Cycle of a Nutrient

THEME: EXPLORING THE ECOLOGY OF FOOD

5TH GRADE
55 MIN.
WINTER

ESSENTIAL QUESTIONS

Where do the nutrients in our food come from?
Where do the nutrients in our food waste go?
Why is composting food waste an important step in the nutrient cycle?

LEARNING OBJECTIVES

✓ Students will be able to explain how the nutrients that nourish us are derived from soil and air.
✓ Students will be able to explain how our food waste can go back into the nutrient cycle in the form of compost to replenish the soil.

LESSON DESCRIPTION

In this lesson, students learn about the nutrient cycle and demonstrate their understanding of the nutrient cycle through a cartoon or narration.

MATERIALS

- ☐ Objects that represent the nutrient cycle, such as an apple, a decaying apple core, a small container of rich garden soil or finished compost, and a small twig
- ☐ Handkerchief or tray
- ☐ Cycle of a Nutrient Cards (p. 536)
- ☐ Cycle of a Nutrient Poster (p. 537)
- ☐ Paper for each student
- ☐ Markers and crayons

PREPARATION

› Photocopy Cycle of a Nutrient Cards, and cut them out; create sets for partners. Set aside all the cards with images of a worm or a human to be passed out separately.

ACTION STEPS

1. Connecting the Dots: Gather students around a handkerchief or tray with objects that represent the nutrient cycle. Make sure that the objects are not in any logical order. For example, you might just have the twig, then the apple core, then the apple, and then the soil in a line. Explain to students, *These objects tell a story. But right now they're not in order! It's your job to figure out the mystery of how to reorder them to tell the story.* Pass out sets of cards (minus the worm and human cards) to pairs of students, and have students work in pairs to figure out the order the cards would go in to tell a story. The goal is to have students recognize that the decaying plant eventually becomes part of the soil, and the nutrients released in the process of decomposition help nourish a new plant. Have students share their story and, as they do, reorder your real objects to reflect the story they're telling (soil to twig to apple to decaying apple). ***(5 min.)***

2. Animals in the Cycle: Pass out a picture of a human to each pair and ask, *How would a human fit into this story?* Pass out a picture of a worm and ask students how it would fit in as well. Call on pairs to share their guesses. Have students fill in the gaps where the first pair leaves off. If students don't mention it, say, *This is a story with no beginning and no end. It is a cycle.* Reorganize the objects into a circle to connect the dead plant to the soil and the soil back to the new plant. ***(5 min.)***

3. Putting it All Together: Display the Cycle of a Nutrient poster. Explain to students, *Nutrients are chemical elements that all plants and animals need to grow. For example, Foods such as bread, tortillas, pasta, and rice all have a nutrient called* carbohydrate *that is a great source of energy. Fruits and vegetables have nutrients called* vitamins and minerals *that help our bodies work well and make us glow. That's where we get the word nutrition from. Nutrients move from our environment into living things. Once those living things die, they decompose, or break down, thanks to the help of decomposers. The process of decomposition releases the nutrients back into the soil, where they're ready to nourish and support new plant life.* Explain to students that the earth is very efficient at recycling waste, but humans often interrupt this cycle by throwing our food scraps into a plastic garbage bag that goes to a landfill. When we compost, we are giving those nutrients from our food waste right back to the soil, which helps us grow new food. ***(10 min.)***

4. A Year in the Life of a Nutrient: Tell students, *I'm giving you the challenge to put yourself in the place of a nutrient! What would your life look like over the course of a year?* Give them the choice between drawing their own cartoon or writing a narrative from the point of view of a nutrient. Have students start by thinking of one of their favorite foods. They will start their cartoon or narrative from the perspective of a nutrient inside an ingredient from that food. Have them include the food growing, part of the food getting eaten and part of it getting composted, the nutrients going back into the soil from composted food, and the new ingredients growing from that soil. For the food that is eaten, students can depict waste being excreted directly back into nature by animals. Circulate through the room, checking in with students and providing support. ***(20 min.)***

5. Sharing: Have small groups of students share their cartoons and narratives with each other. ***(10 min.)***

REFLECTION

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

- *Where do the nutrients we eat originally come from?*
- *What role do decomposers, such as worms, play in the nutrient cycle?*
- *What steps can humans take to play a positive role in the nutrient cycle?*

ADAPTATIONS

Garden: Have students find objects in the garden to represent the various components of the nutrient cycle, and have them put them in order to tell stories.

