

# Magnificent Mammals



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# Student Learning Objectives

**Upon viewing the video and completing the enclosed activities, students will be able to do the following:**

- List some of the characteristics that make mammals unique compared to other vertebrate groups. Some of these features include the presence of body hair and nourishment of young via mammary glands.
- Explain that mammals are endothermic, meaning they maintain a relatively constant internal body temperature.
- Understand that endothermy enables mammals to colonize “extreme” environments and to be active at different times of day.
- Describe the role of mammary glands in nourishing young.
- Explain how the musculoskeletal system enables mammals to move and carry out complex activities.
- Provide some examples of how various species of mammals use forelimbs and hind limbs differently.
- Describe the hand structures of primates focusing on the uniqueness of the opposable thumb. Briefly explain the usefulness of the opposable thumb.
- Cite some examples of highly developed senses found in specific mammals.
- Describe the characteristic of differentiated teeth exhibited by many mammals. Also, explain how differentiated teeth are beneficial to mammals.
- List the three major groups of mammals: monotremes, marsupials, and placental mammals.
- Describe some of the key characteristics of monotremes.
- Explain some of the general features of marsupials.
- List some of the key characteristics of placental mammals. Also explain the role of the placenta in nourishment of the embryo.
- Define the term gestation period.
- List examples of some of the major orders of placental mammals. Also cite examples of animals and the orders to which they belong.

# Assessment

## **Preliminary Assessment (p. 14-15):**

The Preliminary Assessment is an assessment tool designed to gain an understanding of students' preexisting knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

## **Post Assessment (p. 16-17):**

The Post Assessment can be utilized as an assessment tool following student completion of the program and student activities. The results of the Post Assessment can be compared against the results of the Preliminary Assessment to assess student progress.

## **Video Review (p. 18):**

The Video Review can be used as an assessment tool or as a student activity. There are two sections. The first part contains questions displayed during the program. The second part consists of a ten-question video assessment to be answered at the end of the video.

# Introducing the Program

Before showing the video program to your students write the word “Mammal” on the board. Ask them if they have any pets that are mammals. Some may have cats, dogs, hamsters, guinea pigs, or even horses. Write their examples on the board.

Next, ask them for examples of other mammals that live in their community. Examples might include mice, rats, rabbits, deer, raccoons, or perhaps even large mammals such as bears or moose. Write their examples on the board.

Also, ask students for examples of domesticated mammals that commonly live on farms. Some examples include pigs, goats, cows, and sheep.

Ask students the following question: “What makes a mammal a mammal?” Encourage them to consider all the animals they have listed on the board. What features do they all share? Urge them to consider their physical appearances, the way young develop and are born, and how they are structured internally. Compare the features of mammals to those of birds and reptiles. Ask how are mammals different? Tell students to pay close attention to the video to learn more about the characteristics of mammals. Following the video discuss these common mammalian features.

## Program Viewing Suggestions

The student master “Video Review” (p. 19) is provided for distribution to students. You may choose to have your students complete this master while viewing the program or do so upon its conclusion.

The program is approximately 20 minutes in length and includes a ten-question video assessment. Answers are not provided to the Video Assessment in the video, but are included in this manual on page 13. You may choose to grade student assessments as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.

