



## KS2 Evolution and Inheritance Trail

This resource pack consists of both a teacher guide and a pupil booklet to support a trail based enquiry into the evolution and inheritance of horns in our hooved animals. When you have printed the pupil booklet pages, fold in half to make A5 booklets.

We recommend you look through the whole pack before you start, so you know what to look out for at each enclosure. The teacher guide contains additional information about key species to support your group discussions.

## Curriculum Links

### SCIENCE

#### Year 6 Evolution and Inheritance

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.



The Chevrotain or mouse deer is thought to be the most primitive of the artiodactyl ruminants (cud chewers). These tiny members of the species have fangs instead of horns!

# Whose horns?



Marwell  
Wildlife

Find each of the animals featured on the map, then use your observational skills and enclosure ID signs to identify whose horns are whose?

## KS2 Evolution and Inheritance Trail TEACHER GUIDE

The Evolution and Inheritance Trail takes you and your pupils around the zoo, focusing on the adaptations and habitat variations of our hollow horned ruminants.



### Evolution and Inheritance Trail

- |                        |                  |
|------------------------|------------------|
| 1 Roan antelope        | 7 Arabian oryx   |
| 2 Mountain bongo       | 8 Addax          |
| 3 Lesser kudu          | 9 Dorcas gazelle |
| 4 Scimitar-horned oryx | 10 Lowland Anoa  |
| 5 Blesbok              |                  |
| 6 Kirk's dik-dik       |                  |

As you go round the trail, your pupils can fill in the accompanying pupil booklet using the information from the ID signs. It is not essential for students to complete the whole trail, however, they will need to visit species 2 to 10 (located in the areas as marked) to complete the table. Please encourage your pupils to look through the whole booklet before you start, so they know what information to look for at each sign.

# Introduction



Use the 'Lemur Tree of Life' in the Giraffe House to introduce pupils to the concept of evolution using the display to demonstrate how the very different lemurs we see today evolved from a single ancestor. The reverse of this display provides information on the diet and adaptations of each species, use this information to explain that as the lemurs adapted to inhabit different areas of Madagascar the characteristics which aided their survival were inherited and passed on through their offspring, creating the huge diversity of lemurs which currently inhabit the island of Madagascar.

## Did you know?

**There are over 100 different species of lemur on the island of Madagascar many of which are under threat due to habitat loss.**

The Evolution and Inheritance Trail begins around the corner (follow giraffe look-out signs) to the Bongo house, where another display introduces the concept of horn morphology in hooved (ungulate) species. At the opposite end of the building a variety of horned skulls are displayed to demonstrate this evolutionary variation.



Mountain bongo



Scimitar-horned oryx



Arabian oryx



Addax



Dorcas gazelle



Lowland anoa

Status	Habitat	Diet
Critically Endangered	mountain forests	leaves, flowers, twigs, grasses, plants
Extinct in the Wild	dry grasslands	mainly grass some leaves
Vulnerable	desert	grasses, roots, herbs and tubers (root based nutrient stores)
Critically Endangered	desert	grass and other plants
Vulnerable	dry grasslands and desert	leaves, flowers and fruits
Endangered	tropical forest	grass, leaves, ferns and fruits

# Trail Answers

The two factors which have influenced the evolution of horned ungulates are **habitat/environment** and **diet**.

## Whose horns?

A 5 B 2 C 6 D 8 E 1 F 7 G 4 H 9 I 3 J 10

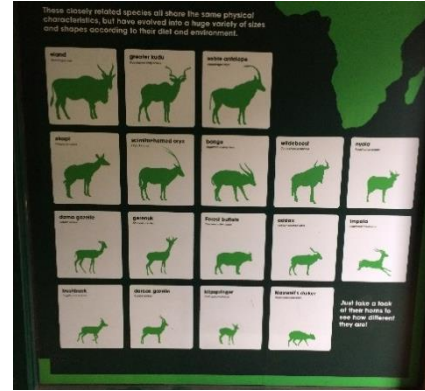
1. How might the differences in the shape and size of each species' horns have helped these animals to survive in the wild?

The differences in horns have **helped** the species survival by providing effective **defence against rivals for territory and mates, as well as their natural predators in the wild.**

2. How might having horns have increased the threats faced by these animals in the wild?

Having horns has increased the threats faced by these animals in the wild by making them a desirable target for **unsustainable hunting, especially by trophy hunters.**

# Pupil booklet activities



Starting at the Buffalo/Bongo house behind the Giraffe lookout, pupils follow the map then use the ID signs together with their observational skills to find out about horn sizes and shapes and how they differ according to the preferred habitat and diet of each species, completing their trail booklet 'Whose horns?' and 'Inheritance and survival' activities as they go.

The trail takes approximately 40 minutes to complete in its entirety, but can be shortened to just the six key species in the table if short on time.

## Did you know?

Horns are used for defending territories against others and fighting off predators, as well as for display. True horns are made of bone covered in keratin (hair), and grow in size throughout the life of the animal. Unlike deer antlers they do not regrow if broken. In some species like the nyala and sitatunga only the males have horns.

# Interesting facts

Hooved animals with horns have evolved and adapted to live in a range of habitats across the planet. In general, the species that inhabit the arid and grasslands are physically bigger and tend to have larger horns than their forest dwelling relatives, who would find these a disadvantage when pushing through dense undergrowth:-

**Mountain bongo** are the largest and heaviest forest antelope. They are both browsers and grazers, eating a variety of leaves, shoots and grasses. They sometimes get to leaves by using their horns to twist and break the branches of trees and shrubs. Their large, lyre shaped horns are positioned so that when they pick their heads up to run their horns lie flat on their necks so as not to snag in the forest undergrowth.

**Scimitar-horned oryx** are the most distinctive of our antelope with their long curved scimitar shaped horns which can grow up to 150cm in length. They have enlarged hooves that do not sink into the sand, pale coats that reflect sunlight and black skin and tip of the tongue that protects against sunburn. Most astonishingly, they can go for up to 10 months without drinking water, obtaining all they need from their food.

**Arabian oryx** have magnificent straight, ringed horns that can reach up to 68cm in length; with female horns being thinner and longer than the male. Their white coat reflects the sun and the dark legs absorb heat from the ground during cold mornings. They are able to survive for long periods without water, and can detect rainfall over long distances, which allows them to follow the infrequent rains to feed on the resultant new grasses.

**Dorcas gazelle** are the smallest gazelle. The males' horns are lyre-shaped and up to 40cm long. The females' horns are smaller and straighter. Dorcas gazelle vary what they eat according to the weather conditions. When it is very dry they mainly eat browse, especially the leaves, flowers and pods of acacia trees, because they contain lots of moisture. During the wet season they mostly eat herbaceous plants including grasses.

**Addax** are the most desert adapted antelopes, they even have extra large, spread out feet, to help walk on loose sand. Addax are easily recognisable with their corkscrew horns and distinctive white x marking across their face. In the summer their fur becomes lighter to reflect light and heat darkening to grey brown in the winter. They can sense rainfall, but may never have to drink water as they get enough moisture from the plants they eat, or dew on food for which they mainly feed overnight or at dawn.

**Blesbok** are easily identified by the white faces and legs. In the wild, they walk in single file when moving to feeding areas or watering points, creating paths as they go. Male blesbok use their V-shaped, heavily ringed horns to fight in order to establish their dominance by butting and pushing their opponents in a 'clash-fighting' duel.

**Roan antelope** are one of the larger species of antelope, second in size only to the eland. Their build is horse-like and their horns, which curve backwards, are heavily ringed at the base but relatively short for the size of the animal.