



*Classification: Organizing and Describing Diversity*

## Activity 1: What is Classification?

### Key Question

How can we use physical characteristics to classify organisms?

### Objectives

- Students will **classify** organisms into groups based on adaptations and traits
- Students will **compare, contrast, and discuss** the traits of different organisms

Grades: 2-5

Time: 45 minutes

Location: Classroom

### Materials

- ☐ Attached worksheets
- ☐ Computer with internet

### Culminating Activity

After exploring the importance and process of classification, students will apply the concept of biological classification to a real **hierarchy** of birds, analyzing bird photos and organizing them into groups based on physical characteristics.

### Directions

#### Engage students:

Choose something from around the room and ask students to make some observations.

- What is it?
- How would they describe it?
- What makes it what it is?

Repeat with another object. Ask students to compare/contrast these two things. How are they similar, how are they different? Write on the board, noting what, if anything, these objects have in common.

- Ask students if they can define **classification** (*a process of organizing or categorizing something according to shared characteristics.*)

We use classification every day to help us understand the world around us - to know what the function of different things are, to start making sense of a group of random things.

Next, collect assorted objects and put them in piles in the center of tables\*. There should be the same objects in each pile. Split students into small groups, and they will work together to come up with some sort of a system to organize these things. They can place the objects into 4-6 piles. Ask each group to write down how they organized their objects.

**\*Note:** Can have groups use the same objects or have each group classify different objects.

Have each group walk around the room and discuss/guess how other groups classified their objects. Then, ask each group to share their classification strategy and write it on the board.

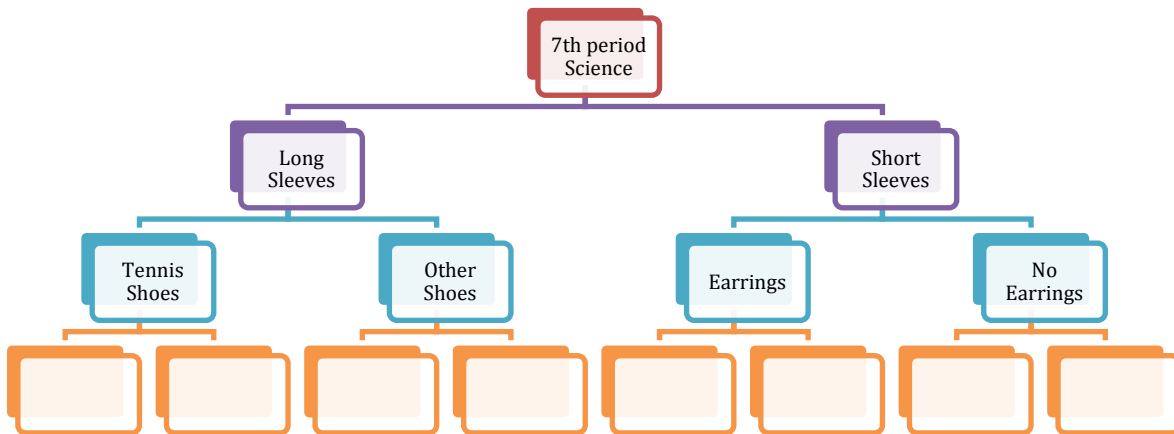
Lead a discussion with students using scaffolded questions such as:

1. What was your classification strategy? Did you consider other classification strategies?
2. Why did you choose this strategy rather than another?
3. Did you classify based on what the object looks like (color, shape, texture) or something else like function (what the object is used for)?
4. How do you use classification in your everyday life? Provide some examples (*food, cars, school subjects*)
5. Why do you think it is important to classify things in our world?

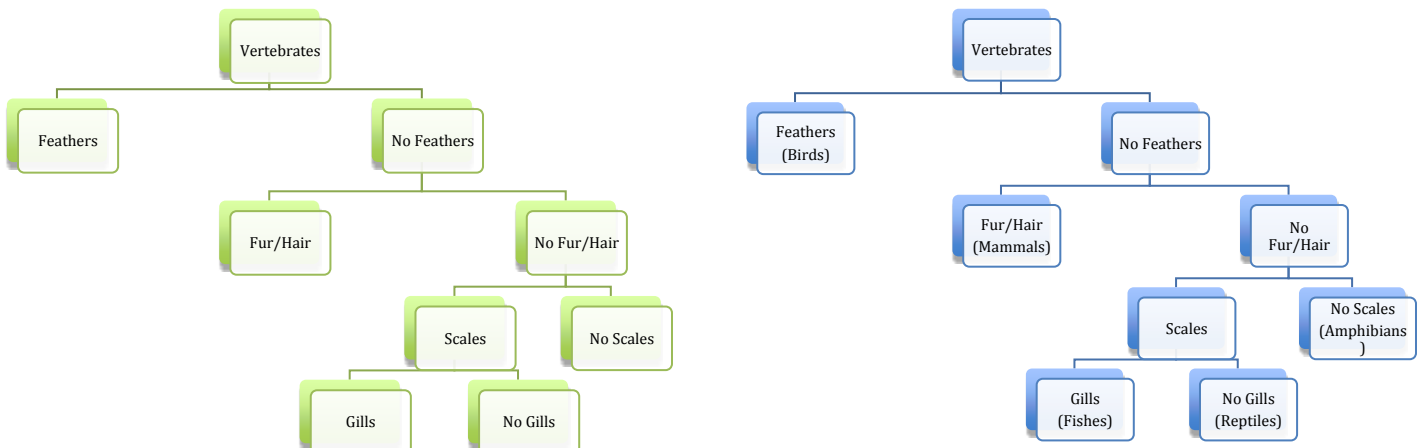
### Explore: Modeling Classification (15 minutes)

