

Students explore the amazing diversity of life on Earth and discover how plants and animals are adapted for survival. This activity helps students understand why there are so many different species and teaches them the value of biodiversity.

# CHARTING BIODIVERSITY

## SUBJECTS

Science, English Language Arts

## PLT CONCEPTS

1.1, 2.3

## STEM SKILLS

Cooperation, Investigation, Organization

## DIFFERENTIATED INSTRUCTION

Cooperative Learning, Higher-order Thinking, Literacy Skills, Student Voice

## MATERIALS

Paper lunch bags or other containers (three per pair of students), resources on animals.

## TIME CONSIDERATIONS

*Preparation:* 30 minutes

*Activity:* 50 minutes, plus time for research

## OBJECTIVES

Students will

- Organize different species of plants and animals according to their physical characteristics.
- Determine how certain characteristics help species adapt to environmental conditions.

## BACKGROUND

See the Background for the activity Discover Diversity.

## GETTING READY

- Make one copy of the Match-Up Cards and Biodiversity Match-Up student pages for each pair of students.
- Find resources that students can use to research local wildlife, including websites, field guides, or other books. For a few places to start, see the resources for this activity at [plt.org/myk8guide](http://plt.org/myk8guide).
- See the Spice of Life game in the Enrichment section for an adapted activity that doesn't involve student research.



# FOREST FACT

In the United States, roughly two thirds of at-risk and endangered species rely on private forestlands. Foresters employ sustainable practices to maintain or increase forest biodiversity by reforesting areas, restoring threatened species and habitats, and controlling invasive species.



## DOING THE ACTIVITY



**1** Ask students to name a wild animal that lives near them, such as a squirrel, a robin, or a spider. Encourage them to think about what characteristics—or adaptations—the animal possesses that might help it live where it does. For example, squirrels can climb trees, which enables them to gather acorns and other nuts for food. Point out another type of environment (such as forest, ocean, or desert) and ask what different kinds of characteristics animals living there might need.

**2** Explain that students will learn how animals in different environments are adapted to their environments. Divide the students into pairs. Give each pair copies of the student pages and three lunch bags (or other containers). Have the students label the bags as follows:


- Where I Live
- How I Move
- What I ‘Wear’




**LITERACY SKILLS** Make sure that students understand all the words on the student page.

**3** Have students cut out the individual squares in the first column of the Match-Up Cards student page and put them into the bag labeled “Where I Live.” Then have them cut out the squares from the second column and place them in the “How I Move” bag. The squares from the third column, which include different types of animal coverings, go into the “What I ‘Wear’” bag. Have them shake the bags to mix up the squares.


**4** To start, have one member of each pair take a square from each bag. Have students write the words in the top row of the Biodiversity Match-Up student page. They should take turns doing this until all the bags are empty.

**5**  **COOPERATIVE LEARNING** Explain to the students that they will complete the last columns of their charts by filling in the name of an animal species that has all three of the characteristics listed in a row. For example, if a row lists *forest*, *the ability to fly*, and *exoskeleton*, the students should do research to find one or more examples of an animal living in the forest that has these two adaptations. (A good example would be a forest-dwelling insect such as a katydid.) For each animal, they should also identify how that species is especially suited, or adapted, for the environment in which it lives.

**6** Give the students time to research animals and fill in their charts. If they are not able to find an animal that fits a particular combination (for example, if the chart requires them to find an animal with fur that flies and lives in the water), allow them to pick a different characteristic for one of the columns.

**7**  **HIGHER-ORDER THINKING** After they've finished their research, have the students present their findings to the rest of the group. For each species, students should be prepared to say how that species is especially suited, or adapted, for the environment in which it lives.

## VARIATION: PLANT ADAPTATIONS

**1**  **STUDENT VOICE** Have students do the activity using plants instead of animals. The group should decide on three categories for identifying plants, such as “Where It Lives,” “How It Reproduces,” “How It Depends on People and Other Animals,” or “How It Protects Itself.” Pairs should label their three bags with the categories they choose.

**2** Students then should make four cards for each category. For example, if they choose the category “How It Reproduces,” they could make cards for “Has Tasty Fruit” (for spreading seeds), “Has Bright Flowers” (for attracting pollinators), “Has Seeds That Float” (and can be carried by the wind or water), or “Grows New Plants from Roots” (for plants like ivy). They should put these cards in the appropriate bags.

