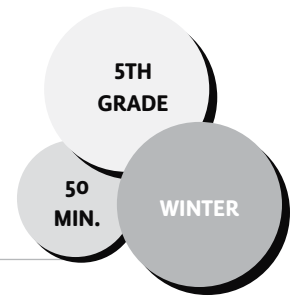


Web of Life

THEME: EXPLORING THE ECOLOGY OF FOOD



ESSENTIAL QUESTION

How are all living creatures connected?

LEARNING OBJECTIVES

- ✓ Students will be able to explain the interdependence of plants and animals.
- ✓ Students will be able to demonstrate how energy is transferred between living things.

CONCEPTS

consumers decomposers food web
interdependence producers

ENGAGING THE CLASSROOM TEACHER

- Prior to the lesson, ask the teacher about students' familiarity with the terms consumer, producer, and decomposer and the concept of a food web. Together you can determine how to structure Action Step 6 and whether there is a younger class of students who students would enjoy performing for.
- During Action Steps 4 and 5, suggest that the teacher support students who might need extra help in understanding their role in the food web.

LESSON DESCRIPTION

In this lesson, students consider the interdependence and transfer of energy between living things by creating food chains and participating in a yarn food web activity. This lesson is designed to be taught in conjunction with lessons What do Plants Eat? and Cycle of a Nutrient.

MATERIALS

- Play dough (or a piece of bread or paper)
- One set of Food Web Role Cards (pp. 537-540)
- Tape
- Producers, Consumers, and Decomposers Poster (p. 541)
- Yarn or string

PREPARATION

- › Consider finding a large space, such as the gym or outdoors, to create your food web, so there's plenty of room for students to make the circle.
- › Photocopy and cut apart the Food Web Role Cards.
- › Set aside the following cards for your demonstration of food chains:
 - › Simple chain: sun, carrot, human
 - › Complex chain: sun, carrot, slug, chicken, coyote, bacteria

ACTION STEPS

1. Engage: Gather students in a circle and ask students to perform a simple physical activity such as running in place. Ask, *What do you need so you can do that?* Once students say, “energy,” ask, *Where did you get that energy from?* Once students answer “food,” say, *Of course! We get energy from the food we eat.* Ask for a volunteer to tell you what they ate that day that gave them energy. Then walk students through the chain of that food. For example, *If you had a glass of milk, where did the energy in the milk come from?* (Cow!) *Where did the energy in the cow come from?* (Grass!) *Where did the energy in the grass come from?* Remind students that green plants are the only living things that can make their own food or energy from the sun. **(5 min.)**

2. Demonstrating a Food Chain: Pass out several Food Web Role Cards that would make a food chain. Start with a simple one of a human eating a vegetable, such as sun, carrot, and human. Have the sun give the carrot a piece of play dough, and explain that it represents the energy from the sun that the carrot stores. Now tell the class that only 10 percent of the energy that the carrot gets from the sun is passed on. Have the carrot break off one-tenth of the play dough, and pass it to the human. Next, demonstrate a more complex food chain, for example, the sun, carrot, slug, chicken, coyote, and bacteria. Have those students stand up and order themselves with the class’s help. Check for understanding by asking students how they know. Again, have the sun pass a big hunk of play dough to the corn, but this time the corn passes 10 percent to the slug, and the slug passes 10 percent of

that to the chicken, and so on, so that just a teeny speck is being passed. **(10 min.)**

3. Explain the Activity: Explain, *We just created a food chain, but next we’ll create a food web to see the interdependence of many plants and animals on one another and how the sun’s energy gets passed. Interdependence means how different plants and animals depend on one another.* Pass out the rest of the Food Web Role Cards and tape, and have students affix their role card prominently to their shirts. **(5 min.)**

4. Identifying Producers, Consumers, and Decomposers: Display the Producers, Consumers, and Decomposers Poster and ensure that students understand their role and place in the food chain. Depending on the space you have and the energy level you want to create, when you give the prompts that follow, you can have students either raise their hands, stand up, or stand in a circle and take a step forward. Say, *If you can make food from sunlight, raise your hand. You’re the plants, or producers! If you are an animal that eats plants and/or animals, raise your hand. You’re consumers! If you help break down dead plants and animals, raise your hand. You’re decomposers!* **(5 min.)**

