

# Virtual Discovery Kit.

*Be curious.* | GRAND  
RAPIDS  
PUBLIC  
MUSEUM

Zoology.



grpm.org

Zoologists and animal lovers alike can investigate unique animal specimens from habitats all around the world.  
Discover where these animals live, what they eat and what makes them special!

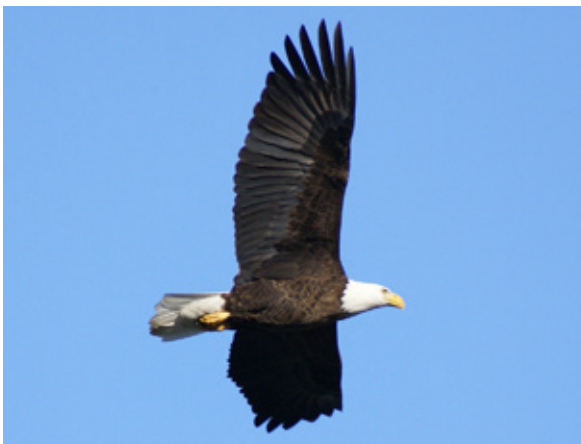
---

Explore the animal specimens in the GRPM digital Collections at <https://grpmcollections.org/Detail/occurrences/350> then have fun with these activities.

## What is Zoology?

Zoology is the study of animals. Zoologists are scientists who study many things relating to animals of all shapes and sizes, including:

- Behaviors and characteristics of individual animals and populations
- The health and diets of animals
- Patterns of where certain animals live
- The relationships that animals have with each other and their environments
- How to protect animal populations from harmful factors
- The scientific classification of animals into different groupings



## References

- Images from <https://www.nps.gov/neri/learn/photosmultimedia/photogallery.htm>
- <https://www.amnh.org/explore/ology/zoology>
- <https://www.aboutbioscience.org/careers/zoologist/>

*Be curious.*



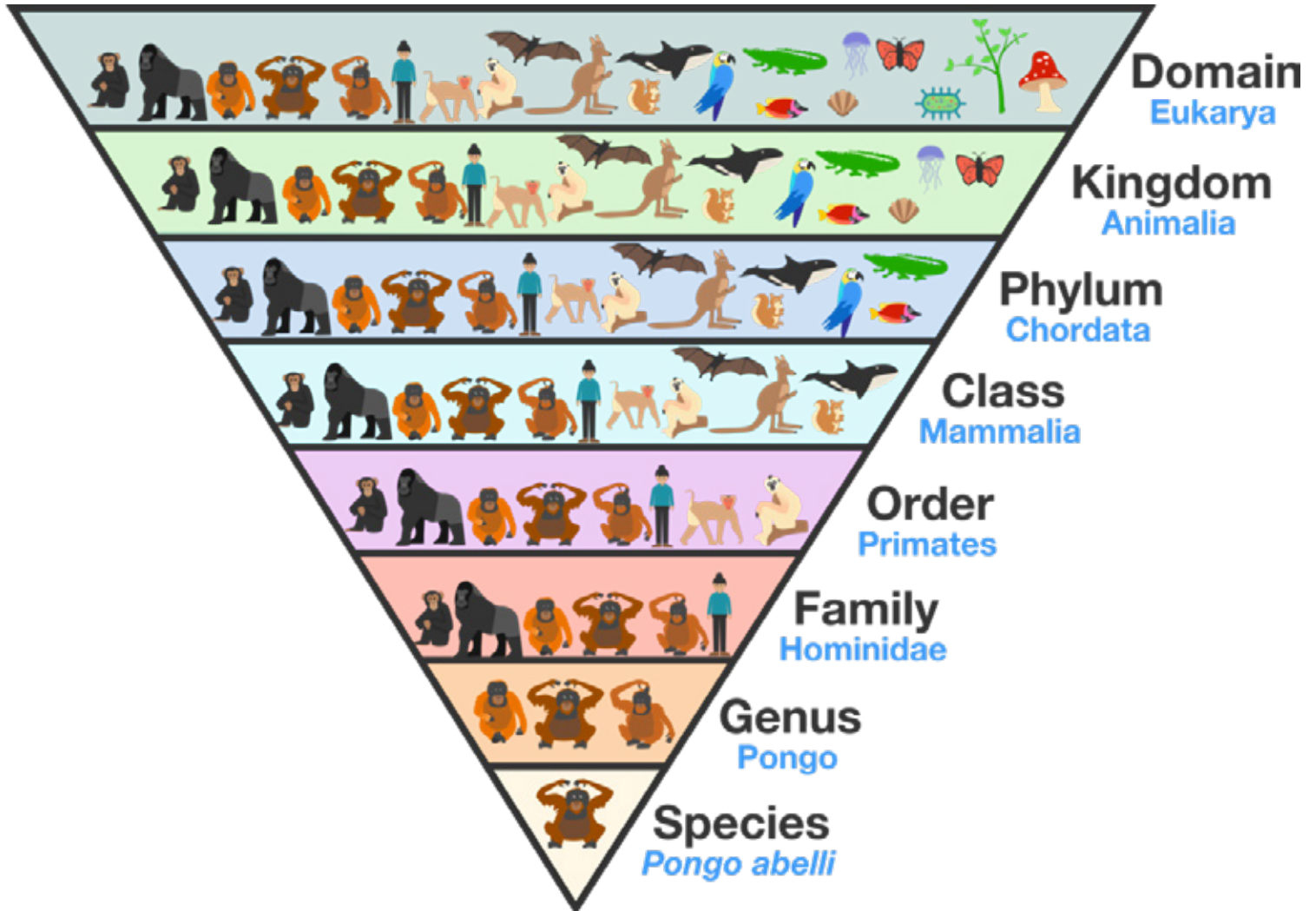
## How Are Animals Classified?

