Learning About Mammals

The **mammals** (Class Mammalia) includes everything from mice to elephants, bats to whales and, of course, man. The amazing diversity of mammals is what has allowed them to live in any habitat from desert to arctic to the deep ocean. They live in trees, they live on the ground, they live underground, and in caves. Some are active during the day (***diurnal***), while some are active at night (***nocturnal***) and some are just active at dawn and dusk (***crepuscular***). They live alone (***solitary***) or in great herds (***gregarious***). They mate for life (***monogamous***) or form harems (***polygamous***). They eat meat (***carnivores***), they eat plants (***herbivores***) and they eat both (***omnivores***). They fill every niche imaginable.

Mammals come in all shapes and sizes from the tiny pygmy shrew, weighing 1/10 of an ounce (2.8 grams), to the blue whale, weighing more than 300,000 pounds! They have a huge variation in life span from a small rodent living one year to an elephant living 70 years. Generally, the bigger the mammal, the longer the life span, except for bats, which are as small as rodents, but can live for up to 20 years.

Though huge variation exists in mammals, there are a few physical traits that unite them.
1) Mammals are **covered with body hair** (fur). Though marine mammals, like dolphins and whales, have traded the benefits of body hair for better aerodynamics for traveling in water, they do still have some bristly hair on their faces (and *embryonically* - before birth). Hair is important for keeping mammals warm in cold climates, protecting them from sunburn and scratches, and used to warn off others, like when a dog raises the hair on its neck. Sometimes hair is adapted as a protective tool like the spines on a porcupine or the shield on an armadillo or pangolin. Hairs can be used to feel for things, like the whiskers on a cat or sea lion or act as camouflage to blend into the mammal's habitat.

2) Mammals have **3 middle ear bones** called the malleus (hammer), incus (anvil), and stapes (stirrup). They greatly improve a mammal's hearing, which allows a better ability to communicate. Specifically, when sound waves hit the eardrum, these small bones transmit the vibrations from the eardrum (tympanic membrane) to the inner ear.

3) Female mammals have **mammary glands that produce milk to feed their young**. The milk is full of fat and protein that helps young grow and develop, giving them a good start toward surviving to adulthood. They also bear live babies (not in eggs) - with the exception of the platypus.

4) Mothers (and sometimes fathers) will protect young from predators and often live with them even after they are finished nursing to allow them to learn how to hunt, survive predation or be in a social group. (This is not unique to mammals, as most birds and even some reptiles do this, but all mammals do this.)

Some Other Traits of Mammals:

- Wild mammals are hard to catch sight of because most are ***nocturnal***. Some diurnal (active during the day) species include chipmunks and squirrels. (Wild mammals should never be approached because they can carry rabies, especially fox, skunks, bats and raccoons.)

- Mammals have a backbone (vertebrae) with great leg mobility, making them an agile group of animals.

- Mammals have specialized teeth with some for cutting, some for grabbing and tearing and some for crushing and grinding.

- In the eastern United States there are less than 100 species of mammals from all different orders. Here are a few of the orders of mammals found in the U.S. See if you can see the similarities between animals of the same order.

Some Orders of Mammals:

Order **Artiodactyla** (even-toed ungulates: antelope, deer, camels, wild pigs, wild cows, mt. sheep, hippos, etc.)

Order **Carnivora** (canines (coyotes, foxes, wolves), cats (bobcats, lynx, mountain lion) tigers, lions, bears (black bears, panda, polar bear, grizzly, etc.), weasels, minks, otters and pinnipeds (seals and sea lions), etc.)

Order **Cetacea** (whales, dolphins)

Order **Chiroptera** (bats)

Order **Insectivora** (insect-eaters: hedgehogs, moles, shrews)

Order **Lagomorpha** (rabbits, hares, pikas)

Order **Perissodactyla** (odd-toed ungulates: horses, rhinos, tapirs)

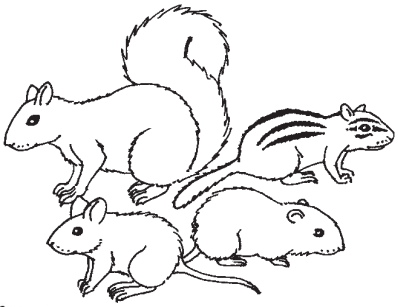
Order **Primates** (apes, monkeys, lemurs, people)

Order **Rodentia** (rodents: rats, mice, squirrels, chipmunks, beaver, gerbils, hamsters, etc.)

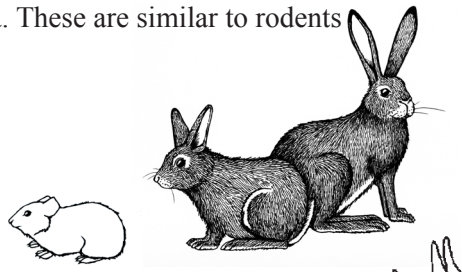
Mammal Taxonomy

Mammal Orders:

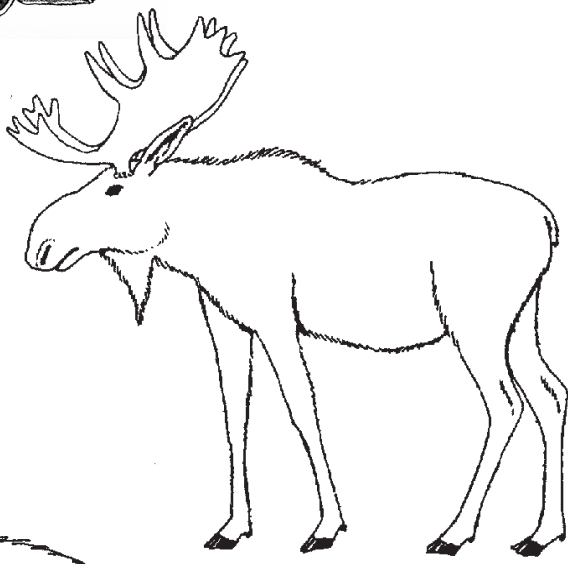
• **Rodentia** - includes mice, voles, squirrels, chipmunks, woodchucks, and beavers. They have two gnawing teeth on top and on bottom and vary in size from the chipmunk to the largest rodent in North America, the beaver.



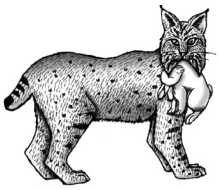
• **Lagomorpha** - includes rabbits, hares and pika. These are similar to rodents but have four upper gnawing teeth.

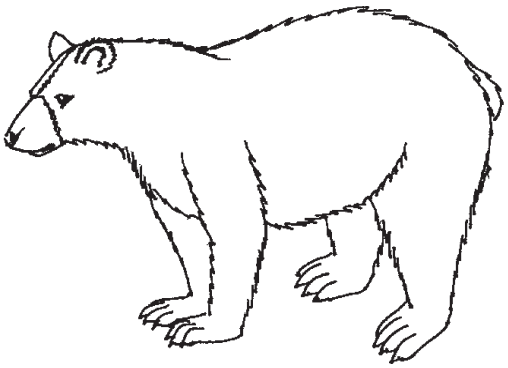


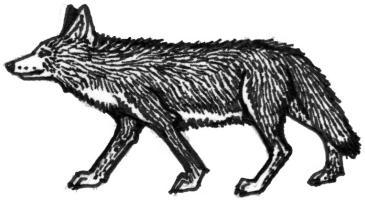
• **Artiodactyla -** includes hooved mammals like moose and deer. They have exceptionally long, thin legs and split-hooved feet.



• **Carnivora** - includes dogs, bears, raccoons, weasels, and cats. Their shapes vary greatly by family.







• **Insectivora** - includes shrews and moles. Relatively small, with long, pointed faces, small eyes and ears, and varying tail lengths.

Major Orders of Mammals:

Subclass Eutheria (Placental mammals)

Order Artiodactyla (even-toed ungulates: antelope, **deer**, camels, wild pigs, wild cows, mt. sheep, hippos, etc.)

Order Carnivora (**canines (coyotes, foxes, wolves), cats (bobcats, lynx, mountain lion)** tigers, lions, **bears** (**black bears**, panda, polar bear, grizzly, etc.), **weasels**, **minks, otters** and pinnipeds (**seals** and sea lions), etc.)

Order Cetacea (**whales, dolphins**)

Order Chiroptera (**bats**)

Order Insectivora (insect-eaters: hedgehogs, **moles, shrews**)

Order Lagomorpha (**rabbits, hares, pikas**)

Order Macroscelidea (elephant shrews)

Order Perissodactyla (odd-toed ungulates: **horses**, rhinos, tapirs)

Order Pholidota (the pangolin)

Order Primates (apes, monkeys, lemurs, **people**)

Order Proboscidea (elephants, mammoths, mastodons, etc.)

Order Rodentia (rodents: **rats, mice, squirrels, chipmunks, beaver,** gerbils, hamsters, etc.)

Order Sirenia (sea cows, **manatees**)

Order Tubulidentata (aardvarks)

Order Edentata [also called Xenarthra] (sloths, armadillos)

Order Hyracoidea (hyraxes)

Subclass Metatheria (marsupials, about 270 species, young are born in an immature state, most females have pouches)

Order Didelphimorphia - **opossums**

Order Paucituberculata - shrew-like insectivores

Order Dasyuromorphia - numbat, extinct Tasmanian wolf

Order Peramelemorphia - bandicoots and bilbies

Order Notoryctemorphia - marsupial moles

Order Diprotodontia - (10 families and 117 species) kangaroos, wallaby, wombats, koalas

Subclass Prototheria

Order Monotremata (2 families that lay eggs and feed milk: Family Ornithorhynchidae, duck-billed platypus and Family Tachyglossidae, spiny anteaters)

Looking at Rodent Taxonomy:

In this example, the chipmunk, deer mouse, and squirrel are all in the order **Rodentia**. Look at the similarities in their form. Now look at their differences. Drawing animals makes you really study how their bodies are put together and how they are related. Rodents all have large front teeth (incisors) for chewing. They have a body structure suited for sitting back on their hind legs and handling food with their front feet. Think about how different that is from a carnivore like a coyote. This shows you some of the real differences between animal groups. Drawing animals helps illustrate their taxonomic differences.

Kingdom - Animal
Phylum - Vertebrate
Class - Mammal
Order - Rodentia
Family - Chipmunk
Genus - Tamias
Species - striatus

Looking at Rodents:

The taxonomy of an eastern chipmunk would look like this:

Kingdom	-	Animal
Phylum	-	Vertebrate
Class	-	Mammal
Order	-	Rodentia
Family	-	Chipmunk
Genus	-	*Tamias*
Species	-	*striatus*

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