# Video Script: Magnificent Mammals

1. If you have a pet dog or cat, you are familiar with one of the most diverse and fascinating groups of vertebrate animals – mammals.
2. Sea lions, monkeys, elephants, horses, and people are all examples of mammals.
3. What exactly are mammals?
4. What are some of their characteristics?
5. What are some of the different groups and types of mammals?
6. And, what makes mammals different from other groups of vertebrate animals?
7. During the next few minutes we are going to address these questions,...
8. ... and others as we explore,...
9. ... some of the fascinating features of the magnificent mammals.
- 10. Graphic Transition – Basic Mammalian Characteristics**
11. As you know, vertebrates are animals that have a backbone made up of many vertebrae.
12. There are several distinct groupings of vertebrate animals: fish, amphibians, reptiles, birds,...
13. ... and mammals. Mammals possess several characteristics that distinguish them from other vertebrate animals.
- 14. You Observe!** What covers the body of this animal?
15. Hair!
16. Mammals possess hair that covers a portion of, or their entire body.
17. Hair helps insulate the body, and enables some animals to camouflage themselves.
18. Mammals are also endothermic, meaning they maintain a relatively constant internal body temperature.
19. These deer, for example, maintain a relatively constant internal body temperature even though the external air temperature is well below freezing.
20. Endothermy enables animals, to colonize extreme environments and to be active at anytime of day.
21. Another characteristic of mammals is the presence of mammary glands. Female mammals have specialized glands called mammary glands, from which mammals derive their name.
22. Mammary glands nourish young with milk that is rich in protein, fat, and carbohydrate.
23. The milk we drink and use to cook is secreted by the mammary glands of cows.
24. Aside from a relatively small number of egg-laying mammals, most mammals give birth to living young.
25. Therefore, mammals differ from most other vertebrates that lay eggs.
26. Let's take a closer look at some other characteristics of mammals.
- 27. Graphic Transition – Mammalian Structures**
28. This white-tailed deer is capable of running at high speeds.
29. Its well-developed musculoskeletal system enables it to run, and jump gracefully.
30. The term musculoskeletal system refers to the network of muscles and skeleton working together in the body.
31. The musculoskeletal system in mammals is quite complex and well developed.

# Video Script: Magnificent Mammals

32. Mammals possess an internal skeleton or endoskeleton, that is made of bones located inside the body.
33. The skeleton is designed for great flexibility in movement via the use of multiple joints.
34. Most mammals have two sets of paired appendages.
35. Dogs and horses, for example, have four legs – 2 hind legs and 2 fore legs.
36. But, other mammals such as monkeys possess forelimbs that are used as arms.
37. In the case of marine mammals such as this sea lion, the limbs have been modified for swimming in the form of flippers.
- 38. You Compare!** Compare the shape of the human hand to that of the paw of this dog.
39. Humans possess four fingers, and an opposable thumb.
40. The dog has short digits and no thumb.
41. The structure of the human hand enables us to grasp things, play music, and manipulate objects.
42. As a group, mammals have the most well developed brains in the animal kingdom.
43. The cerebrum, the largest part of the brain, enables many mammals to carry out advanced forms of thinking and learning.
44. The brain also coordinates highly developed sensory organs.
45. While different mammals possess senses of taste, smell, sight, touch, and hearing, they vary in sensitivity.
46. Dogs, for example, possess a sense of smell that is as much as 100 times more sensitive than that of humans.
47. Rabbits have a keen sense of hearing.
48. And, bats have a specialized form of hearing that uses sonar to sense objects in the dark.
49. To maintain a constant body temperature endotherms need a great deal of energy
50. To help process large amounts of food they have a well-developed digestive system with numerous specialized organs that efficiently break down and process food.
51. Many mammals, such as elk, possess specialized teeth to help them tear grass and chew it.
52. Differentiated teeth vary in size, and shape, and are designed to accommodate an animal's dietary needs.
53. Humans, for example, possess chisel-like canines in the front of the mouth for biting, and incisors for tearing.
54. Flat, wide premolars and molars in the back of the mouth are used for grinding and chewing.
- 55. You Decide!** How are differentiated teeth helpful?
56. Differentiated teeth enable us to eat a wide variety of foods.
57. In addition to large quantities of food, mammals also require an abundant supply of oxygen.
58. To meet the oxygen demands of the body, mammals have well-developed lungs containing air sacs.
59. Gas exchange occurs through blood vessels that line air sacs.
60. A huge network of blood vessels carries oxygen and other substances throughout the body.
61. Blood is pumped through this network by a well-developed four-chamber heart.