With millions of species of animals in existence, keeping them organized is key. Classifications help zoologists understand animals better and make connections across categories. Living things are classified into based on eight different levels of taxonomy, from broad to specific:

**Domain** → **Kingdom** → **Phylum** → **Class** → **Order** → **Family** → **Genus** → **Species**.

A way to remember the order is with a fun saying - “Did King Phillip come over for great spaghetti?”

Here is an example of an orangutan classification. All of the living things that zoologists study are in the Kingdom Animalia, or animal kingdom. Notice how each level gets more specific with fewer animals until only the Sumatran orangutan is left.

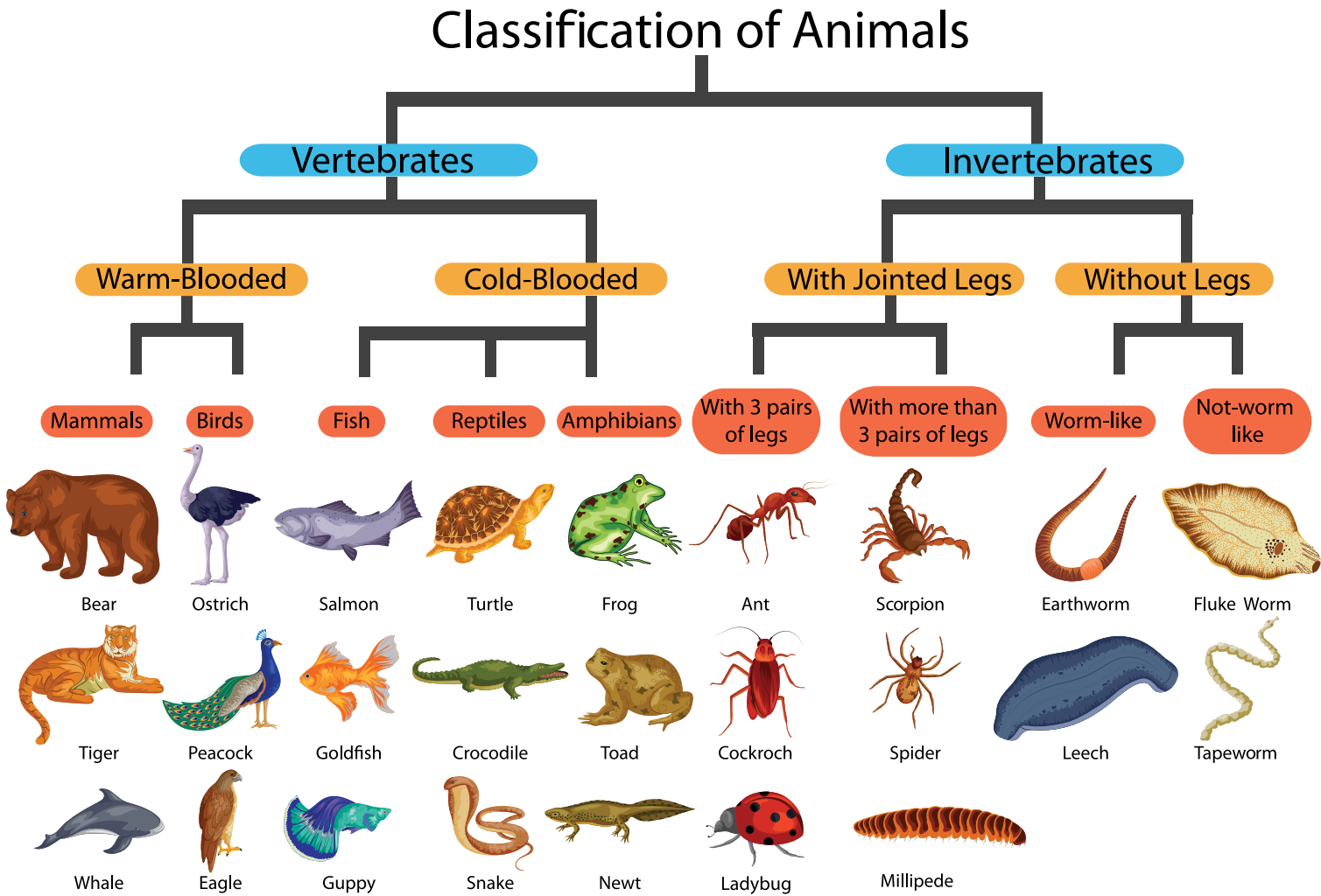


### Take a closer look!

- Can you find the orangutan in each level of taxonomy? Start from the bottom and work your way up!
- How many different animals can you count in the pongo genus? \_\_\_\_\_
- Challenge: How many levels of taxonomy do humans share with orangutans? \_\_\_\_\_

Zoologists also sort animals into categories based on similar characteristics. A common way of sorting animals is based on whether or not they have a backbone. Vertebrates are animals with backbones and invertebrates are animals without a backbone.

The chart below shows the organization of animals into groups that share body characteristics, starting with the two main vertebrate or invertebrate categories.



**Take a closer look!**

- Find an animal that lives in water. \_\_\_\_\_
  - Identify at least 2 body characteristics it is classified by in this chart. \_\_\_\_\_
- Find an animal that has more than 4 legs. \_\_\_\_\_
  - Identify at least 2 body characteristics it is classified by in this chart. \_\_\_\_\_

**References:**

- <https://kids.nationalgeographic.com/animals/>
- <https://www.dkfindout.com/us/animals-and-nature/animal-kingdom/classifying-animals/>
- <https://www.ck12.org/book/ck-12-biology-concepts/section/10.2/>

