

# Mammal Study Merit Badge

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Scouts BSA





- Safety
  - Follow your family's rules for going online
  - Protect your privacy
  - Do not open emails or files from people you do not know or trust
  - If you receive/discover information that makes you uncomfortable, leave it and tell your parents
  - Do not believe everything you see or read online
  - NEVER agree to get together with someone you "meet" online
  - NEVER give personal information like email, phone number, address
  - NEVER share your Internet passwords with anyone
  - NEVER shop online unless you have your parent's permission to do so
  - Be a good online citizen

# Requirement 1

## ➤ Animal

- Anything that can move on its own power and a few creatures that can't (the sponge). Includes insects, birds, fish, amphibians, reptiles, shellfish, worms, mammals.
- Can not make their own food like plants can with photosynthesis
- Do not have cellulose cell walls

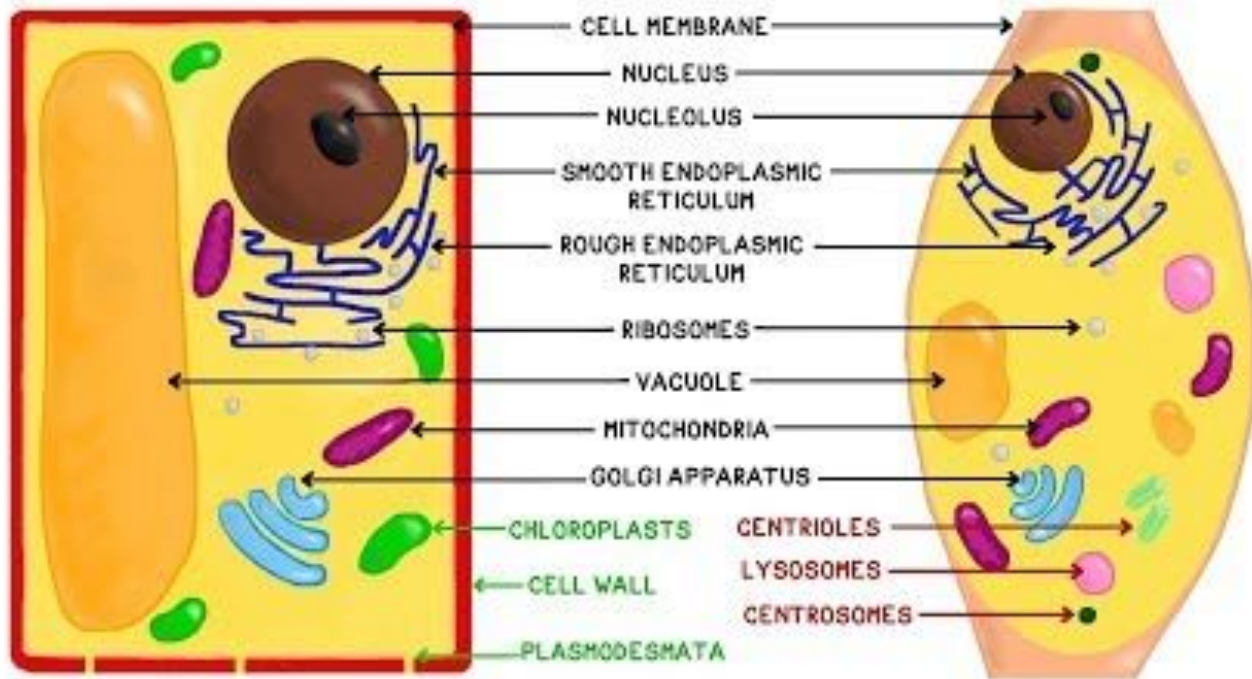
## ➤ Invertebrate

- Do not have a backbone (spine)

## ➤ Vertebrate

- Have a backbone (spine)
- May be cartilage with a central rod (notochord): shark. Or may be made of segmented bones (vertebrae): humans
- Bilateral symmetry
- Hollow nervous system
- Sexual reproduction predominantly