# Video Script: Magnificent Mammals

## 62. Graphic Transition – Origin and Diversity of Mammals

63. The first mammals evolved about 200 million years ago from reptiles.
64. Fossil evidence indicates the first mammals were small creatures that resembled modern-day shrews or mice. They most likely ate insects.
65. As dinosaurs died out about 65 million years ago, mammals began to proliferate.
66. Many new species of mammals evolved, they spread out, and adapted to new habitats.
67. Mammals became the dominant class of vertebrates during the Cenozoic era, which is often referred to as the Age of Mammals.
68. Today, there are over 5,500 species of mammals on Earth.
69. These are categorized into three major groups.
70. The monotremes, thought to be the first mammals, are unusual in that they lay eggs instead of bearing live young.
71. All three living examples of monotremes live in Australia.
72. Similar to birds and reptiles the embryo is nourished by nutrients inside the egg.
73. The duck-billed platypus, the most famous monotreme, lives in burrows along waterways and is an excellent swimmer.
74. Marsupials, another group of mammals number over 250 living species. Most marsupials live in Australia or nearby islands.
75. Kangaroos and koalas are among the most familiar marsupials.
76. Opossums are common marsupials that live in North and South America.
77. Marsupial embryos develop in a shell-less egg inside the mother's body where it is nourished by the yolk.
78. Shortly after birth the tiny, hairless newborn crawls into a marsupial pouch where it nurses on mammary glands.
79. About 95% of all mammals are placed in a group called placental mammals.
80. Placental mammals are extremely diverse, and inhabit not only land, but also water.
81. Let's take a closer look at placental mammals.

## 82. Graphic Transition – Placental Mammals

83. This calf was recently born.
84. Within several hours it could stand and take its first few steps.
85. Its high level of development is not uncommon for many placental mammals.
86. This is due to the fact that placental mammals are nourished by the placenta inside the mother for a relatively long period of time.
87. The placenta is a structure that enables the exchange of vital nutrients, oxygen, carbon dioxide and wastes between the mother and the embryo.
88. The amount of time the embryo remains inside the mother's body is referred to as the gestation period.
89. These, and other features, have enabled placental mammals to become diverse and quite successful.

# Video Script: Magnificent Mammals

90. Most species of mammals belong to the group called placental mammals.
91. There are at least 19 different orders of placental mammals. Let's take a quick look at some of them.
92. The largest order of placentals is rodents, with over 2,200 species.
93. Rodents are most often plant-eaters with chisel-like front teeth. Squirrels, chipmunks, rats, beavers, and mice are examples of rodents.
94. These mammals play many important ecological roles including serving as a source of food for many other animals.
95. Rabbits, pikas, and hares are members of the order lagomorphs, which include over 65 species.
96. These mammals tend to eat leaves, grasses, and bark, and often have long hind legs adapted for jumping.
97. The order chiroptera, commonly known as bats, include over 1,100 species.
- 98. You Decide!** What makes bats unique among mammals?
99. Bats are the only mammals that can fly. They are primarily nocturnal.
100. Mammals that possess feet in the form of hooves are generally referred to as ungulates.
101. Ungulates are divided into two groups.
102. The order Artiodactyla have an even number of toes.
103. Some examples include deer, antelope, elk, bison, pigs, camels, giraffes, and cattle.
104. These animals are very important to humans, providing milk, meat, and other products.
105. Perissodactyla are ungulates that possess an odd number of toes. Horses, zebras, and rhinoceroses are some examples.
106. Ungulates tend to have flat teeth enabling them to graze on plants.
107. If you have a dog, you are familiar with mammals belonging to the order Carnivora.
108. Most of the 275 species of carnivores are meat-eaters.
109. Bears, tigers, raccoons, coyotes, wolves, and dogs are examples of carnivores that possess teeth designed for crushing and grinding their food.
110. Another order of mammals, primates, includes apes, monkeys, and humans.
111. Many species of primates live in trees.
112. Primates have well-developed brains, and an opposable thumb that enables them to grab and manipulate objects.
113. While primates are considered to be the most intelligent order of mammals,...
114. ... some aquatic mammals rival their intelligence.
115. Whales, dolphins, and porpoises are members of the order cetacea.
116. Using forelimbs modified as flippers and powerful tails, most are excellent swimmers.
117. This is just a sampling of the wide array of mammals.
- 118. Graphic Transition – Video Review**
119. During the past few minutes we have examined some of the magnificent features of mammals.

# Video Script: Magnificent Mammals

120. We began by discussing the fact that mammals have hair, feed their young with mammary glands, and are endothermic.
121. Some of the basic body structures common to most mammals were highlighted.
122. The early origins and evolution of mammals were briefly discussed.
123. Next, the major groups of mammals were outlined,
124. ...as well as some examples of mammalian orders.
125. And finally, the life cycle of the major groups of mammals were discussed.

## 126. Graphic Transition – Video Assessment

Fill in the correct word to complete the sentence.