5. Making a Yarn Food Web: Have students gather in a circle and have the sun stand in the middle of the circle with the ball of yarn. Explain, *A food web consists of many food chains. For example, a hawk might eat a snake that has eaten a frog, but a hawk might also eat a mouse. We’ll show all those relationships with this ball of yarn.* Say, *The sun must pass its energy to someone who can receive it, and*

then that person must pass the yarn to someone who can receive it. In other words, you pass the ball to someone who can eat you! So, if the ball gets passed to you, hold a piece and then pass the ball to someone who you can give your energy to. Keep the chain going as long as you can, and then cut the yarn, and pass the ball back to the sun to start a new chain, but make sure everyone keeps holding onto their place in the chains you've already made. Keep creating new chains until all students are holding at least one piece of yarn. **(15 min.)**

6. Discussing: Ask students to think of scenarios that would affect the food web (e.g., a drought or deforestation). Discuss these hypothetical scenarios, and have students tug on the string if they would be directly affected. Ask who felt the tug, and then have those students tug on the string. Try it out with some positive scenarios too, such as a farmer feeding compost to the plants to make them healthier. Discuss how an event that affects one living creature in the food web eventually affects other living creatures that rely on it. **(5 min.)**

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

Social and emotional learning

- What did you enjoy about the activity?
- What was challenging or frustrating? What solutions can you think of to make it better?

Check for understanding

- Why is it important to have a food web with many different plants and animals in it?

- How did the yarn food web activity affect your thinking about plants and animals around you?

ADAPTATIONS

Garden Setting: Have students bring out clipboards and paper, and make a list of every living thing they observe in the school garden, from insects, to plants, to birds flying overhead and squirrels in the trees. Then have students make role cards for these creatures, and create a yarn food web for the garden.

Research Extension: Have students research consumers specific to your ecosystem. Have each student determine what that consumer eats, and have them visually represent a food chain that includes that animal.

Small-Group Variation: Instead of a whole-class activity for Action Step 4, you might consider passing out sets of role cards, chart paper, glue sticks, and string to groups of students. They then must create a visual representation of a food web.