# PLANT VS. ANIMAL CELLS



# Invertebrates



## Invertebrates



# Vertebrates



# Requirement 1

## ➤ Mammal

- Produces milk for their young
- Viviparous: placental mammals
  - Exceptions: Monotremes - platypus, echidnas: lay eggs. Marsupials - kangaroos, wallabies, koalas, possums - pouch gestation
- Have hair/fur/quills
- Warm blooded
- Sweat glands
- Four limbs
- Four chambered heart
- Larger brain, higher IQ, in general
- Fewer skull bones





# Requirement 1

## ➤ Mammal

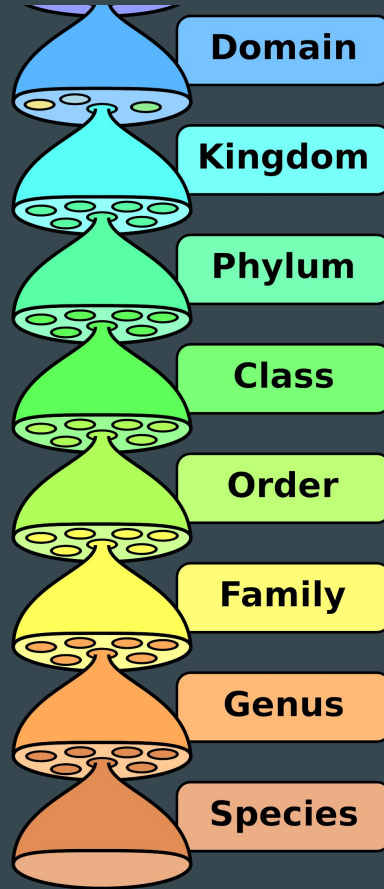
- Single bone on each side of the lower jaw: dentary bones are the only ones in which the teeth are anchored. Hinged directly to the skull.
- Three bones (ossicles) in their inner ear that transmit sounds: Malleus, Incus, Stapes
- Heterodont: different teeth that are specialized. Canines vs Molars vs Front teeth
- Diaphragm. Separates chest from the abdomen
- Seven vertebrae in the neck (some exceptions)
- 5400 species distributed in 29 orders, 153 families, and 1200 genera
- Vary from 1/12 oz shrew to 150 ton blue whale
- TED talk: <https://www.youtube.com/watch?v=sz3Yv3On4IE>