1. The bodies of most mammals are covered with \_\_\_\_\_.
2. Mammalian young consume milk from the mother via \_\_\_\_\_ glands.
3. \_\_\_\_\_ animals have a relatively constant body temperature.
4. Many mammals contain differentiated \_\_\_\_\_ designed to meet their dietary needs.
5. Mammals evolved from \_\_\_\_\_.
6. \_\_\_\_\_ are a small group of egg-laying mammals.
7. \_\_\_\_\_ care for their young in an external pouch.
8. About 95% of all mammals are \_\_\_\_\_ mammals
9. Humans are in the order \_\_\_\_\_.
10. The \_\_\_\_\_ period is the amount of time an embryo remains in the mother before birth.



# Answer Key to Student Assessments

## Preliminary Assessment (p. 15-16)

1. c - vertebrae
2. a - endothermic
3. b - mammary glands
4. d - flippers
5. c - an opposable thumb
6. a - differentiated teeth
7. a - sense organs
8. b - dinosaurs
9. d - monotremes
10. c - marsupials
11. a - placental mammals
12. d - higher
13. c - rodents
14. d - bats
15. c - meat
16. Mammals tend to be covered with hair, most bear live young, and nourish their young with mammary glands.
17. The human hand has four fingers and an opposable thumb that is useful in manipulating objects. The flipper of a seal doesn't contain individual digits but has a web-like appearance that is useful in swimming
18. Teeth of varying shapes and sizes enable mammals to eat a wide range of foods, and enables them to successfully obtain their food.
19. Monotremes are unusual in that they lay eggs which they incubate on a nest before the young hatch.
20. The placenta is a structure that enables the exchange of vital nutrients, oxygen, carbon dioxide and waste between the mother and the embryo.

## Video Review (p. 19)

1. The animal's body is covered with hair. Mammals possess hair that covers a portion of, or their entire body.
2. Humans possess four fingers and an opposable thumb. The dog's paw has short digits and no thumb.
3. Differentiated teeth enable humans to eat a wide variety of food to meet dietary needs.
4. Bats are unique mammals because they are the only mammals that can fly. Bats are primarily nocturnal.

## Video Assessment (p. 19)

1. hair
2. mammary
3. endothermic
4. teeth
5. reptiles
6. monotremes
7. marsupials
8. placental
9. primates
10. gestation

## Post Assessment (p. 17-18)

1. a - differentiated teeth
2. d - bats
3. d - monotremes
4. c - vertebrae
5. a - placental mammals
6. b - mammary glands
7. c - marsupials
8. d - higher
9. c - meat
10. c - rodents
11. c - an opposable thumb
12. d - flippers
13. b - dinosaurs
14. a - sense organs
15. a - endothermic
16. Teeth of varying shapes and sizes enable mammals to eat a wide range of foods, and enables them to successfully obtain their food.
17. The placenta is a structure that enables the exchange of vital nutrients, oxygen, carbon dioxide and waste between the mother and the embryo.
18. The human hand has four fingers and an opposable thumb that is useful in manipulating objects. The flipper of a seal doesn't contain individual digits but has a web-like appearance that is useful in swimming.
19. Mammals tend to be covered with hair, most bear live young, and nourish their young with mammary glands.
20. Monotremes are unusual in that they lay eggs which they incubate on a nest before the young hatch.

## Magnificent Mammals Vocabulary

1. e - endothermic
2. h - mammary glands
3. o - musculoskeletal system
4. k - differentiated teeth
5. a - monotremes
6. n - duck-billed platypus
7. d - marsupials
8. m - opossum
9. f - placenta
10. l - placental mammal
11. i - gestation period
12. g - lagomorphs
13. b - rodents
14. j - ungulates
15. c - carnivores

# Answer Key to Student Activities




## What are Placental Mammals? (p. 21)

- The horse is covered with hair - commonly called fur. Hair helps insulate the body. It also helps some animals camouflage themselves.
- Horses can function quite well in cold weather due to the fact they are endotherms. The thick coat of fur and high metabolic rate helps them tolerate very cold temperatures. Horses are endothermic.
- Horses, like many mammals, possess differentiated teeth that come in various shapes and sizes.
- Horses, like other placental mammals, give birth to live, highly developed young. A newborn horse is quickly able to stand and walk. It is nourished by milk from its mother's mammary glands.
- Horses are similar to humans in that they are endothermic vertebrate mammals. Some of the differences include the fact that horses are completely covered with hair, walk on four legs, lack hands, and do not possess as well-developed brain as in humans.