## Where Do Animals Live?

A habitat is the place where an animal lives. Here an animal can find everything it needs to survive, including food, water, cover and space.

Some examples of diverse habitats around the world are described below. **Follow each link to explore photo galleries and information from National Geographic!**

- [Oceans](#): An ocean is a large connected body of salt water. Oceans cover over 70% of the Earth's surface and hold 97% of its water supply! Oceans are home to extremely diverse animals, such as snails, squid, fish, dolphins, whales and more.
- [Desert](#): Desert habitats can be found on every continent. They are very dry areas that get less than 10 inches of rainfall per year. Some deserts are hot, like the Sahara Desert in Africa, and some are always cold, like the Gobi Desert in Asia. Desert animals have evolved to use less water; common desert animals include camels, desert tortoises, scorpions and armadillos.
- [Rainforest](#): Rainforests have mostly evergreen trees and get large amounts of rainwater. They are threatened today and much of this land is disappearing due to deforestation and other factors. Similarly, many of the animals that call the rainforest home--such as lemurs, gorillas, tigers and rhinoceroses--are now listed as threatened or endangered species
- [Grassland](#): Like their name suggests, grass is the most common plant growth in this habitat. In these flat and open areas, there is not enough rain to allow a forest to grow, but not so little rain there is a desert. Grasslands are home to animals such as zebras, giraffes, prairie dogs, coyotes and badgers.
- [Tundra](#): Tundras are cold and windy areas that do not get much rainfall. They do not have any trees, and are found at the tops of mountains or in the Arctic region. Tundras have snow cover for most of the year, but have a short summer period where flowers grow. Only a few of the toughest animals live in the tundra such as mountain goats, birds, sheep and marmots.