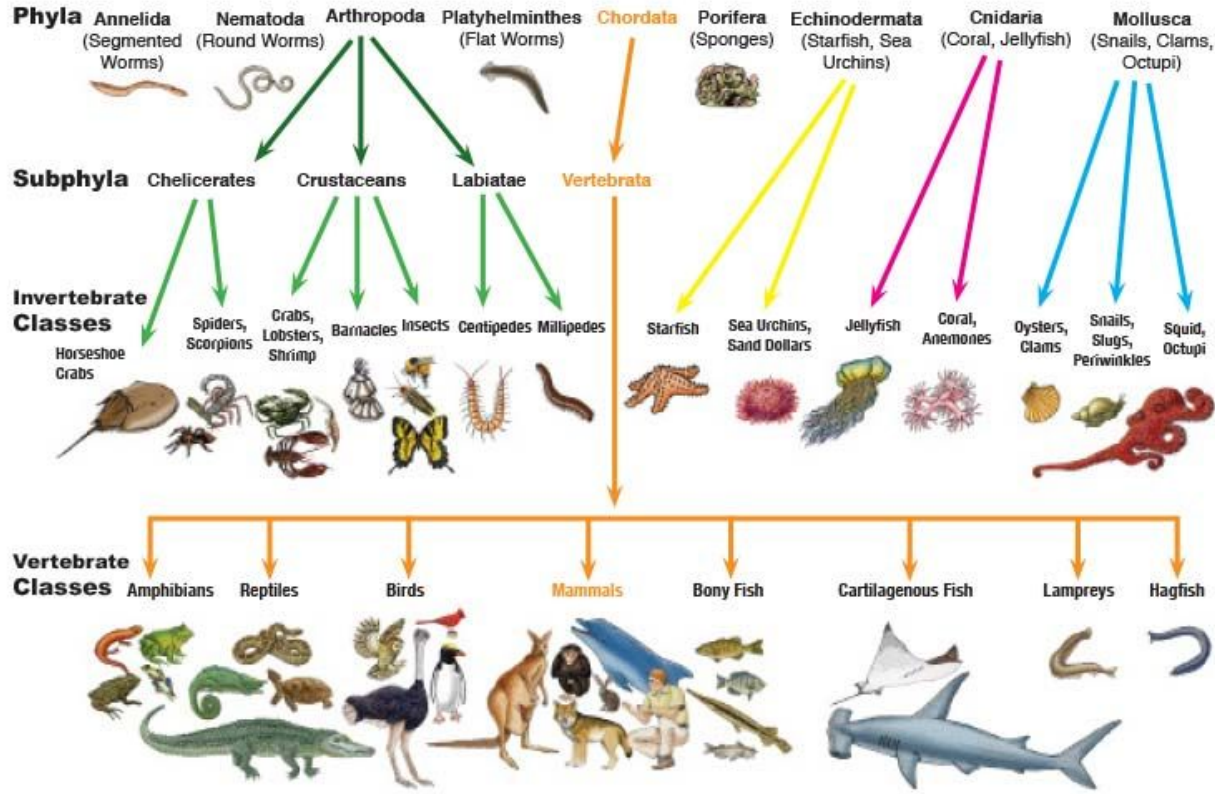


# Requirement 2: Classification Vocabulary: Taxonomy

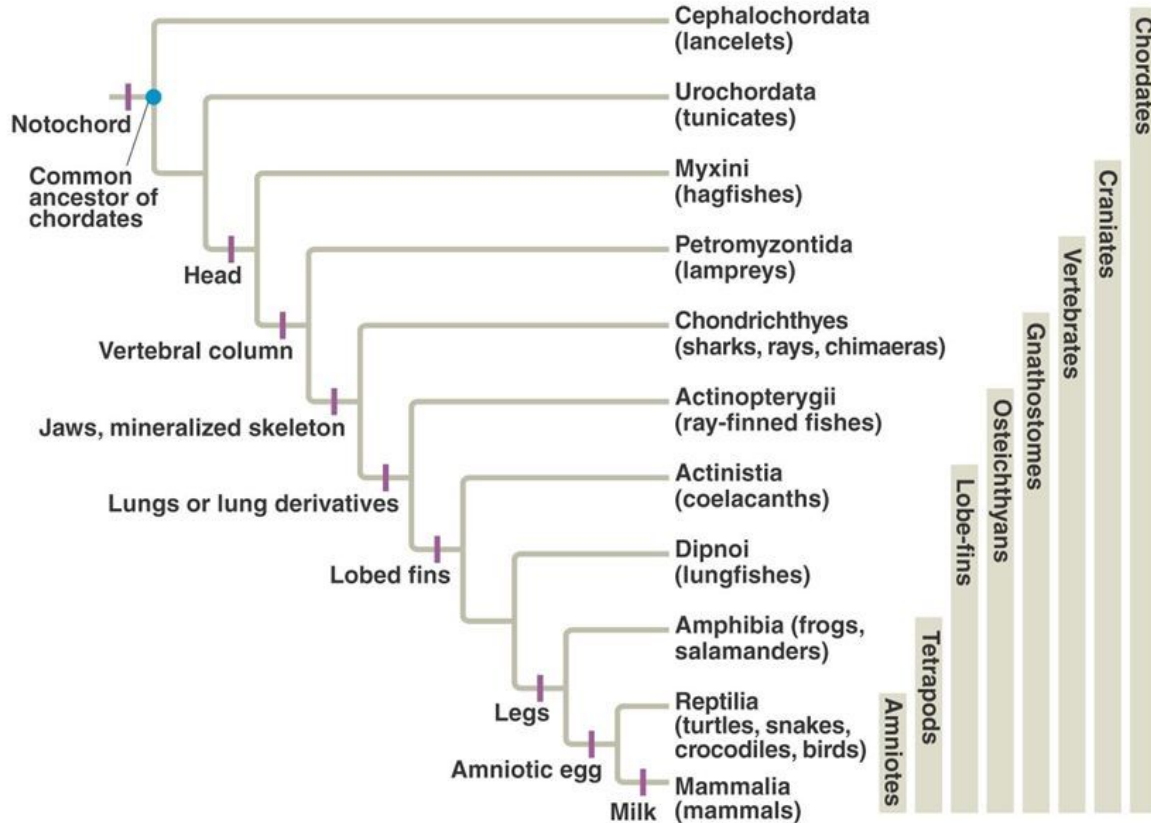
- ❖ Specimen
  - Single member of any species
- ❖ Species
  - Group of animals that pass distinctive characteristics to offspring
- ❖ Genus
  - Group of closely related species that share common attributes
- ❖ Scientific name
  - Genus name (which is first and capitalized) followed by species name
  - Precise
  - Guidelines of the International Code of Zoological Nomenclature
  - Chosen by the “discoverer”
  - *Italicized*
  - *Loxodonta africana*: African Elephant