## Comparing Mammals, Birds, and Reptiles (p. 22)

	Mammal	Bird	Reptile
Body covering	hair	feathers	scales
Feeding of young	via mammary glands	food brought to young by parent(s)	very little if any
Birth and development of young	bear live young	young hatched from incubated eggs	young hatch from eggs
Endothermic or Ectothermic	endothermic	endothermic	ectothermic
Heart	4-chambered	4-chambered	4-chambered
Examples	student answers will vary	student answers will vary	student answers will vary
Number of species	over 5,500	over 9,000	about 7,000
Mode of transport	Most walk on four legs; bats can fly; sea mammals can swim	most are capable of flying	most walk or slither; some can swim

## Mammal Diversity (p. 23)

Mammalian Group	sketch of an example	List of Examples	Geographic Location	Development of Young
Monotremes		duck-billed platypus	Australia and near islands	Lay eggs that are incubated
Marsupials		kangaroos, koalas, and opossums	Throughout the world with koalas and kangaroos limited to Australia	Young develop in a shell-less egg inside the mother, are born, and then nourished in a pouch
Placental Mammals		lions, bears, cats, and seals	Throughout the world on land, air, and water	Highly developed young born live

## Major Orders of Placental Mammals (p. 24-25)

- a. Lagomorpha b. about 69 c. hares, rabbits, and pika d. located throughout the world. e. four upper incisors, rear legs larger than front legs.
- a. Artiodactyla b. over 200 c. deer, cattle, giraffes, and bison d. located throughout the world. e. hoofed animals with two or four toes; mostly eat plants.
- a. Perissodactyla b. about 20 c. zebras, rhinoceroses, and horses d. located throughout the world. e. hoofed animals with one or three toes; usually are herbivores.
- a. Rodentia b. over 2,000 c. mice, rats, beavers, and porcupines d. located throughout the world e. incisor teeth that are chisel-like; are mostly herbivores.
- a. Carnivora b. over 200 c. wolves, cats, dogs, bears, and raccoons. d. located throughout the world e. teeth for eating meat
- a. Edentata b. over 30 c. sloths, anteaters, and armadillos d. located throughout the world e. some have peglike teeth, but most are toothless; mainly eat insects.
- a. Primates b. over 230 c. monkeys, apes, lemurs, and humans d. located throughout the world e. opposable thumb, brain size is large
- Student answers will vary.

# Preliminary Assessment

Name: \_\_\_\_\_

**Directions:** Circle the best answer for each of the following:

- The backbones of vertebrate animals are made up of many small bones called:
  - femurs
  - nodules
  - vertebrae
  - teeth
- Mammals are described as the following because they maintain a relatively constant core body temperature:
  - endothermic
  - ectothermic
  - cold-blooded
  - poikilothermic
- Female mammals nourish their newborn young with specialized glands called:
  - pituitary glands
  - mammary glands
  - thyroid glands
  - salivary glands
- In the case of many marine mammals, limbs have been modified in what form?
  - hands
  - ears
  - fingers
  - flippers
- The primate hand (including humans) is unique in that it has the following structure:
  - nails
  - hair
  - an opposable thumb
  - several fingers
- Many mammals possess teeth of varying sizes and shapes to accommodate their dietary needs. Such teeth are referred to as:
  - differentiated teeth
  - molars
  - homogeneous teeth
  - incisors
- The ears of a rabbit, the nose of a dog, and the eyes of a lion are examples of:
  - sense organs
  - digestive gases
  - excretory organs
  - respiratory organs
- Mammals began to proliferate following the extinction of what major group of animals?
  - fish
  - dinosaurs
  - worms
  - amphibians
- What group of mammals lay eggs instead of bearing live young?
  - placental mammals
  - marsupials
  - mastodons
  - monotremes
- Kangaroos, opossums, and koalas are examples of the following group of mammals:
  - monotremes
  - ectothermic
  - marsupials
  - placental mammals
- About 95% of all mammals are placed in the following group:
  - placental mammals
  - marsupials
  - aves
  - monotremes
- The level of development of newborn placental mammals compared to other vertebrates such as fish and amphibians is:
  - lower
  - the same
  - indifferent
  - higher
- Squirrels, chipmunks, rats, and mice are members of the largest order of placental mammals. What is this order?
  - lagomorphs
  - primates
  - rodents
  - carnivores
- The order Chiroptera includes over 1,100 known species, and includes the only mammals that can fly. What is the common name for these animals?
  - ungulates
  - lagomorphs
  - birds
  - bats
- Most of the approximately 275 species of carnivores include the following food in their diet:
  - grass
  - trees
  - meat
  - grain