The GRPM West Michigan Habitats exhibit portrays four habitat types that you can find in Michigan: woodlands, marsh, dunes, and lakes. Visit the West Michigan Habitats exhibit at <https://grpmcollections.org/Detail/occurrences/191> to see the variety of animals that call these habitats home.



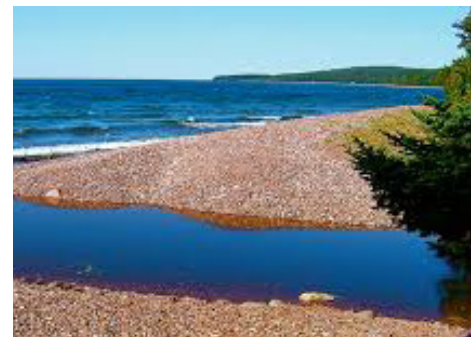
Woodlands



Wetlands



Dunes



Great Lakes

## References:

- <https://www.nationalgeographic.org/encyclopedia/habitat/>
- <https://www.nationalgeographic.com/environment/earth-habitats/>
- <http://www.wvdnr.org/Wildlife/PDFFiles/WYhabitat.pdf>



## How Do Animals Eat?

Different animals eat different types of food. The three main types of animal diets are shown below.



### **Herbivores:**

Diet made up of mostly plants

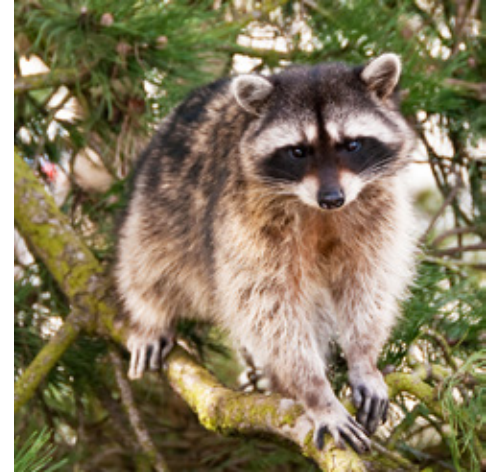
**Examples:** deer, cow, beaver



### **Carnivores:**

Diet made up of mostly meat/flesh

**Examples:** tiger, wold, lion



### **Omnivores:**

Diet made up of both plants and meat/flesh

**Examples:** raccoon, pig, bear

## Predator-Prey Relationships

In nature, many animals survive by eating other animals in their habitat, and other animals spend much of their time and energy protecting themselves from being eaten. The animal that hunts and eats other animals is called the **predator**. The animal that gets eaten is called the **prey**.

A food chain is the path that shows where animals get their food and how that food energy moves through a habitat. Each food chain starts with primary producers, or plants, then shows the movement of food energy from animal to animal, from prey to predator.



