

Web of Life



OBJECTIVES:

Students will:

1. illustrate the food chain and the role of decomposers in a food web by playing a game of decomposition tag.



STANDARDS: Science



SKILLS: Analysis, classification, description, problem solving



SETTING: Classroom and Outdoors



TIME:

Classroom: 40 minutes
Outdoors: 10 minutes



VOCABULARY:

Carnivores
Consumers
Decomposers
Food chain
Food web
Herbivores
Omnivores
Producers

Introduction

Overview:

In this lesson, students will learn about the food chain of a compost bin by playing a tag game that illustrates the role of decomposers in a food web.

Teacher Background:

Decomposers play an essential role in all food chains. A food chain shows the relationship and sequence of one organism eating another.

Plants produce the food that will be eaten by animals called “herbivores.” These plant-eaters are eaten by other animals called “carnivores.” Dead plants and animals are decomposed by small organisms, including insects and fungi, called “decomposers.” Decomposition frees small molecules of fertilizers that can dissolve in the soil to be taken up by the roots of plants and are essential for the growth and health of plants. The complete food cycle includes decomposers that are very important but often overlooked. Decomposers play an essential role in completing the food cycle. Without decomposers, the world would be covered in stuff. Decomposers are essential to any food chain because they recycle nutrients to be used again by producers and consumers.



Materials:

Students:

- Two red paper armbands
- Four blue paper armbands
- Four white paper armbands (armbands can also be made from any reused material)

Teacher:

- “Food Chain in a Worm Bin” overhead
- Rubric overhead
- Rubrics (one per student)

Preparation:

Make two red, four blue and four white armbands out of cloth or paper.



ACTIVITY

Discussion

1. Define and explain the concept of a food chain. For example, a simple food chain usually starts with green plants that provide food for animals that eat plants, which provide food for animals like carnivores that eat other animals. A food chain demonstrates the transfer of energy between plants and animals. Usually a food chain does not show the actual food web that includes the decomposers.
 2. Decomposers play an important role in the food chain because they recycle materials back into living systems by breaking down biodegradable materials into rich compost. Without decomposers the cycle of life could not continue.
 3. Introduce the concept of a food web. For example, a food chain consists of four or five links, and each link provides food for the next (draw this on the board or overhead). A food web is made up of interconnected food chains. Many animals are part of more than one food chain because they eat more than one type of food. Ask students to share some examples of animals or insects that eat more than one kind of food.
 4. Show the overhead "Food Chain in a Worm Bin" and discuss the role of decomposers in a worm bin (refer to "Compost Critter Information Pages" in Lesson 20).
 5. Model for the students how to make a food chain using examples of decomposers shown on the "Food Chain in a Worm Bin" overhead. For example, dead organic matter is eaten by worms that are eaten by centipedes.
 6. Explain that students will learn more about the role of decomposers in a food web by playing a walking game of decomposition tag.
 7. Show an overhead of the lesson rubric, and review the expectations for this lesson.
2. Assign four students to play the role of second-level consumers which are eaten by third-level consumers. Second-level consumers may include springtails and mold mites. Give these students blue armbands to wear.
 3. Assign four students to play the role of first-level consumers, which are eaten by second-level consumers. First-level consumers may include slugs, millipedes, sow bugs, worms, etc. Give these students white armbands to wear.
 4. Assign the remaining students to be producers, which are eaten by first- and second-level consumers. Producers may include plants or food scraps commonly placed in a worm compost bin.
 5. When the game begins, the students assigned to be consumers should try to tag other students who represent food they would eat. For example, a student assigned to be a spider would tag a worm or millipede. A student assigned to be a worm might tag a food scrap. Use the overhead to demonstrate the different levels of consumers.
 6. When a student is tagged, they must freeze in place. This signifies that they have been consumed.
 7. Start and stop the game as necessary. There is no natural end. Let the participants play long enough to experience the concept that without decomposers, to recycle dead organic matter the food web would not be complete. Stop the game well before students get exhausted or lose interest.

Procedure

Decomposition tag:

1. Clearly explain the directions and rules of the game, assign students to roles and define the boundaries for the area used for the game.

Tag game directions and rules:

1. Assign two students to play the role of third-level consumers, which are highest on the food chain. For example, third-level consumers in a worm bin may include centipedes, spiders, or ants. Give these students red armbands to wear.

Wrap-Up

1. Ask the students to explain what happened in the game and describe the important role of decomposers in a worm bin food chain.
2. Ask the students to predict what would happen if the world did not have decomposers.

Final Assessment Idea

Have students create their own food chain using examples of producers and consumers from the teacher overhead "Food Chain in a Worm Bin." This should include a producer and first-, second-, and third-level consumers.



RESOURCES

Extensions:

Ask students to create a diagram showing a food chain in a worm bin using drawings or pictures to represent each organism. Have them also state how energy is passed from one organism to the next.

Teacher Materials:

California State Content Standards

The standards below represent broad academic concepts. This lesson provides connections to these academic concepts through hands-on activities and exploration. This lesson is not designed for a student to master the concepts presented in the standards. Additional lessons in the classroom that build on this lesson or the standard(s) ensure that students will have the opportunity to master these concepts.

SCIENCE	CONTENT STANDARDS
Grade 4	Life Science 2.a. Students know plants are the primary source of matter and energy entering most food chains. 2.b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem. 2.c. Students know decomposers, including many fungi, insects, and micro-organisms, recycle matter from dead plants and animals.
Grade 5	Life Science 2.a. Students know many multicellular organisms have specialized structures to support the transport of materials.