# Post Assessment

Name: \_\_\_\_\_

**Directions:** Circle the best answer for each of the following:

- Many mammals possess teeth of varying sizes and shapes to accommodate their dietary needs. Such teeth are referred to as:
  - differentiated teeth
  - molars
  - homogeneous teeth
  - incisors
- The order Chiroptera includes over 1,100 known species, and includes the only mammals that can fly. What is the common name for these animals?
  - ungulates
  - lagomorphs
  - birds
  - bats
- What group of mammals lay eggs instead of bearing live young?
  - placental mammals
  - marsupials
  - mastodons
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- The backbones of vertebrate animals are made up of many small bones called:
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  - nodules
  - vertebrae
  - teeth
- About 95% of all mammals are placed in the following group:
  - placental mammals
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  - monotremes
- Female mammals nourish their newborn young with specialized glands called:
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  - mammary glands
  - thyroid glands
  - salivary glands
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  - ectothermic
  - marsupials
  - placental mammals
- The level of development of newborn placental mammals compared to other vertebrates such as fish and amphibians is:
  - lower
  - the same
  - indifferent
  - higher
- Most of the approximately 275 species of carnivores include the following food in their diet:
  - grass
  - trees
  - meat
  - grain
- Squirrels, chipmunks, rats, and mice are members of the largest order of placental mammals. What is this order?
  - lagomorphs
  - primates
  - rodents
  - carnivores
- The primate hand (including humans) is unique in that it has the following structure:
  - nails
  - hair
  - an opposable thumb
  - several fingers
- In the case of many marine mammals, limbs have been modified in what form?
  - hands
  - ears
  - fingers
  - flippers
- Mammals began to proliferate following the extinction of what major group of animals?
  - fish
  - dinosaurs
  - worms
  - amphibians
- The ears of a rabbit, the nose of a dog, and the eyes of a lion are examples of:
  - sense organs
  - digestive gases
  - excretory organs
  - respiratory organs
- Mammals are described as the following because they maintain a relatively constant core body temperature:
  - endothermic
  - ectothermic
  - cold-blooded
  - poilothermic



# Video Review

Name: \_\_\_\_\_

**Directions:** Answer these questions as you watch the video:

**1. You Observe!**

What covers the body of this animal?

**2. You Compare!**

Compare the shape of the human hand to that of the paw of this dog.

**3. You Decide!**

How are differentiated teeth helpful?

**4. You Decide!**

What makes bats unique among mammals?

## Video Assessment

**Directions:** After you watch the video, fill in the blank to complete the sentence.

1. The bodies of most mammals are covered with \_\_\_\_\_.
2. Mammalian young consume milk from the mother via \_\_\_\_\_ glands.
3. \_\_\_\_\_ animals have a relatively constant body temperature.
4. Many mammals contain differentiated \_\_\_\_\_ designed to meet their dietary needs.
5. Mammals evolved from \_\_\_\_\_.
6. \_\_\_\_\_ are a small group of egg-laying mammals.
7. \_\_\_\_\_ care for their young in an external pouch.
8. About 95% of all mammals are \_\_\_\_\_ mammals.
9. Humans are in the order \_\_\_\_\_.
10. The \_\_\_\_\_ period is the amount of time an embryo remains in the mother before birth.

# Magnificent Mammals Vocabulary

Name: \_\_\_\_\_

**Directions:** Unscramble the vocabulary words in the first column. Match the words to the definitions in the second column.