# Animal Kingdom



# Chordate Phylogeny





# Requirement 2

Phylum	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia
Order	Carnivora	Rodentia	Rodentia
Family	Canidae	Sciuridae	Castoridae
Genus	<i>Canis</i>	<i>Sciurus</i>	<i>Castor</i>
Species	<i>lupus</i>	<i>carolinensis</i>	<i>canadensis</i>
	Gray Wolf	Eastern Gray Squirrel	North American Beaver



# Requirement 3

Do ONE of the following:

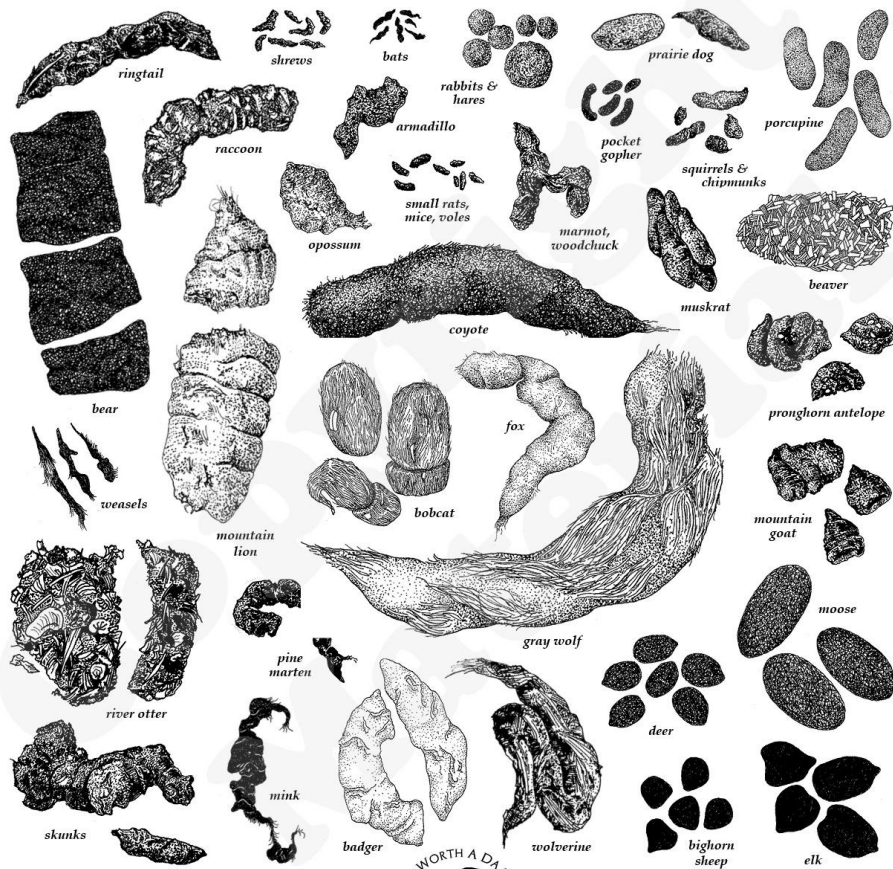
- a. Spend 3 hours in each of two different kinds of natural habitats or at different elevations. List the different mammal species and individual members that you identified by sight or sign. Tell why all mammals do not live in the same kind of habitat.
- b. Spend 3 hours on each of five days on at least a 25 acre area (3.5 football fields). List the mammal species you identified by sight or sign.
- c. From study and reading, write a simple life history of one nongame mammal that lives in your area. Tell how this mammal lived before its habitat was affected in any way by humans. Tell how it reproduces, what it eats, and its natural habitat. Describe its dependency upon plants and other animals (including humans), and how they depend upon it. Tell how it is helpful or harmful to humankind.