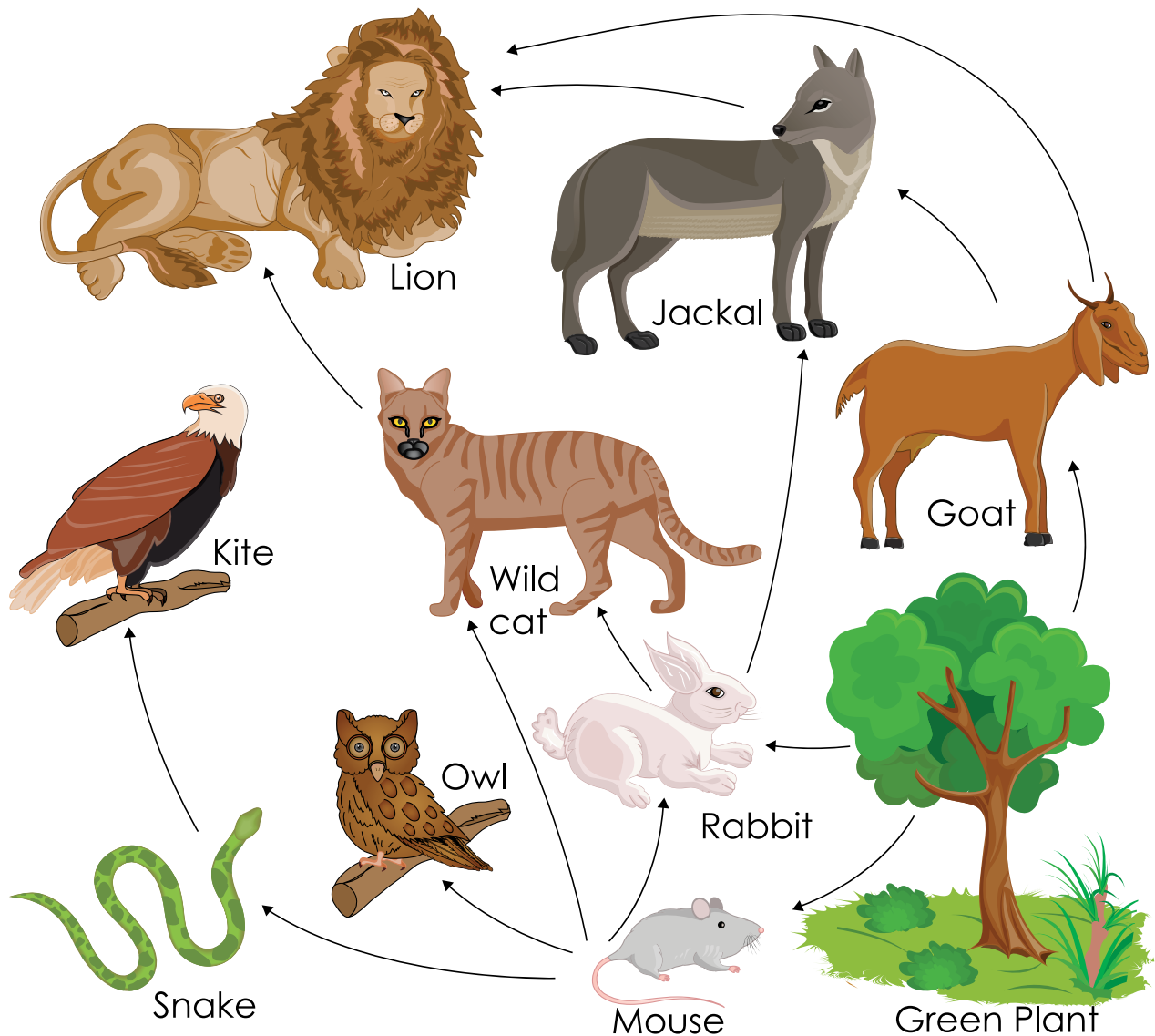
The food chain above starts with grass that is eaten by a grasshopper. The grasshopper is eaten by a frog, which is then eaten by a snake. Lastly, the snake is eaten by the eagle at the top of the food chain. As you can see in the example food chain above, some animals in a habitat can be both predator and prey.

## Food Webs

When many food chains intersect, it is called a food web.

Zoologists are often interested in studying the relationships between predators and prey. **Study the food web below and determine:**

- What is the original source of food in this web?
- List all three species that prey on the mouse.
- An apex predator, also known as a top predator, is an animal in a food chain that has no natural predators. In other words, there are no animals that eat it. **What are the apex predators of this food web?**



## References:

- <https://www.nationalgeographic.org/encyclopedia/food-web/>
- <https://www.nationalgeographic.org/encyclopedia/food-chain/>

## Museum Specimen Study

Specimens are all around us; they are the plants, animals and minerals that make up the world we live in. They form our understanding of Earth and inform humanity's role in the environment. These natural collections represent our planet's diversity at a particular place and time.

### Reading an Object

Learning to 'read' a specimen is a skill to be acquired through practice, just like reading a book. Specimen observations help teach us how to really look at an object and make inferences! Some questions you ask of any natural specimen are included here:

#### Describe

- What color(s) is it?
- Describe its texture, shape, size, structure (e.g., rough, furry, circular, large, four-legged, etc.)

#### Role

- What is it? Animal, plant, rock/mineral?
- What is its role in nature?
- Where is the specimen placed in food chains?

#### Setting

- What habitat (rainforest, desert, tidepool, etc.) would the specimen be found in?
- What is its range (across Michigan, the United States, North America, etc.)?
- Is the object found in the past, present, or both?
- What characteristics helped the specimen survive in its habitat?
- What organisms do you know today that share similar characteristics with this specimen?

#### Big Idea

- What can we learn from it?
- Why was this object chosen from the GRPM Collections?
- How could this specimen be used to tell a bigger scientific story?

**Practice your specimen observations with the Specimen Observations guide! You can make a detailed observation of each fossil in the [Zoology Discovery Kit Collection](#).**





**Specimen Observations**

Object Name:\_\_\_\_\_ Accession Number: \_\_\_\_\_

**Sketch or describe your detailed observations of the specimen**

Consider its texture, appearance, shape and size. Record patterns, markings and anything else you notice.