- |                                       |  |
|---------------------------------------|--|
| _____ 1) ceinmdroeth _____            | a. A group of mammals that lay eggs instead of bearing live young.   |
| _____ 2) aarmmym lngsda _____         | b. The largest order of mammals with over 2,200 species.   |
| _____ 3) csamllukleusoet yetsms _____ | c. A group of mammals with most eating meat; examples include bears, tigers, and wolves.   |
| _____ 4) nfftdtereiaed ehtte _____    | d. A group of mammals in which the newborn nurses on mammary glands inside a pouch.  |
| _____ 5) oormsnemet _____             | e. The ability of an organism to maintain a relatively constant core body temperature.   |
| _____ 6) cdku-ildlbe pastupyl _____   | f. Structure that enables the exchange of vital nutrients, oxygen, carbon dioxide, and wastes between the mother and the embryo. |
| _____ 7) ulmsasapri _____             | g. A group of mammals that includes rabbits, pikas, and hares.   |
| _____ 8) sopsmou _____                | h. Structures possessed by female mammals enabling them to nourish young with milk.  |
| _____ 9) caelpatn _____               | i. The amount of time an embryo develops inside the mother.  |
| _____ 10) anlcaeltp mlmaam _____      | j. Mammals that possess feet in the form of hooves.  |
| _____ 11) agitstneo rdieop _____      | k. Teeth varying in size and shape designed to accommodate an animal's dietary needs.  |
| _____ 12) rghoplasm _____             | l. A group of mammals nourished by the placenta inside the mother.   |
| _____ 13) eosdtrn _____               | m. Example of a marsupial that lives in North and South America.   |
| _____ 14) gtlusuean _____             | n. An example of a monotreme that lives in burrows along waterways in Australia.   |
| _____ 15) isvaercnor _____            | o. The network of muscles and bones working together in the body.  |

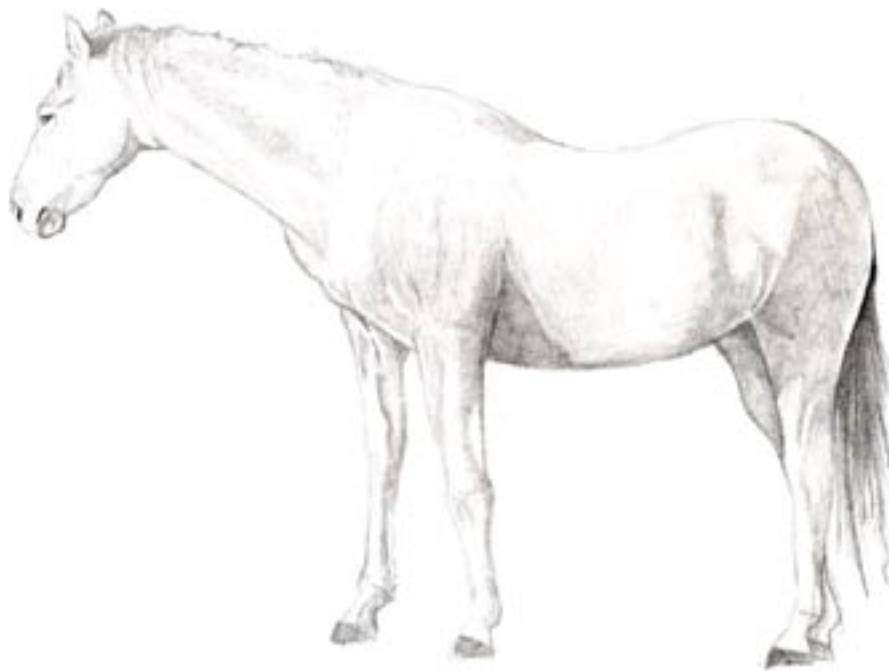
# What are Placental Mammals?

Name: \_\_\_\_\_

## Background:

If you have a pet dog or cat, you are familiar with one of the most diverse and fascinating groups of vertebrate animals - mammals. Horses, tigers, lions, whales, and people are all examples of mammals. Most specifically, they are placental mammals. What exactly are placental mammals? What are some of their characteristics? And, what are some different examples of placental mammals? In this activity you will work on answering these questions.

**Directions:** Below is an illustration of a specific type of placental mammal - a horse. It is representative of placental mammals. Placental mammals make up about 95% of all mammals. Answer the questions below about the horse, keeping in mind that its characteristics are similar to many placental mammals.



## Questions:

1. Describe the body covering of the horse. How does this help the horse?
2. Can horses survive cold temperatures? What enables them to do so? Are they ectothermic or endothermic?
3. Describe their teeth. Are they all the same or are they different from each other?
4. How does the horse give birth? Describe a newborn horse. How does a female horse nourish it? What structures enable it to nourish its young?
5. How is a horse similar and different from humans?