# Requirement 3

- List of Natural Areas in Western TN
  - <https://www.tn.gov/environment/program-areas/na-natural-areas/natural-areas-west-region.html>
- List of Mammals in TN
  - <https://www.tn.gov/twra/wildlife/mammals.html>
- Mammals live in different habitats due to different climate, food, water, mating and space needs, and other animals that may be predators or competitors. With increasing population growth and human activity that disturbs the natural habitat, animals must learn to adapt to these kind of threats as well.
- Scat
  - <https://boyslife.org/quizzes/153553/can-you-identify-this-animal-poop/>

# Mammal Scat of North America



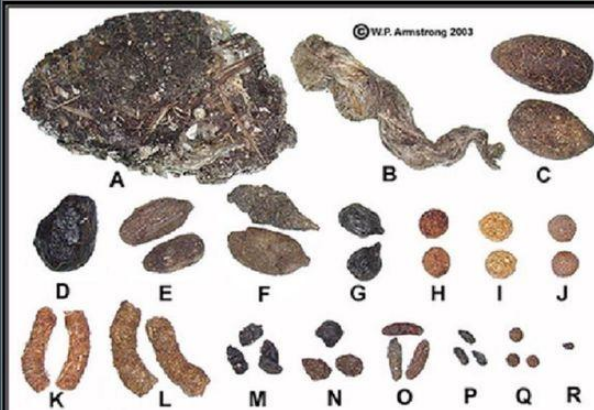
Specimens shown twice actual size



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## Animal Scats Variation between Species (see lab handout!!)



- A. Black Bear
- B. Coyote
- C. Moose
- D. Elk
- E. Mule Deer
- F. Marmot
- G. Bighorn Sheep
- H. Snowshoe Hare
- I. Jackrabbit
- J. Cottontail
- K. Ptarmigan
- L. Dusky Grouse
- M. Ground Squirrel
- N. Chickaree
- O. Woodrat
- P. Chipmunk
- Q. Pika
- R. Little Brown Bat

# Requirement 3

- Nongame mammal: Not hunted for food, sport, or fur
- *Didelphis virginiana*, Virginia Opossum
  - Only marsupial in North America. Throughout the eastern portion of the United States, including all of Tennessee, extending into New England
  - Omnivorous scavenger that eats invertebrates, fruits and berries, bird eggs, small vertebrates, and carrion, which allows it to exploit a variety of habitat types and situations whether on the ground or in a tree. Prefers open forests with a permanent water source, it is equally at home almost anywhere, including agricultural lands and even suburban and urban areas where it is frequently seen along roadways. A solitary wanderer, the opossum seldom remains in a single location for more than a few days. Being primarily active at night, it seeks out cover in the form of brush, hollow trees or logs, or man-made structures by day.
  - Peak breeding happens in the second week of February. Gestation is short (12-13 days), after which an average of 9 tiny (less than ½ inch) young works their way towards the mother's pouch. After 60 days of weaning, the young start to open their eyes and release from the nipples for the first time. At around 80 days, the young begin to control their own body temperature, and leave the protection of their mother after an average of 100 days. Both sexes breed in the first year following birth.





