Coding a Food Chain	Grade 4, Habitats and Communities

Lesson Plan

Description
In this lesson, students will use their newly learned knowledge about food chains to code a food chain game using Scratch.
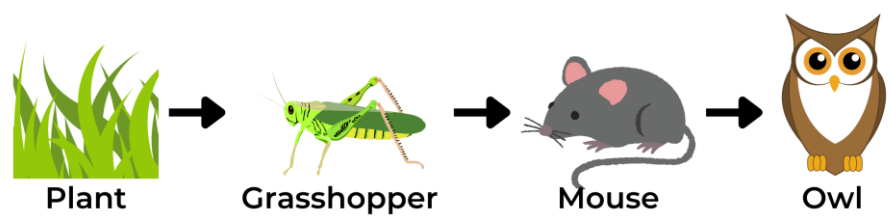
Learning Outcomes
- Describe the difference between a food chain and a food web.
- Explain what producers, consumers, and decomposers are.
- Describe the differences between a primary consumer, secondary consumer, and tertiary consumer.
- Define omnivore, herbivore, and carnivore.

Specific Expectations
B2.3 Describe the relationship of organisms in a food chain, and classify organisms as producers, consumers, and decomposers.

B2.5 Describe how animals are categorized according to their diet, and categorize various animals as carnivores, herbivores, and omnivores.

Introduction
Every living thing needs energy in order to survive; including plants. This energy comes from food. Humans need food to survive so we eat plants and animals. The animals we eat also need food to survive, so they eat plants, animals, and/or insects. This is called a **food chain**, which is a natural sequence that tells us who eats what. Grass gets eaten by cows and then humans eat the cows. In the example below, the plant gets eaten by a grasshopper. The grasshopper gets eaten by a mouse. The mouse gets eaten by an owl.

Plant → Grasshopper → Mouse → Owl

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However, just like you don't eat the same meal for dinner every night, animals don't either. Mice sometimes eat different insects than grasshoppers, and owls might eat shrews or snakes instead. This is called a food web. A **food web** is all the food chains that exist in an ecosystem. An owl's food web could look like this:
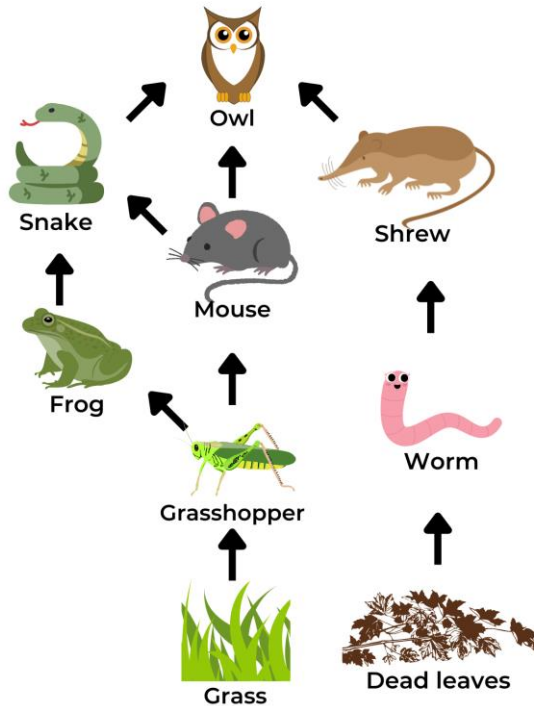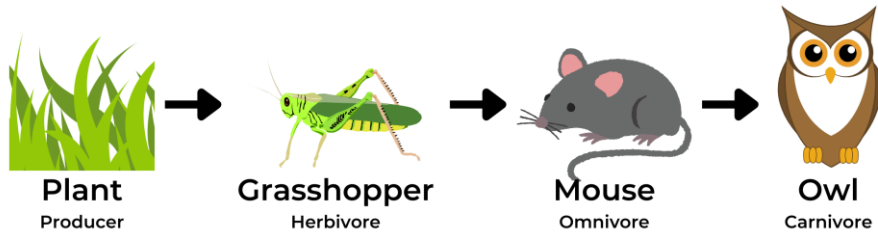

In the food chain, there are producers, consumers, and decomposers. A **producer** is an animal that produces food for itself and others. Plants are producers because they make their own food using sunlight and are food for other living organisms. A **consumer** is dependent on producers or other consumers for food. All animals are consumers. A **decomposer** helps to get rid of dead matter by feeding on it. Fungi, earthworms, and termites are all decomposers.