Web of Life Rubric

A rubric is a scoring tool that defines the criteria by which a student's work will be evaluated. This rubric is provided to assist you in setting expectations for students and assessing their performance and engagement during the lesson based on specific tasks. Ideally, a rubric is developed with the cooperation of the students. Two blank rows have been provided for you and your class to develop and add your own assessment criteria.

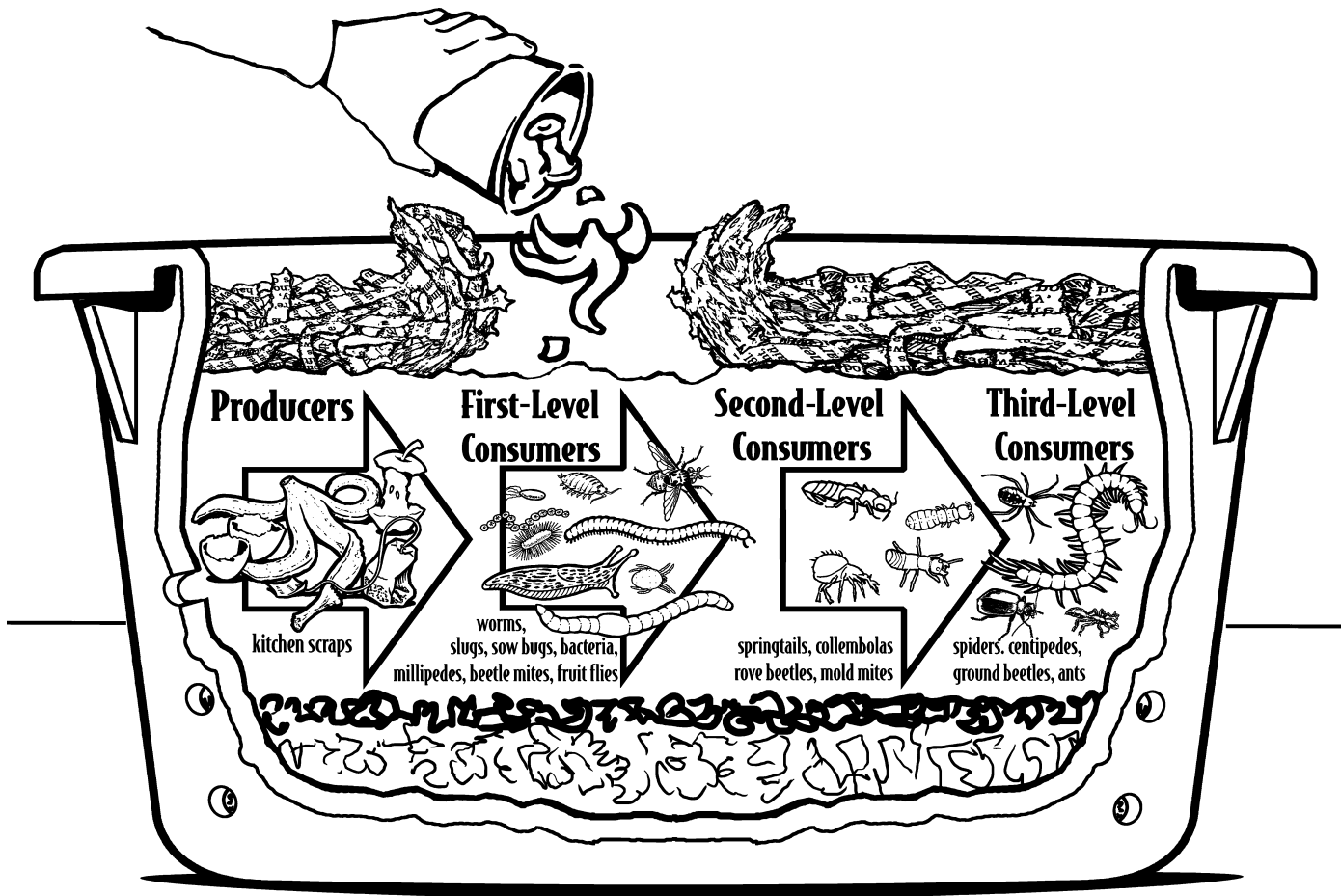
CATEGORY	4	3	2	1
Participates in the game	Student performs well in assigned role.	Student performs assigned role with some difficulty.	Student is not able to perform assigned role without help.	Student fails to participate in the game.
Describes a food chain	Student writes out a food chain correctly showing various components including producers, first-, second-, and third-level consumers.	Student misses one level of the food chain.	Student misses several levels of the food chain.	Student does not do the assignment.





Teacher

Food Chain in a Worm Bin



DEFINITIONS

Vocabulary:

Carnivores: animals that eat other animals.

Consumers: animals that get their food from other living things, plants or animals.

Decomposers: an organism, including fungi, bacteria and invertebrates, that breaks down organic waste.

Food chain: the sequence of one organism eating another organism. An example of a food chain is the following: green plants (using sunlight to grow) are eaten by sheep, which are eaten by wolves, which die and are eaten by decomposers, which free fertilizing material into the soil, which is needed by the plants to grow.

Food web: many food chains that are interconnected.

Herbivores: animals that eat plants.

Omnivores: animals that eat both plants and animals.

Producers: plants that make their own food using energy from the sun.

