This Is the Sun
Teacher's Guide

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To be used with
This Is the Sun
Written by Elizabeth Everett
Illustrations by Evelline Andrya

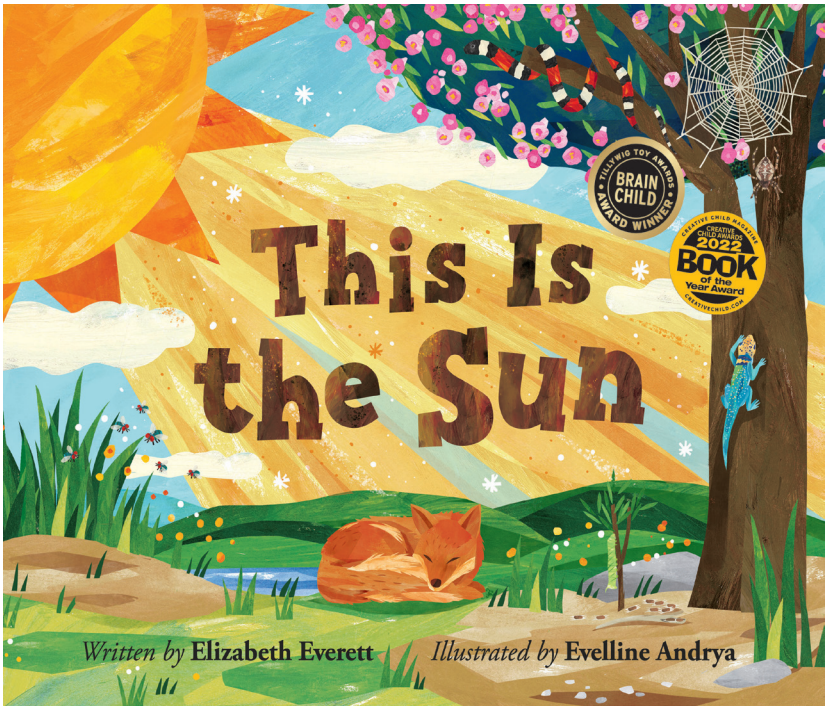

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Table of Contents

Introduction

The Sun is the reason why humanity and life as we know it exists. Earth revolves around the Sun. Thanks to the Sun's energy, light, and gravitational pull, life thrives on our planet. Through sunlight and its warmth, plants can grow and release oxygen for us to breathe. The Sun's heat maintains the Earth's temperature and keeps us from freezing. The Earth's relationship with the Sun is the reason we can tell the passage of time and understand the seasons.

When it comes to the formation of the food chain and life cycles, the Sun plays an integral role in providing energy for all living organisms on the planet. The Sun feeds the plants, and the plants feed the animals, and the animals feed other animals, and, eventually, the decomposers break them all down to provide nutrients for the ground where the plants can grow. Then the food chain starts all over again. When a member of the food chain disappears from an ecosystem, it causes an imbalance that can affect other plants and animals. But, if the Sun were to disappear, the food chain would cease to exist altogether. This is how important the Sun is to all living things; we cannot survive without it.

In this Teacher's Guide, we highlight the Sun's fundamental role in the food chain. Through the activities and experiments offered here, young inquisitive minds will be able to understand the systems that naturally occur in nature and will explore their own scientific research and hypotheses.

Resources

Videos to watch:

Food Webs & Food Chains for Kids | Fun Lesson for Grades 3-5 | Science
Fabulous Food Chains: Crash Course Kids #7.1
How the Sun affects the Earth | Science videos for kids | Kids Academy

Books to read:

The Sun: Our Nearest Star by Franklyn Branley
Energy From the Sun by Allan Fowler
Pond Circle by Betsy Franco
Trout Are Made of Trees by April Pulley Sayre

Websites to interact with:

https://www.generationgenius.com/food-webs-reading-material/
https://www.sheppardsoftware.com/science/animals/games/food-chain/
https://www.ducksters.com/science/ecosystems/food_chain_and_web.php

About the Author

Elizabeth Everett spent 16 years as a classroom teacher before venturing into writing. Inspired by her energetic youngster, Jalen, and his love for books, she took her background in education and meshed it with his childhood interests. The result was edu-tainment in the form of children's books! She currently lives in Colorado with her family where they love spending time outdoors in the Western sun. This is her first children's book and she is excited to have several more coming out soon. She can be reached at Elizabeth.Everett@ScienceNaturally.com.

About the Illustrator

Evelline Andrya was born in Sumatra, Indonesia. She grew up with both Chinese and Javanese cultures. Her passion in illustration started at a very young age. She was influenced by vintage greeting cards that she found in her grandma's drawer, comic books, antique picture books, and animated movies. Her illustration style is a mix of traditional medium and digital collage. She lives in Jakarta with her husband and three children. Find her on Instagram @evellineandrya.