# Requirement 3

- It has 50 teeth, more teeth than any other mammal in the United States.
- It uses its prehensile tail to carry nesting materials, acting as a fifth appendage
- Well groomed.
- When escape is impossible, it feigns death by "playing possum" in which the animal enters a catatonic-like state trigger by stress while emitting a foul odor
- A single opossum consumes 5000 ticks every season. That means the more opossums that are in your area, the fewer ticks you'll encounter
- Great memory! Better than rats, cats, dogs, and pigs. They can also recall the smell of toxic substances up to a year later.
- Immune to the venom of nearly every type of snake found in their native range, the one exception being the coral snake. Possums take advantage of this adaptation by chowing down on snakes on a regular basis.
- Marsupials like possums have a lower body temperature than the placental mammals that dominate North America—in other words, their bodies don't provide a suitable environment for the rabies virus

# Requirement 4

Do ONE of the following:

- a. Under the guidance of a nature center or natural history museum, make two study skins of rats or mice. Tell the use of study skins and mounted specimens respectively.
- b. Take good pictures of two kinds of mammals in the wild. Record the date(s), time of day, weather conditions, approximate distance from the animal, habitat conditions, and any other factors you feel may have influenced the animal's activity and behavior.
- c. Write a life history of a native game mammal that lives in your area, covering the points outlined in requirement 3c. List sources for this information

# Requirement 4

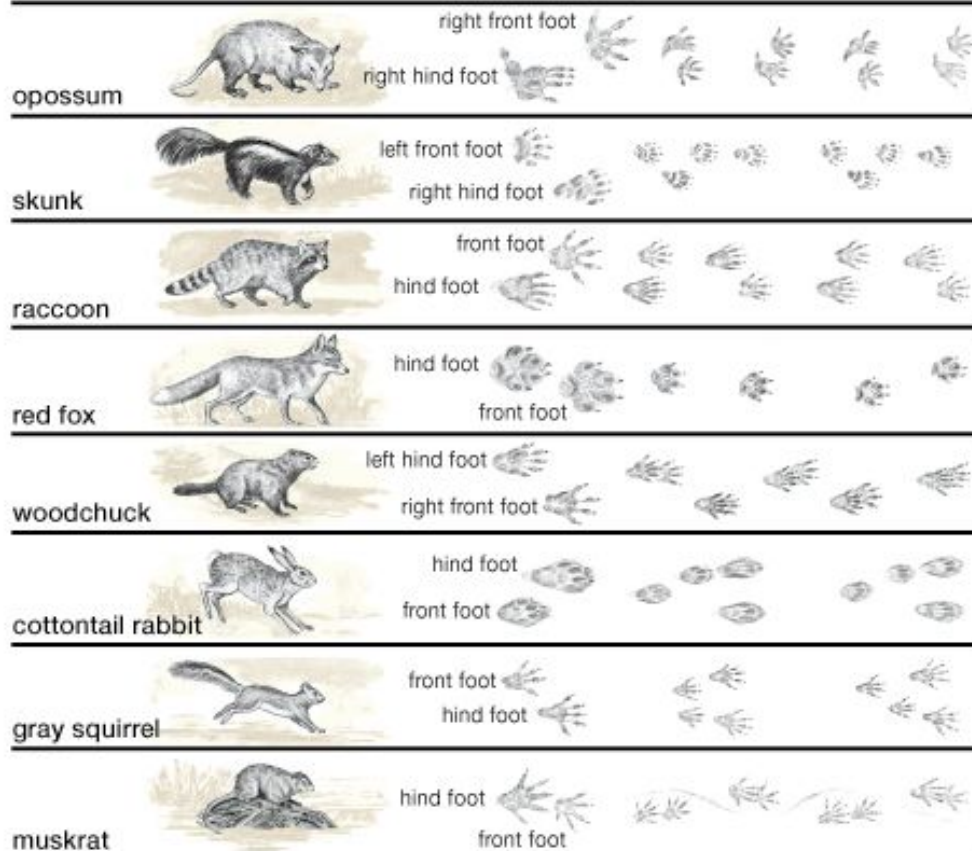
Do ONE of the following:

- d. Make and bait a tracking pit. Report what mammals and other animals came to the bait.
- e. Visit a natural history museum. Report on how specimens are prepared and catalogued. Explain the purposes of museums.
- f. Write a report of 500 words on a book about a mammal species.
- g. Trace two possible food chains of carnivorous mammals from soil through four stages to the mammal.



# Requirement 4





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## COMMON ANIMAL TRACKS





# Requirement 4

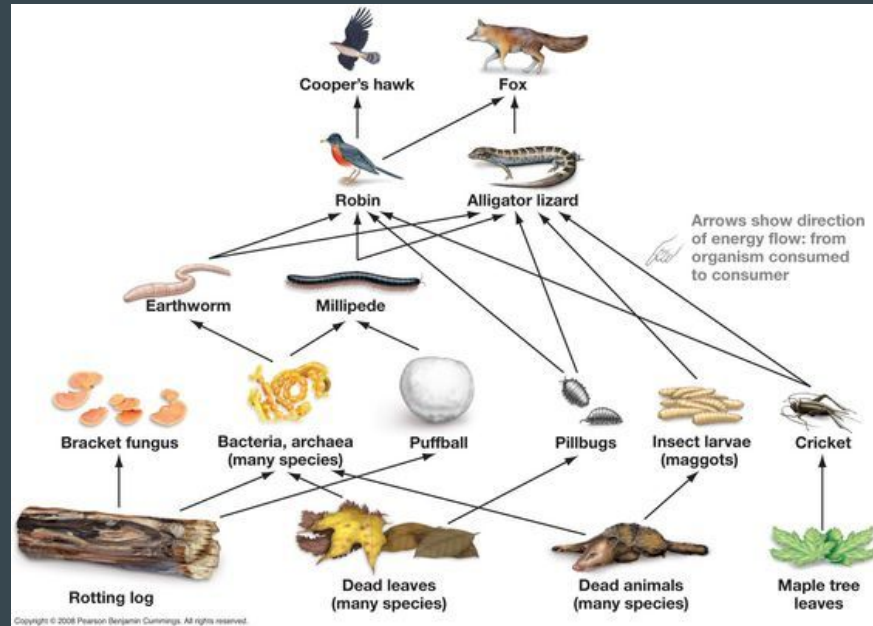
- Smithsonian Natural History Museum
  - <https://naturalhistory.si.edu/visit/virtual-tour>
  - Education, Scientific Study, Knowledge



# Requirement 4

## ➤ Food Chains/Webs

- Grizzly Bear: <https://www.thinglink.com/scene/531491821063241729>
- Coyote: <https://www.thinglink.com/scene/522412555180703745>



# Requirement 4

## ➤ Herbivore

- Eat only plants
- White Tail Deer, Cottontail Rabbit, Porcupine



## ➤ Carnivore

- Eat other animals, including insects
- Weasel, Wolf, Badger



## ➤ Omnivore

- Eat both plant and animals
- Raccoon, Skunk, Bear

## ➤ Insectivore

- Eat insects
- North American shrews and bats



# Requirement 5

Working with the counselor, select and carry out one project that will influence the numbers of one or more mammals.

- Squirrel Feeders: Mason Jar Feeder or Pine Cone Feeder or Fork (Paint Stirrer)/Mason Jar Feeder
- Bat boxes: <https://www.nwf.org/Garden-for-Wildlife/Cover/Build-a-Bat-House>
- Squirrel condos: <https://squirrelrefuge.org/squirrelhousing.html>
- Raccoon nest boxes: <http://www.helpingwildlife.org/images/raccoonnestbox.pdf>