**Record Measurements:**

Length: \_\_\_\_\_  
Width: \_\_\_\_\_  
Height: \_\_\_\_\_

**What type of habitat do you think this species lives in? Why?**

**Record any other wonderings or observations.**

## Spot the Adaptations

Adaptations are special features of an animal that help it survive in its specific habitat. They are important traits or behaviors that help animals survive by protecting themselves, finding food, finding mates and moving about their environment. Check out the table below to discover examples of the two main types of animal adaptations: behavioral and structural.

**Behavioral Adaptations:** Actions or behaviors that help animals navigate and survive in their environment.

*For example, when the weather becomes colder Canadian geese migrate to a warmer location.*

**Migration:** The movement of an animal from one place to another at certain times of the year to find better temperatures or food sources.

**Hibernation:** When an animal spends a period of time, generally winter, sleeping or saving energy. This is often done when temperatures get cold and there is not enough food available to keep up its movement and energy

**Diet:** What and how animals eat, based on its unique habitat and the availability and types of food there.

**Vocalizations:** When animals make sounds or calls for various reasons, such as to attract a mate or alert others in their area of dangers like predators.

**Structural Adaptations:** Physical characteristics of an animal, like the size, shape or coloration of its body.

*For example, ducks have webbed feet that help them swim through the water faster and easier.*

**Wings:** Birds, bats and insects are among the animals that have wings allowing them to fly.

**Fur:** Animals that live in colder environments rely on thick fur to keep their body temperature warm enough to survive.

**Camouflage:** A color or shape of an animal's body that helps it blend into its surroundings.

**Mimicry:** Some animals have the similar physical appearance of a plant or another animal. Mimicry is often used as protection against predators.

**Tooth shape and size:** Carnivores, meat-eating animals, have sharp and pointed canine teeth which are used for tearing food, particularly flesh.

- Investigate the photographs below and describe at least one adaptation each animal appears to have.


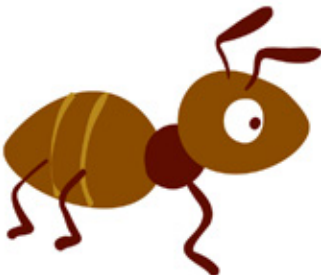












## References:

- <https://www.usi.edu/media/1751789/AnimalAdap.pdf>
- <https://extension.tennessee.edu/publications/Documents/W773.pdf>
- <https://public.wsu.edu/~rlee/biol103/museum.pdf>

**Nature Scavenger Hunt**

Animals are all around us! You can practice making observations like a zoologist in your own community. Stroll through your neighborhood or a park and see if you can find any of the animals on the grid below.

 <p>bird</p>	 <p>ant</p>	 <p>bug</p>	 <p>butterfly</p>
 <p>squirrel</p>	 <p>dog</p>	 <p>rabbit</p>	 <p>skunk</p>
 <p>grasshopper</p>	 <p>caterpillar</p>	 <p>bee</p>	 <p>cat</p>

**Sketch or list any other animals you find on your walk!**

- Were you surprised by any observations on your walk?
- Describe any special adaptations these animals have to survive in your local habitat.