Explore how we can use classification to help us narrow down and define a large group into more specific groups based on physical characteristics. We will use humans as an example, and classify ourselves based on our clothing and accessories. Facilitate [Modeling Classification lesson found here](#). Draw a hierarchy tree as described in the Modeling Classification lesson as a model of the classification.

Example hierarchy from Modeling Classification activity



Example hierarchy trees based on animal physical characteristics;



### Explain (5 minutes)

Ask students (if you have led [Skillbuilder Activity 3](#)) if they remember how many named species are on Earth, or ask them to guess how many named species are on earth? (A: *Nearly 2 million species named with millions more that have yet to be discovered*).

Scientists use a **classification system** just like this to classify organisms based on characteristics. This hierarchical system is one aspect of **taxonomy** - or the science that identifies, describes, classifies and names living things. Historically, organisms were organized into different groups based only on observable (physical) characteristics. However, with modern technology like DNA analysis and genetic barcodes, scientists have significantly improved this system - creating genetic trees instead of ones based only on physical characteristics. We will focus on the **physical or observable characteristics** that allow us to organize living organisms.

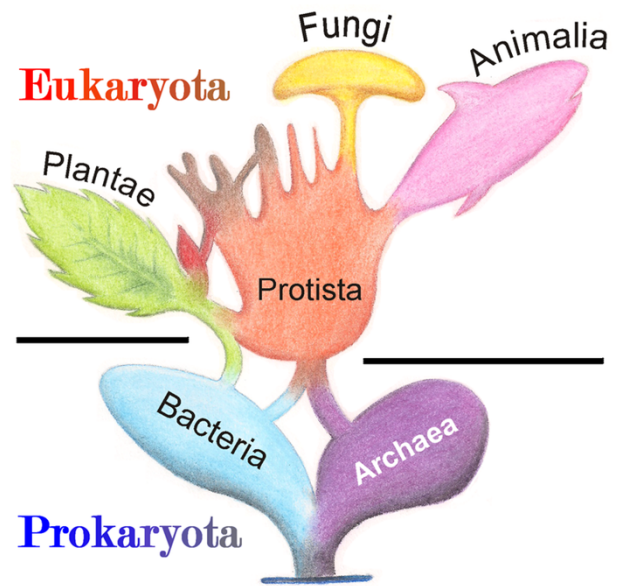


Image: Maulucioni y Doridi CC-BY-SA

Watch this [StudyJams video](#) about the kingdoms of life. We will focus on the kingdoms within the *Eukaryota* domain. These kingdoms include plants, animals, fungi, and protists (a diverse group of eukaryotic organisms that are unicellular and sometimes colonial; often include protozoans, most algae, and some fungi.)

### Elaborate

Let's practice using classification to organize groups of real organisms! In this activity, use the attached Bird Classification Worksheet to organize this group of birds based on physical characteristics.

Students can cut out the pictures of birds and work in small groups (2-3 students) to put birds into branches of the tree based on their physical characteristics. After reviewing the worksheet, students can paste birds into the correct places.

### Evaluate

Review worksheet with students and discuss the differences between groups of birds. Share and write the common and scientific name for each species so students can add these to their trees.

Lead discussion with students, refer to key below. Recommended questions:

1. What do you think is the purpose of the birds' feet shape/type?
2. What do you think is the purpose of the birds' bills?
3. Have students seen any other birds they believe fit into these groups? What is the name of the bird, what physical characteristics does it have that make it a part of that group?
4. Can students think of birds (locally and/or globally) that don't fit into any of these groups? What different physical characteristics do those birds have?

## Next Generation Science Standards

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.



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### Bird Classification Key for teachers

	Common Name	<i>Scientific name</i>	Feet	Bill
	Mallard	<i>Anas platyrhynchos</i>	Webbed for swimming	Bill flat, broad for eating aquatic plants
	Brown Pelican	<i>Pelecanus occidentalis</i>	Webbed for Swimming	Bill long, pointed with throat pouch for carrying fish
	Osprey	<i>Pandion haliaetus</i>	Talons for catching prey	Bill large and hooked for tearing prey
	Hairy Woodpecker	<i>Leuconotopicus villosus</i>	Two toes in front, two toes in hind of foot for climbing trees	Bill long, pointy, strong for pecking wood and removing insect prey
	Tree Swallow	<i>Tachycineta bicolor</i>	Perching feet for clasping around small branches	Bill short, wide for screening and capturing flying insects
	Pine Warbler	<i>Setophaga pinus</i>	Perching feet for clasping around small branches	Bill narrow, pointed for removing insects from foliage
	House Finch	<i>Haemorhous mexicanus</i>	Perching feet for clasping around small branches	Bill short, thick, strong for cracking seeds

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