ACADEMIC CONNECTIONS

Next Generation Science Standards, Life Science Disciplinary Core Idea

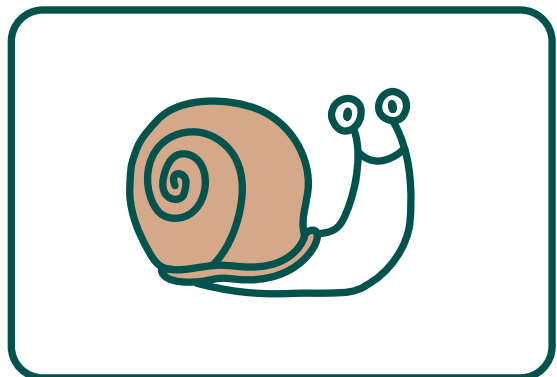
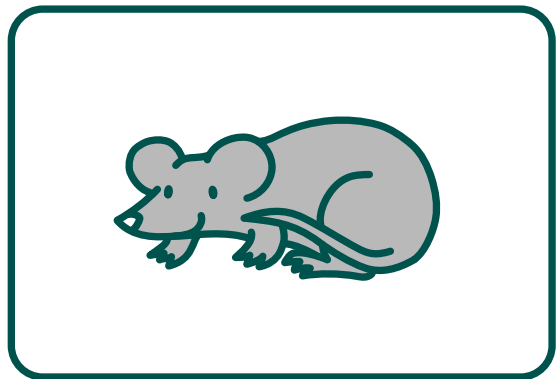
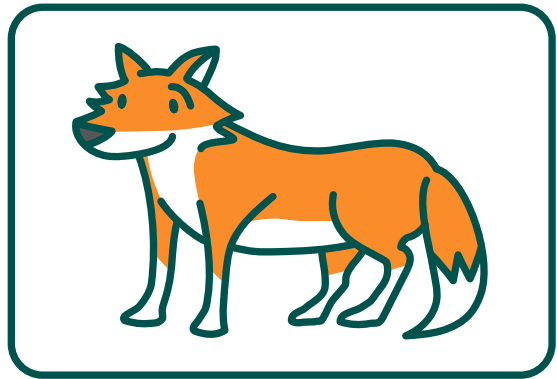
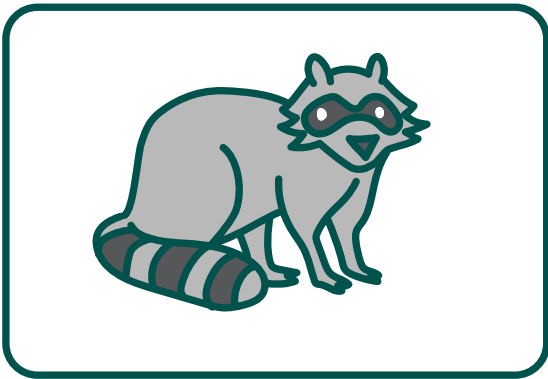
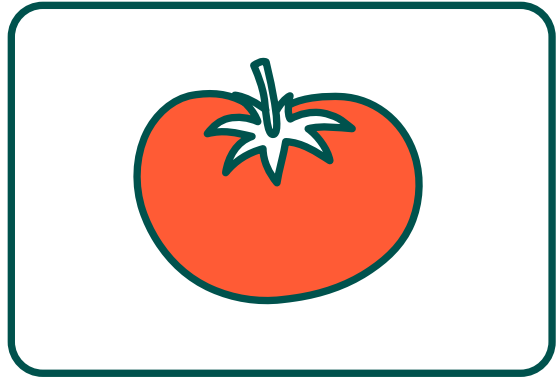
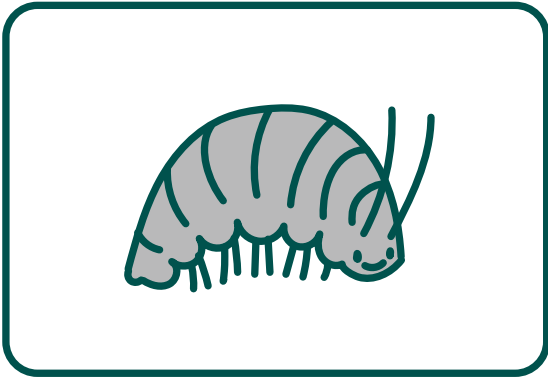
NGSS 5-PS3-1.

Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

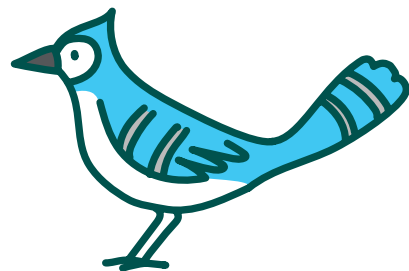
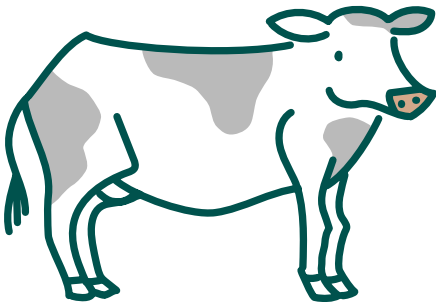
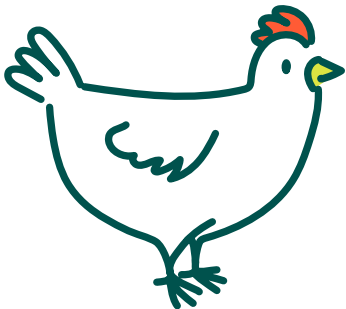
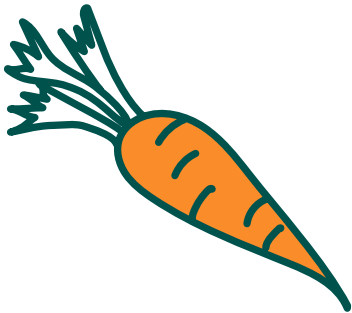
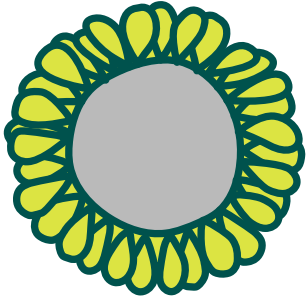
NGSS 5-LS2-1.