**3** Each pair should make a blank chart similar to the Biodiversity Match-Up student page, with plant categories instead of the animal ones. Each partner takes a turn picking a set of three cards from the bags, while the other partner fills in the appropriate words on the chart. Together, they should think of or research a plant that has those three characteristics.

## TAKE IT OUTSIDE



Invite students to bring magnifying lenses and journals outside to record their observations of an animal. Encourage them to locate one, observe it up close, and draw a picture of it. They should also note other observations, such as the animal's behavior. (Depending on your site, students are most likely to find insects or small invertebrates like ants, pill bugs, or worms, but they may also find birds, mammals, or other animals.) Challenge students to determine which of the animal's characteristics or adaptations might help it to survive, grow, and reproduce. You may have students observe plants as a different option.



## ACADEMIC STANDARDS

### SCIENCE

#### Practices

- Obtaining, evaluating, and communicating information

#### Concepts

- Structure and function

### ENGLISH LANGUAGE ARTS

#### Practices

- Reading informational text: integration of knowledge and ideas
- Speaking and listening: presentation of knowledge and ideas

## ASSESSMENT

Ask students to

- Look at the list of animals presented by the entire group and sort them into categories according to where those animals live and how they move.
- Choose three organisms and explain how they are suited to their environment.

## ENRICHMENT

- Have the students use the cards to play a Spice of Life game.
  - » Teams of two play against one another. Put the cards (plant or animal) into the appropriate bags from the activity.
  - » Have students create six additional cards that say “Wild Card” and add two to each bag.
  - » To play, each team should draw a card from each bag. The opposing team must try to think of an animal or plant that has all the characteristics printed on the cards. If a team pulls a wild card, they can pick any characteristic they want, provided it fits the category of the bag it came from.
  - » Younger students can pick just one card per play and think of a plant or animal with that trait. They can alternate the bag from which they pick on each turn.
  - » Develop rules for dealing with disputes. For example, if one team disagrees with another team’s answer, they can look up the plant or animal in question to determine who is right.
  - » Have the students keep track of their scores. A good answer wins one point, and a poor answer or no answer gets no points.
  - » When the bags are empty, the game is over. Have the students add up their points to see which team is the winner.



- Invite students to “engineer an animal” for a specific environment. First, have them identify the environment and think of characteristics that might help an animal survive there. For example, forest animals might have physical structures that help them climb trees, like sharp claws or long limbs, or abilities to make use of limbs, branches or leaves, like prehensile tails or stomachs that can digest leaves. Challenge students to design and create a model of an animal characteristic that has at least one moving part, and to explain how that structure would increase the animal’s chance of survival. Provide materials for students to use, such as egg cartons, paper clips, chenille sticks, scratch paper, etc.
- Explore cultural diversity by finding different common names (based on region or language) for the plants and animals that students researched in the activity. For example, depending on where you live, a pill bug may be called roly poly or tater bug. And a yellow poplar may be called tulip tree or tulip poplar.
- Explore adaptations of tree species that live in different environments. For example, palm trees that live in dry areas have spiny trunks that discourage animals from eating their leaves and fruit, and many tropical rainforest trees have leaves with “drip tips” that enable rain to run off quickly, reducing fungal and bacterial growth.





NAME \_\_\_\_\_ DATE \_\_\_\_\_

**Where I Live**

**How I Move**

**What I 'Wear'**

GRASSLAND	SWIM	EXOSKELETON
DESERT	BURROW	FEATHERS
FOREST	CRAWL, HOP, WALK, OR RUN	SCALES OR MOIST SKIN
WATER	FLY OR GLIDE	FUR



## CAREER CORNER

**NATURE PHOTOGRAPHERS** help to document elements of our natural world with photos and video. They sometimes travel to remote areas, where they patiently wait to capture the perfect moment depicting wildlife and nature.

I LOVE MY  
**GREEN JOB!**



NAME \_\_\_\_\_ DATE \_\_\_\_\_

Where I Live	How I Move	What I "Wear"	Who Am I?	How I Am Suited to Where I Live



## CAREER CORNER

**WILDLIFE CONSERVATIONISTS** (con-sir-VAY-shun-ists) are scientists who study wild animals and their habitats. Wildlife conservationists may help control diseases and harmful insects to keep wildlife habitats healthy.

