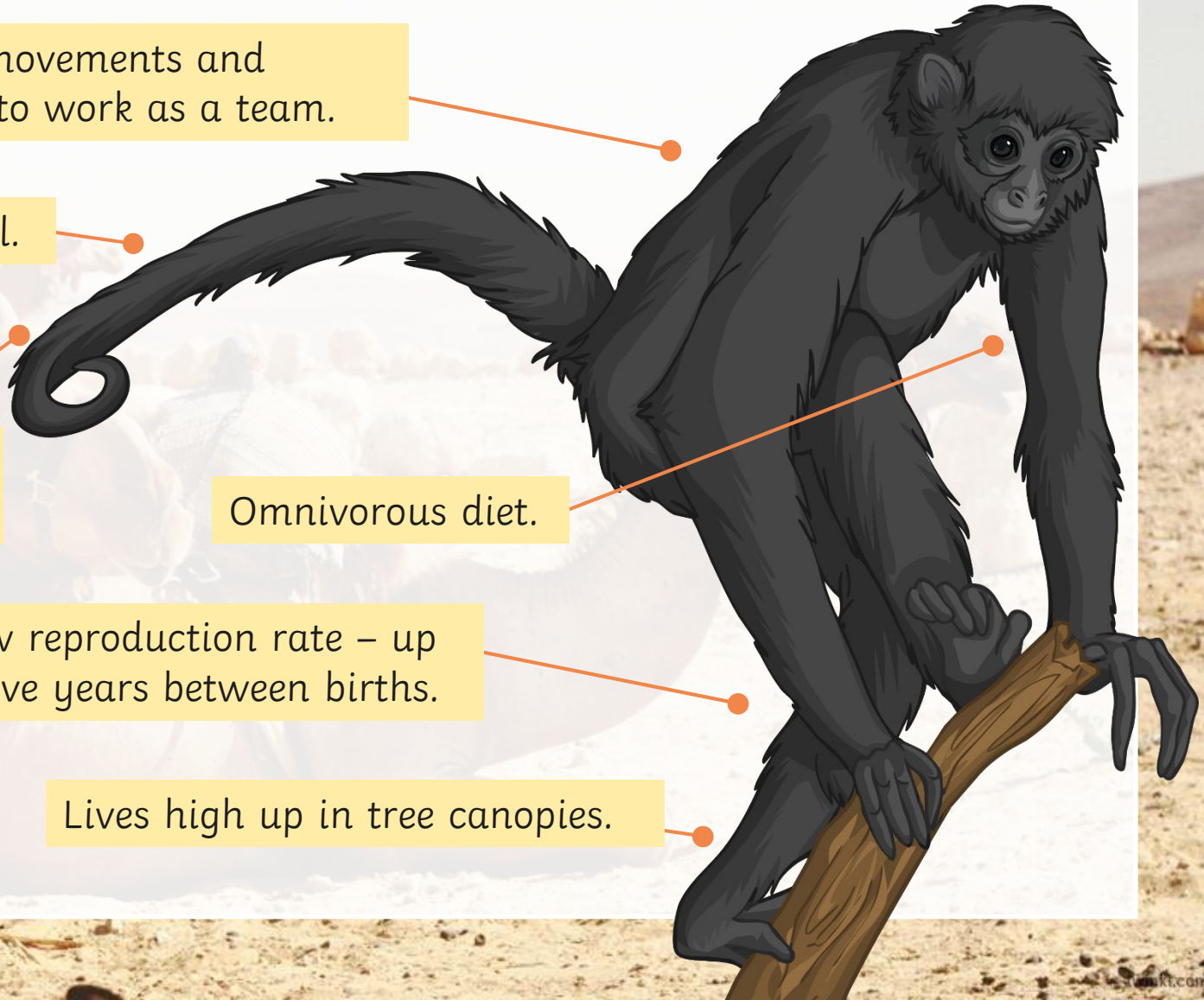
Long, strong tail.

Brown, grey or red fur.

Omnivorous diet.

Slow reproduction rate – up to five years between births.

Lives high up in tree canopies.



Adaptations of a Polar Bear

They have developed into strong swimmers.

Hollow and transparent fur.