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

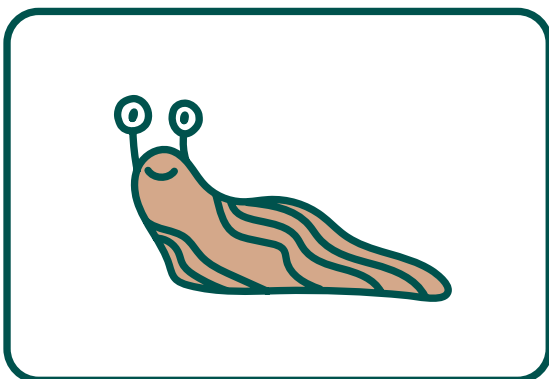
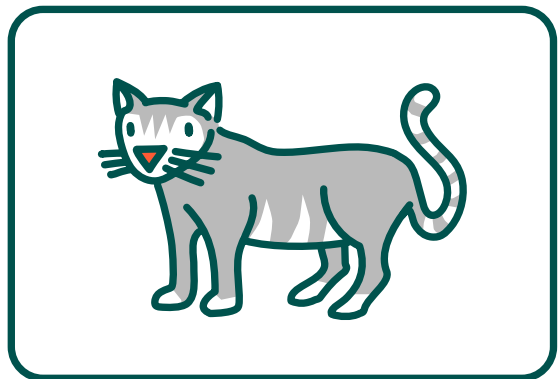
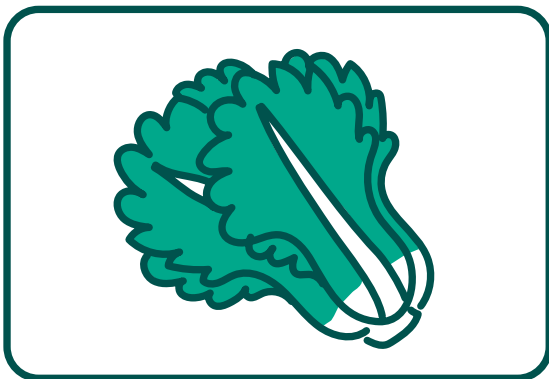
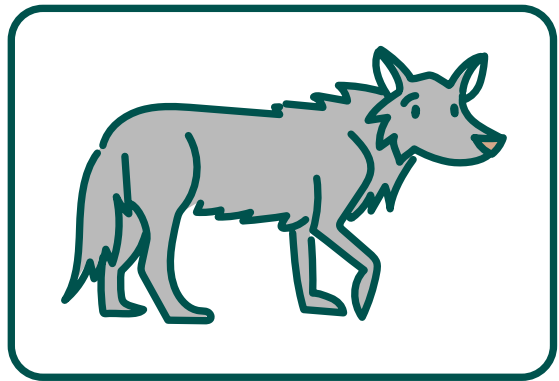
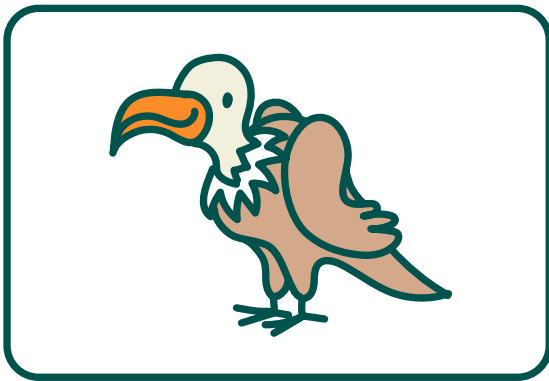
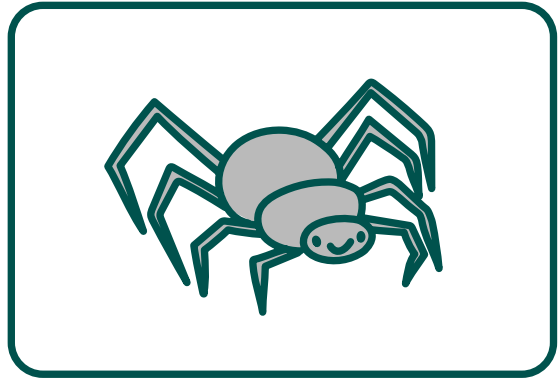
Food Web Role Cards