Animals have different diets. A consumer is either an omnivore, an herbivore, or a carnivore. An **omnivore** is a mammal that eats both plants and meat. However, not all animals eat both. Some mammals only eat plants (**herbivore)**, and some mammals only eat meat (**carnivore).**

Most humans eat both plants and meat; meaning they're omnivores. Some animals that are omnivores are seagulls, ducks, and bears. Elephants, rabbits, and horses are examples of herbivores. Lions, spiders, and owls are all carnivores.

In the below example, the plant is a producer. The grasshopper is an herbivore. The mouse is an omnivore. The owl is a carnivore.

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There are different types of consumers; primary, secondary, and tertiary. A **primary consumer** is a herbivore that feeds on plants. They are the second organism in a food chain, after the producer. A **secondary consumer** is either a carnivore or omnivore because they eat the primary consumers. Similar to a secondary consumer, a **tertiary consumer** is either a carnivore or omnivore that eats secondary consumers.
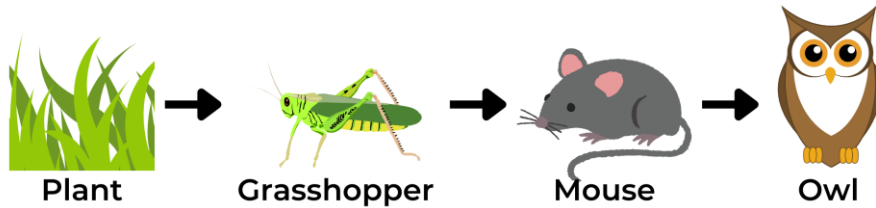
In the following example, the plant remains the producer. The grasshopper is the primary consumer. The mouse is the secondary consumer. The owl is the tertiary consumer.
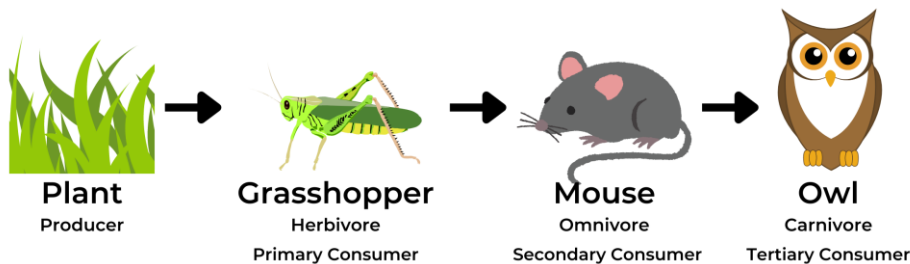
Action

What is coding? **Coding**, simply said, is a set of steps or instructions. We use coding in our everyday lives. Traffic lights, video games, or elevators all need coding in order to work.

We are going to use coding to help the animals in the food chain below to find their food. In order to do this, we're going to use scratch. Scratch is a block-based coding platform.

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Plant → Grasshopper → Mouse → Owl

Here's a link to the completed project: https://scratch.mit.edu/projects/766440383

How the game works: In this game there are four sprites moving around the screen. The goal of the game is to have the sprites eat the correct food in the food chain. When the correct consumer is over its food, press the space button. The plant gets eaten by the grasshopper. The grasshopper gets eaten by the mouse. The mouse gets eaten by the owl. They must be eaten in this order. Once all consumers have eaten their energy, you win!

See Coding Handout for step-by-step instructions on how create this game with your students.

Consolidation/Extension

For an extension of this activity, students can add lives to the game to make it more challenging. After adding lives, when student press the space key when the sprite is touching nothing, they will lose a life. This is more challenging because they can't continue to press the space key in order to win. This adds a "Game Over" option. This will require some adjustments for each of the codes.

Here's a link to the completed project: https://scratch.mit.edu/projects/769766788

See Coding Handout: Extension for to find steps on how to add lives to the game.

Accommodations/Modifications

See Coding Handout: Accommodation for an iPad friendly coding handout for this game.

Here's a link to the completed project:
https://scratch.mit.edu/projects/769947554

Assessment

Gather information from the students throughout the activity to gauge their level of understanding as a form of Assessment *of* Learning.

Additional Resources

https://youtu.be/xvW4Cg-1g4U

https://youtu.be/CZhE2p46vJk

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