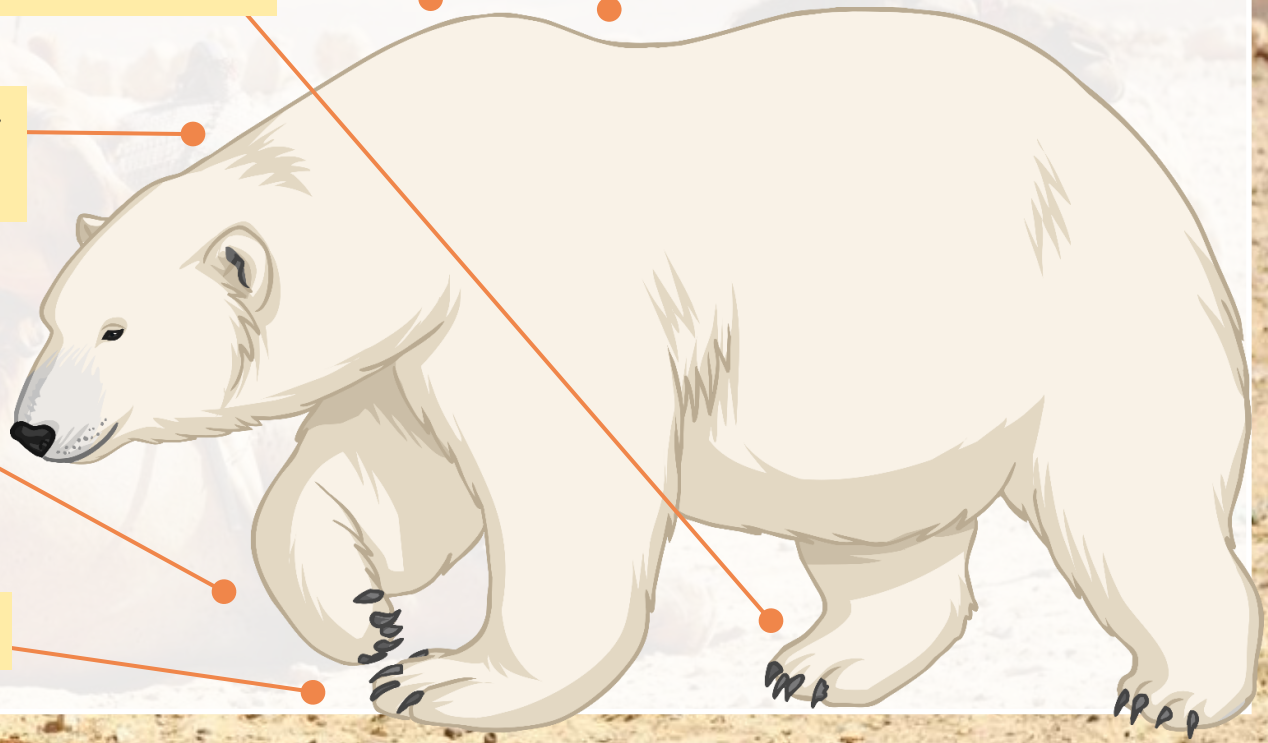
Their skin beneath their fur is black.

Long, thick, curved claws.

Thick layers of fur and body fat.

Small bumps on their footpads, called papillae.

Large paws.



Camel Adaptations

Adaptation	What's the Point?
Can run up to 40mph in a sprint, or maintain 25mph for up to an hour.	To travel quickly across the desert over long distances and to allow air to circulate underneath their stomachs to cool them down.
Can consume up to 46 litres of water in one sitting.	Water is scarce and this allows them to hydrate and replenish stored water quickly.
Three rows of eyelashes.	Protection from sandstorms/strong winds.
Large, flat feet.	Spreads weight on soft sand.
Thick fur on the top of their bodies; thin fur elsewhere.	Thick fur provides shade, thin fur aids heat loss.
Thin, slot-like nostrils.	Prevents sand from entering the body and damaging breathing.

Snow Leopard Adaptations

Adaptation	What's the Point?
Thick white coat.	To keep warm and blend in with surroundings – excellent for hiding from prey.
Thick fur on soles of feet.	Aids walking on cold ground.
Enlarged nasal cavity.	Helps breathing in high altitude.
Long tail.	Stores fat and can be coiled for warmth.
Shortened body parts – limb and ears.	Reduce potential for heat loss.
Small pupils (eyes).	Reduce glare in bright conditions.

Spider Monkey Adaptations

Adaptation	What's the Point?
Omnivorous diet.	Food is never in short supply – from birds' eggs to fruit.
Long, strong tail.	Acts as an extra limb and allows them to hang and swing in trees easily.
Brown, grey or red fur.	To blend in with surrounding trees and avoid predators.
Slow reproduction rate – up to five years between births.	This allows them to focus on their babies while they are young, protecting and educating them.
Lives high up in tree canopies.	To avoid predators. This is also where the most nutritious leaves can be found.
Quick movements and ability to work as a team.	To evade attackers.

Polar Bear Adaptations

Adaptation	What's the Point?
Hollow and transparent fur.	To reflect light and camouflage them. This is why their fur looks white in the snow.
Small bumps on their footpads, called papillae.	To help them grip to icy surfaces.
Long, thick, curved claws.	To help them to kill and eat their prey.
Large paws.	To distribute their weight evenly. This is very important when walking on ice!
Their skin beneath their fur is black.	To help them absorb heat.
Thick layers of fur and body fat.	Also to help them keep warm.

Extension Activity!

Can you suggest one more adaptation for each of the four animals we have looked at to make them even better suited to their environment?

Quiz!

Can you think of one adaptation to meet each of these conditions?

1. Very hot climate.
2. Very cold climate.
3. A lot of predators nearby.
4. Very little water nearby.
5. Little oxygen in the atmosphere.

Answers

Can you think of one adaptation to meet each of these conditions?

1. Very hot climate.

   Reflective coat, long legs (for heat loss), living underground.

2. Very cold climate.

   Thick coat, short legs, fat layers.

3. A lot of predators nearby.

   Camouflaged coat, ability to climb and move quickly.

4. Very little water nearby.

   Ability to drink/store lots of water, able to move quickly over distance.

5. Little oxygen in the atmosphere.

   Large nasal cavity and chest, amphibious.