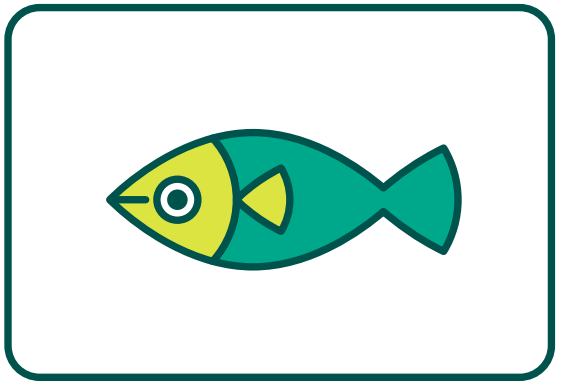
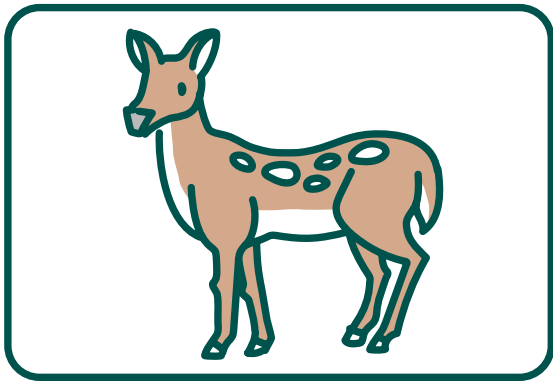
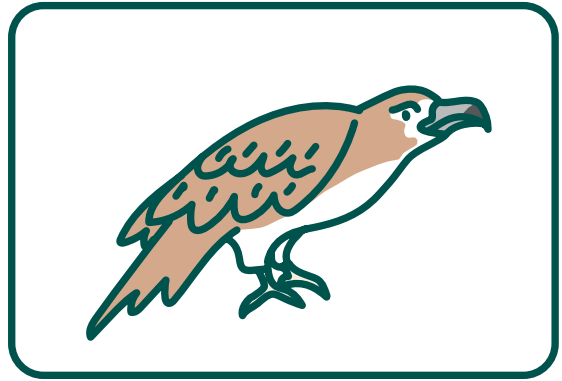
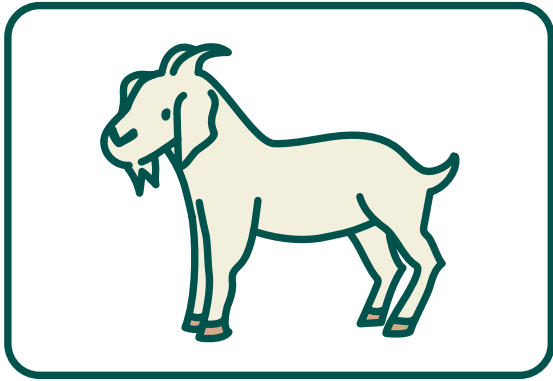
Food Web Role Cards





























Food Web Role Cards



Food Web Role Cards



| PRODUCERS | CONSUMERS | DECOMPOSERS |
|--|--|---|
|  Wheat  Bok Choy  Clover  Carrot  Sunflower  Tomato  Corn |  Deer  Goat  Cat  Chicken  Person  Hawk  Mouse  Raccoon  Coyote  Blue Jay  Cow  Fox  Spider  Vulture |  Worm  Slug  Fungus  Roly Poly  Snail |