Physical: Play decomposer tag as an energetic way to reinforce the concept. Have one student

wear an armband indicating that they're "frost" (Death), and have a couple other students wear an armband in a different color, indicating their roles as "worms" (Decomposers). Have all other students be plants. If Death tags a plant, the plant is frozen until a Decomposer tags it, representing the decomposition cycle. Try playing where Death is allowed to tag the Decomposers to show that without decomposers recycling plant matter, there's no new life.

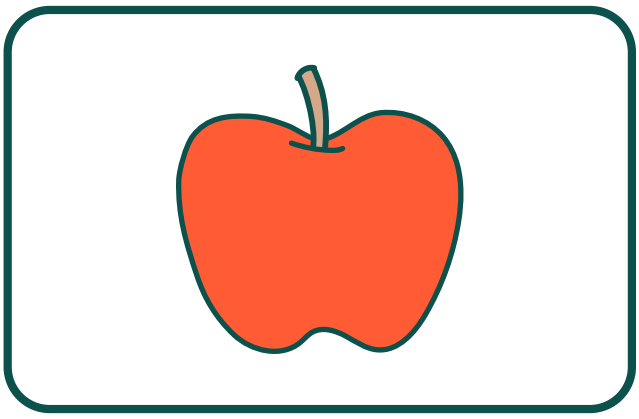
Musical: Teach students the song "Dirt Made My Lunch" by the Banana Slug String Band.

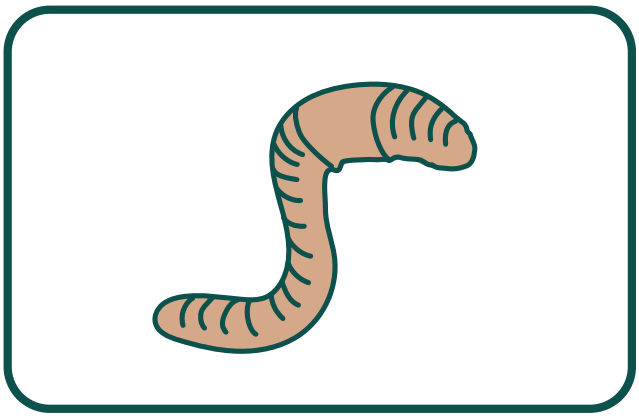
Extension: Have students create their own game to represent the nutrient cycle. You can show them *Caine's Arcade* for inspiration. Provide materials such as cardboard boxes, markers, tape, and marbles, but let students use their own imagination to dream up the game. Have students present how their game represents the nutrient cycle. Then allow students to play each other's games.

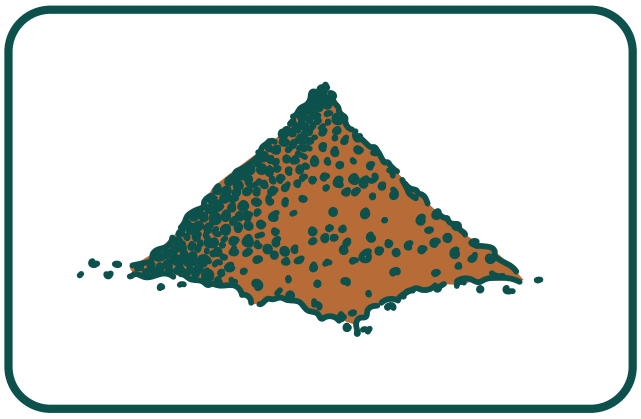
ACADEMIC CONNECTIONS

Next Generation Science Standards
Life Science Disciplinary Core Idea
NGSS.LS.2.A.
The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.

Cycle of a Nutrient Cards







NUTRIENT CYCLE