# Comparing Mammals, Birds, and Reptiles

Name: \_\_\_\_\_

## Background:

As you know, vertebrates are animals that have a backbone made of many vertebrae. There are several distinct groups of vertebrate animals that vary widely from each other. These five groupings include fish, amphibians, reptiles, birds, and mammals. Each of these groups of vertebrates possess several common characteristics that distinguish them from other vertebrates. In this activity you will compare the main characteristics of several vertebrate groups.



## Directions:

Using your knowledge of vertebrate animals, textbooks, and other reference materials, compare the main characteristics of mammals, birds, and reptiles. Record the characteristics in the spaces provided.

	Mammal	Bird	Reptile
Body covering			
Feeding of young			
Birth and development of young			
Endothermic or Ectothermic			
Heart			
Examples			
Number of species			
Mode of transport			

# Mammal Diversity

## Background:

Today, there are over 5,500 species of mammals on Earth. These are categorized into three major groups. The monotremes, thought to be the first mammals, are unusual in that they lay eggs instead of bearing live young. All three living examples of monotremes live in or near Australia. Similar to birds and reptiles the embryo is nourished by nutrients inside the egg. The duck-billed platypus, the most famous monotreme, lives in burrows along waterways and is an excellent swimmer. Marsupials, another group of mammals number

marsupials live in Australia or nearby islands. Kangaroos and koalas are among the most familiar marsupials. Opossums are common marsupials that live in North and South America. Marsupial embryos develop in a shell-less egg inside the mother's body where it is nourished by the yolk. Shortly after birth the tiny, hairless newborn crawls into a marsupial pouch where it nurses on mammary glands. About 95% of all mammals are placed in a group called placental mammals. Placental mammals are extremely diverse, and inhabit not only land, but also water.

## Directions:

In this activity you will describe some of the distinguishing features of the three major groups of mammals: monotremes, marsupials, and placental mammals. Using the information provided in the background, other reference materials, and your knowledge about mammals, complete the chart.

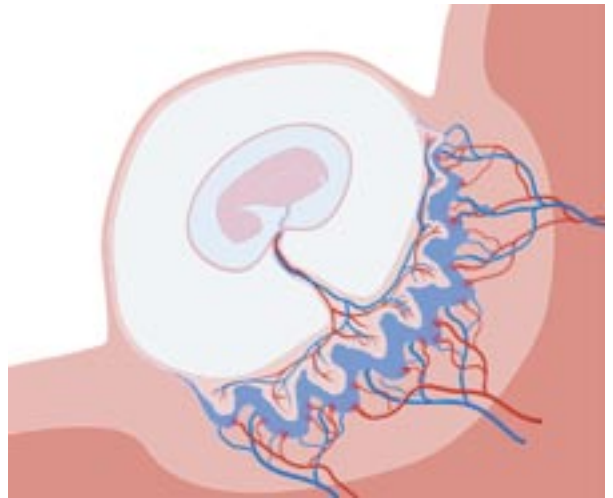
Mammalian Group	Sketch of an example	List of Examples	Geographic Location	Development of Young
Monotremes				
Marsupials				
Placental Mammals				

# Major Orders of Placental Mammals

Name: \_\_\_\_\_

## Background:

Today there are over 5,500 species of mammals on Earth. Many, many more species of mammals are extinct. About 95% of all mammals are placed in a group called placental mammals. Placental mammals are nourished by the placenta inside the mother for a relatively long period of time. The placenta is a structure that enables the exchange of vital nutrients, oxygen, carbon dioxide and wastes between the mother and the embryo. These and other features have enabled placental mammals to become diverse and quite successful.



## Activity:

In this activity you will become familiar with some of the major orders of placental mammals. Below is a chart listing seven of the major mammalian orders. Using your knowledge of mammals and other reference materials, complete the information on the chart. For the eighth order choose an order that is not listed, sketch an example and complete the information on the chart. After completing the chart, each member of the class will be assigned one order. One at a time they will state the characteristics of their assigned order. The rest of the class will try to figure out the order they are describing.

1.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

2.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

# Major Orders of Placental Mammals

Name: \_\_\_\_\_

3.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

4.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

5.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

6.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

7.



- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics:

8.

- a. Name of Group:
- b. Number of Species:
- c. Examples:
- d. Geographic Location:
- e. Physical Characteristics: