



Pathfinder Honour:

Trainer's Notes

Mammals 1



Instructions to Trainers / Instructors of this Honour

Thankyou for being involved with this Honour. These notes have been developed to assist in teaching / instructing this honour. We recognise that there is much more information available and we are grateful that you should share your expertise.

Please remember that Honours are designed to develop our Pathfinders in many ways; their interests, their knowledge and their relationship with their Saviour and Creator. Your enthusiasm and creativity will have a huge impact on those doing the honour.

To complete an Honour, the following (where applicable) must be completed satisfactorily:

- Physical and Practical Requirements.
- Honour Workbook.
- Honour Assessment Sheet. (*On SPD Honour Website but Leader's level access is required*)

Additional Reference Material

There is a huge amount of reference material in libraries, museums and on the internet.

Acknowledgements

Wikibooks: http://en.wikibooks.org/wiki/Adventist_Youth_Honors_Answer_Book/Nature/Mammals

This site provided much useful material for the updated layout of this honour, but be aware that material on any Wikibooks site is beyond the control of the SPD.

Please refer to the text of these notes for further citations.

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REQUIREMENT 1: On what day of creation were mammals created?

See Genesis 1: verses 24 to 31

REQUIREMENT 2: List four characteristics of a mammal.

1. Mammals are endothermic (warm blooded). This means that the blood is kept at a constant temperature by the body burning fuel. In hot weather, sweat pores open up to release perspiration, which cools the body.

In humans the normal mouth temperature is 36.8 degrees Centigrade. This varies through the day; too much higher, usually means you are sick

Mammals that hibernate are able to lower their body temperature to conserve energy. Arctic ground squirrels can lower their core body temperature to below freezing and not die.

2. Mammals usually have hair, fur or wool on their body. Even whales have tiny, thin hair.
3. Mammals breathe air. A sperm whale can stay submerged for half an hour at great depths, but it must come to the surface for a breath of air
4. Most mammals give birth to live offspring. The exceptions are the monotremes, the platypus and the echidna, which lay eggs into a pouch.
5. They suckle their young with milk produced by the mother. The monotremes do not have teats, but instead leak milk down hairs.

REQUIREMENT 3: Give one or more identifying characteristics of each of the following orders of mammals, and name one or more species of mammal found in each order:

a. Marsupialia (Pouched mammals)

Marsupials have a pouch that protects the young as they are developing.

The infant is born at very early stage of development and crawls out of the womb and across the mother's belly to the pouch where the baby finds a nipple that it attaches to as it continues to grow.

They are mainly found in Australia and New Guinea

Species: Kangaroo, Possum.

b. Chiroptera (Flying mammals)

This order consists of the flying mammals commonly called "bats".

Species: Fruit Bat, Ghost Bat, Vampire Bat

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c. **Carnivora (Meat eating mammals)**

Carnivora are meat eaters (ie flesh eaters), and have canine teeth that are especially adapted for this behavior. Note: Not all meat eaters are in Carnivora, eg. Whales.

They tend to have good eye sight, a good sense of smell and a well developed brain; all working together to improve their hunting ability.

Species: Lion, Dog, Domestic Cat.

d. **Rodentia (Mammals with two ever-growing incisor teeth)**

Rodents have two incisors in the upper as well as in the lower jaw which grow continuously and must be kept worn down by gnawing.

Species: Rat, Mouse

e. **Lagomorpha (Mammals with four ever-growing incisor teeth)**

They resemble rodents, but Lagomorphs differ from rodents in that:

- They have four incisors in the upper jaw (not two as in rodents)
- They will only eat vegetation (unlike rodents, who will eat meat and vegetation)
- They will redigest first-time droppings to obtain the most from their plant diet.

Species: Rabbit, Guinea Pig

f. **Artiodactyla (Mammals with even number of hoof parts. These are really their third and fourth toes.)**

These are animals with hooves of an even number of parts; for example cows with two parts to their hoof.

Species: Cow, Camel

g. **Perissodactyla (Mammals that have a single part to the hoof. This is their middle toe.)**

These are mammals that are vegetarian. They are large animals with a very large intestine needed to digest large amounts of food, usually grass.

The most important feature is their single toe or hoof used for walking.

Species: Horse, Donkey, Rhinoceroses and Tapirs.

h. **Pinnipedia (Mammals that have flippers for limbs)**

The name Pinnipedia is made of two Latin words: pinna (feather or wing) and pedis (foot). So the name literally means wing-footed. These mammals have flippers instead of legs and arms.

They breed on land, not in the water as whales do. They feed in the water and are very good swimmers.

Species: Seals, Sea Lions

i. **Sirenia (Dugongs and manatees)**

These are aquatic mammals. They are herbivores.

Species: Dugong, Manatee

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j Cetacea (Whales and dolphins)

These are aquatic mammals. They usually have a large body mass. They are carnivores.

Species: Whales, Dolphins

k Monotremata (Mammals which lay eggs)

These are the only mammals that do not have live young. They lay eggs.

They are only found in Australia.

Species: There are only two, platypus and echidna.

l. Primates (Mammals with a larger brain than other mammals)

Primates are special for the size of their brain in comparison to other mammals.

There are two main types:

Species: Lemurs and their relatives

Species: Monkeys, Apes and Humans

REQUIREMENT 4: Name a mammal from eight of the orders listed in Requirement 3 and note its order, natural habitat, what it eats and an interesting fact about it.

The number mammal species is vast. In the following notes, we have only included one species from each order. The intent is to give guidance on how this requirement should be addressed. It is recommended that those doing this honour be encouraged use their initiative in researching other species within the listed orders.

a. Order: Marsupialia (Pouched mammals)

Eastern Grey Kangaroo *Macropus giganteus*

Natural Habitat: Open forest and plains of Australia.

Food: Grasses

Interesting Fact: Highest leap recorded - 3m (10 feet).
Longest leap- 13m (42 feet).

Pictured: Eastern Grey Kangaroo *Macropus giganteus* clearly showing a Joey in the pouch or marsupium.

http://en.wikibooks.org/wiki/Image:Kangaroo_and_joey03.jpg



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b. Order: Chiroptera (Flying mammals)

Grey-Headed Flying Fox *Pteropus poliocephalus*

Natural Habitat: Tropical and sub tropical Australia

Food: Flowers and fruit

Interesting Fact: Essential for growth of forests because of their role in pollination.



Pictured: Grey-headed flying fox *Pteropus poliocephalus*.

c. Order: Carnivora (Meat eating mammals)

Wolf *Canis lupus*

Natural Habitat: They were found right across the temperate northern hemisphere, but now are only found in the tundra regions.

Food: They mainly eat sick and dying caribou but will eat mice and fruits.

Interesting Fact: A wolf can run at a speed of 60kph (35mph)



Pictured: Grey Wolf *Canis Lupus*

http://en.wikipedia.org/wiki/File:Canis_lupus_signatus_crop.jpg

d. Order: Rodentia (Mammals with two ever-growing incisor teeth)

Black Rat *Rattus rattus*

Natural Habitat: They are originally from south east Asia but are now found everywhere.

Food: Anything, including the plastic around electrical cables, causing fires.

Interesting Fact: They carried fleas which spread Bubonic Plague (the Black Death)

Pictured: Black Rat *Rattus rattus*



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e. Order: Lagomorpha (Mammals with four ever-growing incisor teeth)

Common European rabbit *Oryctolagus cuniculus*

Natural Habitat: Europe but is now found in grassy areas of countries all over the world.

Food: Vegetation

Interesting Fact: Brought to Australia as food on the First Fleet in 1788. They now cost the country billions of dollars. They have been shot, trapped, poisoned, had their burrows ripped by tractors, hunted by ferrets and been infected with two killer diseases and still they survive.

Pictured: Common European Rabbit *Oryctolagus cuniculus*

http://en.wikipedia.org/wiki/File:Wild_rabbit_in_grass.jpg



f. Order: Artiodactyla (Mammals with even number of hoof parts)

Domestic Sheep *Ovis aries*

Natural Habitat: Descended from wild sheep, they are now raised on farms for wool, meat, skins and milk.

Food: Grasses and small plants

Interesting Fact: There are about 1 billion sheep in the world.

Pictured: Domestic Sheep *Ovis aries*

http://en.wikipedia.org/wiki/File:Flock_of_sheep.jpg



g. Order: Perissodactyla (Mammals that have a single part to the hoof).

Horse *Equus ferus caballus*

Horses are swift and have a quick reaction to danger. They can sleep standing up or lying down.

Natural Habitat: Steppes of Eurasia before domestication in about 3000 BC

Food: They are grass eaters.

Interesting Fact: Horses are used to create tetanus vaccinations for humans.

Pictured: Domesticated Horse (Brazilian Paso)

http://en.wikipedia.org/wiki/File:Mangalarga_Marchador.jpg



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h. Order: Pinnipedia (Mammals that have flippers for limbs)

Southern Elephant Seal *Mirounga leonina*

Natural Habitat: On foreshores of Sub Antarctic Ocean

Food: Fish, squid and octopus.

Interesting Fact: These are massive animals. Males are 4.2 metres long and weigh up to 4 tonnes.

Pictured: Southern Elephant Seal *Mirounga leonina*
[http://en.wikipedia.org/wiki/File:Antarctic._%22The_Three_Tenors%22_\(js\)_49.jpg](http://en.wikipedia.org/wiki/File:Antarctic._%22The_Three_Tenors%22_(js)_49.jpg)



i. Order: Sirenia (Dugongs and manatees)

Dugong *Dugong dugon*

Natural Habitat: Inshore waters of South Asia & Australia

Food: Sea Grasses

Interesting Fact: It has the heaviest bones of any mammal; perhaps to act like a weight belt.

Pictured: Dugongs *Dugong dugon*
http://en.wikipedia.org/wiki/File:Dugong_Marsa_Alam.jpg



j. Order: Cetacea (Whales and dolphins)

Narwhal *Monodon monoceres*

Natural Habitat: Sea of the Arctic Circle

Food: Flatfish

Interesting Fact: Endangered by global warming

Pictured: Narwhals *Monodon monoceres*
http://en.wikipedia.org/wiki/File:Narwhals_breach.jpg



k. Order: Monotremata (Egg laying mammals)

Platypus *Ornithorhynchus anatinus*

Its mouth is located under the bill which is very sensitive and used to detect and catch prey, worms and crayfish. It hunts with its eyes closed & uses a form of electro location. It can detect minute electric fields created by muscle movement. It is able to store fat in its tail for tough times.

Natural Habitat: Australian creeks

Food: Worms, crayfish

Interesting Fact: Males have a venomous spur on hind legs.

Pictured: Platypus *Ornithorhynchus anatinus*
<http://en.wikipedia.org/wiki/File:Platypus.jpg>



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I. Order: Primates (Mammals with a larger brain than other mammals)

The Black and White Ruffed Lemur (*Varecia variegata variegata*)

It is endangered

Natural Habitat: It is only found in Madagascar.

Food: Fruit, although nectar and flowers are also favoured, followed by leaves and some seeds.

Interesting Fact: A female lemur carries her newborn in her mouth until the baby is able to cling to the fur on mother's stomach or back.

Pictured: Black and White Ruffed Lemur
http://en.wikipedia.org/wiki/File:Varecia_variegata_at_Dudley_Zoo-4.jpg



REQUIREMENT 5: Name and describe the smallest and largest mammals in the world. Discuss their sizes, habitats, how they feed, and what they eat.

Smallest mammal in the world.

The title for smallest mammal in the world depends on how 'small' is measured – size or weight. Consider the following:

Kitti's Hog-nosed Bat (*Craseonycteris thonglongyai*), also known as Bumblebee Bat

It occurs in western Thailand and southeast Burma, where it occupies limestone caves along rivers.

Kitti's Hog-nosed Bat is the smallest species of bat and one of the world's smallest mammals. It has a reddish-brown or grey coat, with a distinctive pig-like snout. Colonies range greatly in size, with an average of 100 individuals per cave.

The bat feeds during short activity periods in the evening and dawn, foraging around nearby forest areas for insects. Females give birth annually to a single offspring.

Kitti's Hog-nosed Bat is about 29–33 millimetres in length and 2 grams in mass, hence the common name of "bumblebee bat". It is the smallest species of bat and may be the world's smallest mammal, depending on how size is defined. The main competitors for the title are small shrews; in particular, the Etruscan shrew may be lighter (1.2–2.7 g) but is longer (36–53 mm head-and-body)

Source: http://en.wikipedia.org/wiki/Kitti%27s_Hog-nosed_Bat



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The Etruscan Shrew (*Suncus etruscus*), also known as the Etruscan Pygmy Shrew or the White-toothed Pygmy Shrew

This is the smallest known mammal by mass, weighing only about 2 grams, although the smallest known mammal by skull size is the Bumblebee Bat.

The smallest mature specimens of this shrew are thought to weigh about 1.3 grams and measure 36 mm long. This small mammal is 60 mm from the tip of the nose to the base of the tail; the tail is about 40 mm long. This shrew has a lifespan of 15 months. The Etruscan Shrew inhabits forests and brush areas between Southern Asia and Southern Europe. A forager, the Etruscan Shrew subsists largely upon insects.



Source: http://en.wikipedia.org/wiki/Etruscan_Shrew

Largest mammal in the world.

The largest creature in the world is a mammal and it is the Blue Whale.

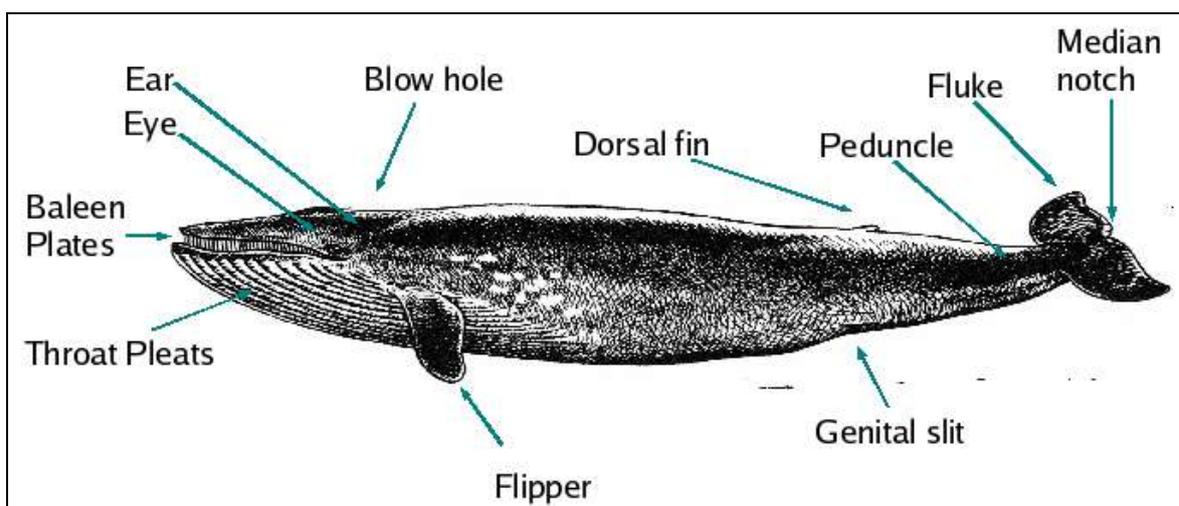
The largest reasonably reliable recording of a Blue Whale is 33.6 metres (110 feet 3 inches) long and weighing 180 tonnes. Its mouth can hold 90 tonnes of water and food and its tongue weighs 3 tonnes (about as much as 2 large cars).

Its heart is the size of a small car and weighs 600kg.

Despite its size it eats krill, which are tiny crustaceans like small shrimp.

It could not have swallowed Jonah because its throat is too small.

They are found in all the oceans.



Pictured: Blue Whale

http://en.wikibooks.org/w/index.php?title=File:Baleen_parts.png&filetimestamp=20060722221850

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REQUIREMENT 6: Give four examples of how mammals are useful to mankind or beneficial to the environment.

1. Bats eat flying insects.
2. Dogs provide assistance to the blind and comfort to the sick and lonely.
3. Cats keep down the rodent population.
4. Hyenas are scavengers and help keep the environment clean and free of disease.
5. Bears carry the nutrients of the salmon they eat into the forest. This actually completes the mineral cycle. Minerals start in the forest and are carried by the rains into the streams, then rivers, and finally into the ocean. The salmon take the minerals from the ocean environment and carry them back to the streams and rivers where they are eaten by the bears. The bears carry these minerals back to the forest when they defecate or die. If this cycle was not complete the forest would eventually not have enough of the nutrients needed to be healthy.
6. When wolves were put back into the ecosystem of Yellowstone, we learned how important one animal is in helping form a healthy ecosystem. Without wolves, the Elk could eat and drink without fear, and they had eaten most of the willow along the river. There were very few beaver left. When the wolves came back into the environment, the elk were afraid of certain areas where a wolf might hide and this allowed the willows to grow back. Now there is a growing beaver population.
7. Any others that the Pathfinder can think of. Accept all reasonable answers

REQUIREMENT 7: Give four examples of how mammals may cause problems to mankind or be destructive to the environment

1. Skunks can make a neighborhood smell quite badly.
2. Tigers, lions, bears, wolves and many other carnivorous mammals have killed and sometimes eaten people. They also prey on livestock.
3. Groundhogs, prairie dogs, gophers, moles and many other burrowing animals can create tripping hazards for humans, horses and other mammals.
4. In Australia rabbits, wild pigs and even camels, cause millions of dollars of damage each year by burrowing and spreading weeds.
5. Elephants can do quite a bit of damage to gardens and yards
6. Mice and rats can eat a large amount of grain and reproduce so rapidly that large quantities of food can disappear quite quickly.
7. Rats can carry disease such as bubonic plague.
8. Deer can carry a disease known as chronic wasting disease.
9. Beavers can back up streams and flood areas as well as cut down trees that are part of an orchard or yard.
10. Many mammals can carry rabies or distemper & pass these diseases to humans or pets.
11. Coyotes, in urban settings, can eat pets or spread garbage.
12. Deer, moose, kangaroos and other large mammals are involved in thousands of car accidents every year. Sometimes these accidents include human fatalities.
13. In New Zealand, possums which are an introduced species cost millions of dollars each year by destroying forests.

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REQUIREMENT 8: List ten species of mammals that you personally have observed and identified and note the order to which they belong. (They do not have to be wild mammals).

You may see them in the wild, visit a pet shop, or a wildlife sanctuary, or a zoo, or do a nature walk.

REQUIREMENT 9: Tell or act out a story about mammal/s (not humans) from the Scriptures. Please give the Bible reference and to what order/s the mammal/s belong/s

Following are just some of the many Bible stories involving mammals. If you think about it, there are heaps more.

Numbers 22	Balaam's donkey
2 Kings 2: 23-25	Elisha and the bears
Daniel 6	Daniel in the lion's den

FASCINATING FACTS ABOUT MAMMALS

1. A blue whale has a heart the size of a small car.
2. Arctic ground squirrels hibernate, with body core temperatures, below freezing (-2.9 degrees Celsius. 27 degrees Fahrenheit)
3. The male platypus has a venomous spur on his hind legs.
4. Weighing in at about 180 tonnes, the world's largest mammal – the blue whale, is more than 100 million times heavier than the world's smallest mammal – an Etruscan Shrew, which tips the scales at about 1.3 grams when fully grown.