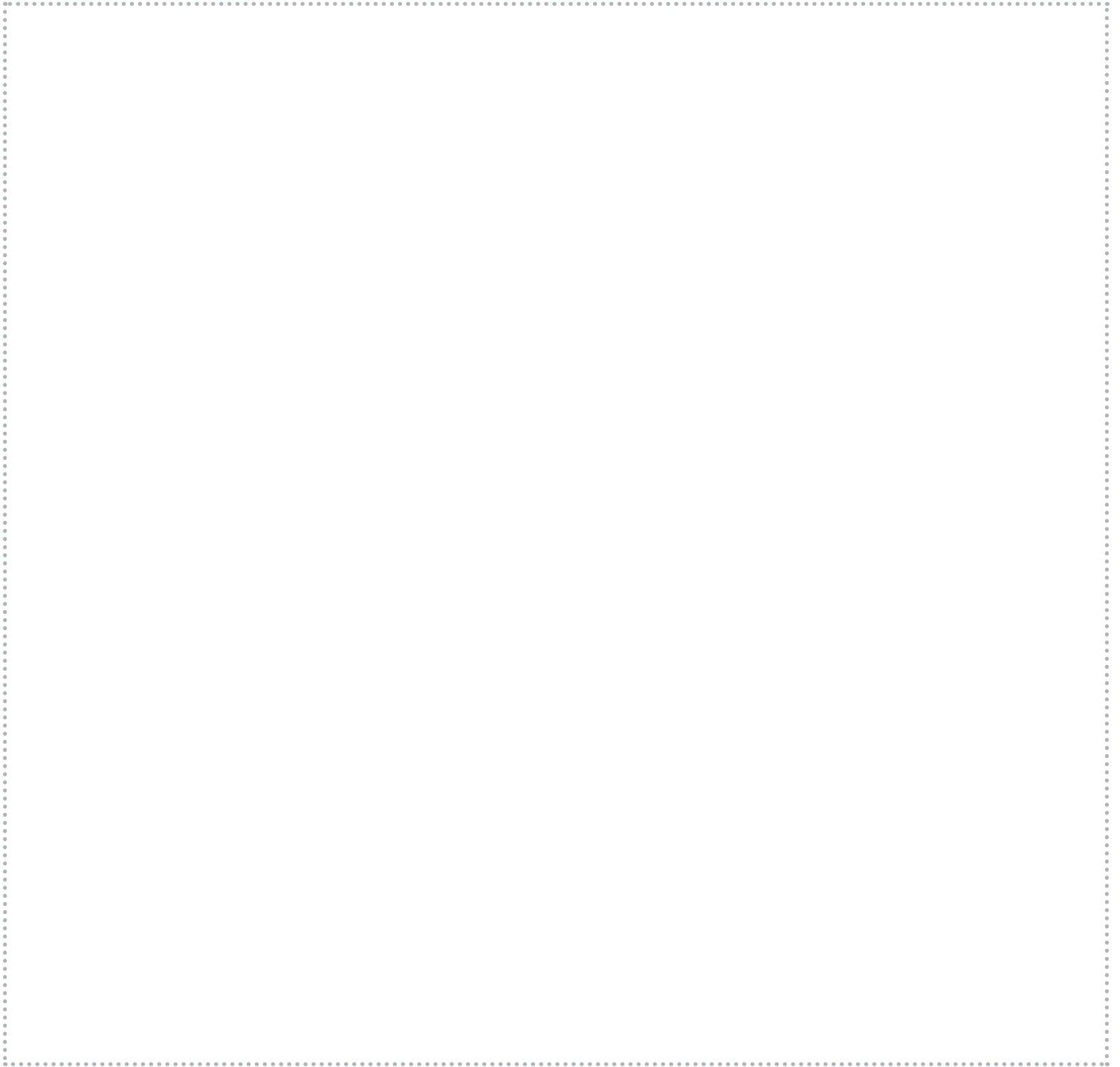
## Create Your Own Creature

Challenge yourself to bring all the information from this resource together to create your own unique creature.

Use the following questions to plan. Then, using materials available at home, bring your creature to life! **Consider:**

- What will you name your creature?
- What will it eat? Is it a carnivore, herbivore, or omnivore?
- Where does it live?
- What special survival adaptations does your creature have?

**Use this box to plan and sketch your creature.**



**Now make a model and bring your creature to life.**

**You can share your creation with the GRPM by sending it to [info@grpm.org](mailto:info@grpm.org).**

*Be curious.*

## What Do You Think?

- What is your favorite animal? Why?

---

---

---

---

- Would you enjoy having a career as a zoologist (studying animals)? What would you like about it?  
What parts might not be so good?

---

---

---

---

- What do you think is the coolest specimen in this kit? Why?

---

---

---

---

- What is the most interesting thing you learned in this discovery kit?

---

---

---

---

- What is one question you still have about zoology?

---

---

---

---

## Learn more!

Learn more about zoology at the American Museum of Natural History's Zoology for Kids website. Explore games, stories, hands-on activities, and videos to sharpen your zoologist skills. Choose from a variety of games related to animal adaptations.

<https://www.amnh.org/explore/ology/zoology>

Visit BioKIDS to access kid-friendly information about a wide variety of common animals found in Michigan

<http://www.biokids.umich.edu/critters/>

Explore DK Find Out's website to learn about animals and nature.

<https://www.dkfindout.com/us/animals-and-nature/>

Explore animal adaptations.

<https://www.legendsoflearning.com/learning-objectives/adaptation/>