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Pre-Reading: Discussion

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*

Subject: Food Pyramid

NGSS: K-PS3 Energy & K-LS1-1 From Molecules to Organisms: Structures and Processes

Skills: inference, critical thinking

Background: *This Is the Sun* teaches us all about the circle of life. Every part of the Earth, from the tiniest plant to the most ferocious predator, is connected. It's important to know where the food we eat comes from.

Activity: Ask your students to discuss the following questions.

- What do you know about the Sun?
- How do you think the Sun affects life?
- What do you like to eat?
- Do you eat more plants or animals?
- Where do you buy your food? Do you like to shop at grocery stores, farmers markets, or somewhere else?
- Have you ever worked in a garden? How do you think plants grow?

If you are doing this activity with older students, take them on a walk outside, and point out the Sun, the plants, animals, and other signs of life you see while asking questions.

Discussion: Students should begin to think about the processes that lead to their own food, and about the importance of the Sun. Ask your students to discuss the way the food they eat is connected to the circle of life, beginning with the Sun. Encourage new connections to be made through bringing up the animals that rely on plants, the plants that rely on bees, and more.

While You Read: Act It Out!

Grades: Kindergarten–2nd Grade

Materials: *This Is the Sun*, Act It Out! Images, popsicle sticks, glue

Subject: Food Chain

NGSS: K-LS1-1, From Molecules to Organisms: Structures and Processes

Skills: active listening, working with others

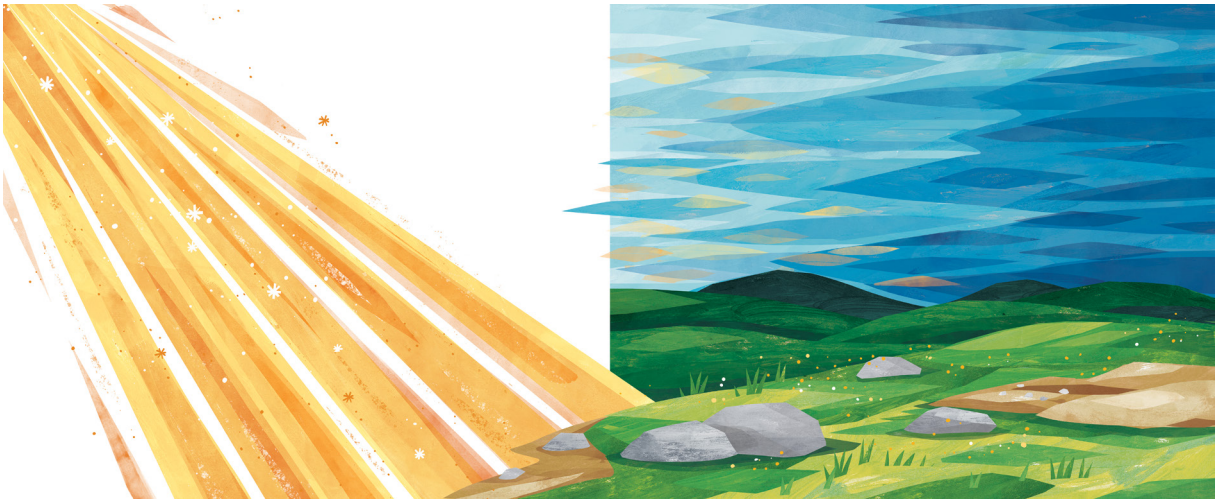
Background: The food chain shows us how energy is created and transferred between living organisms. From the smallest plant to the biggest lion, every living things plays an integral role in the food chain. Without one part of the food chain, the rest of the chain would not function properly. In reading *This Is the Sun* and acting out each role of the food chain, we can learn that we have to depend on one another to survive!

Activity:

1. Print out the images from the book (see pages 9–19), and cut them them out.
2. Glue a popsicle stick to the back of the image so that your students can hold the popsicle stick to show an image.
3. Assign a student or a group of students (depending on your classroom size) an image. There should be 12 groups/students to correspond with the 12 images. If there are fewer students, some students can be in charge of two images.
4. As you read *This Is the Sun* aloud to your students, have them raise their images and act out what is happening when they see the corresponding part of the story.

Discussion: How are plants and animals dependent on each other? How did you see the energy flow from one thing to another? Where do you think humans fit on this food chain? What would happen if you removed an animal from the food chain? What about a plant?

Act It Out! Images



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Activity: Create a Food Circle

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*, Food Circle worksheets, scissors, glue

Subject: Food Chains

NGSS: K-PS3 Energy & 2-LS2-2 Ecosystems: Interactions, Energy, and Dynamics & K-ESS3-1 Earth and Human Activity

Skills: identifying, organizing, critical thinking

Background: In *This Is the Sun*, children are introduced to food chains, which all rely on the Sun. The Sun gives energy to plants, which in turn gives energy to animals, who eventually pass waste that provides nutrients to the earth and helps more plants grow, and so on. Food chains/webs are hardly ever completely linear, so this activity will help them visualize how the Sun supports all living things.

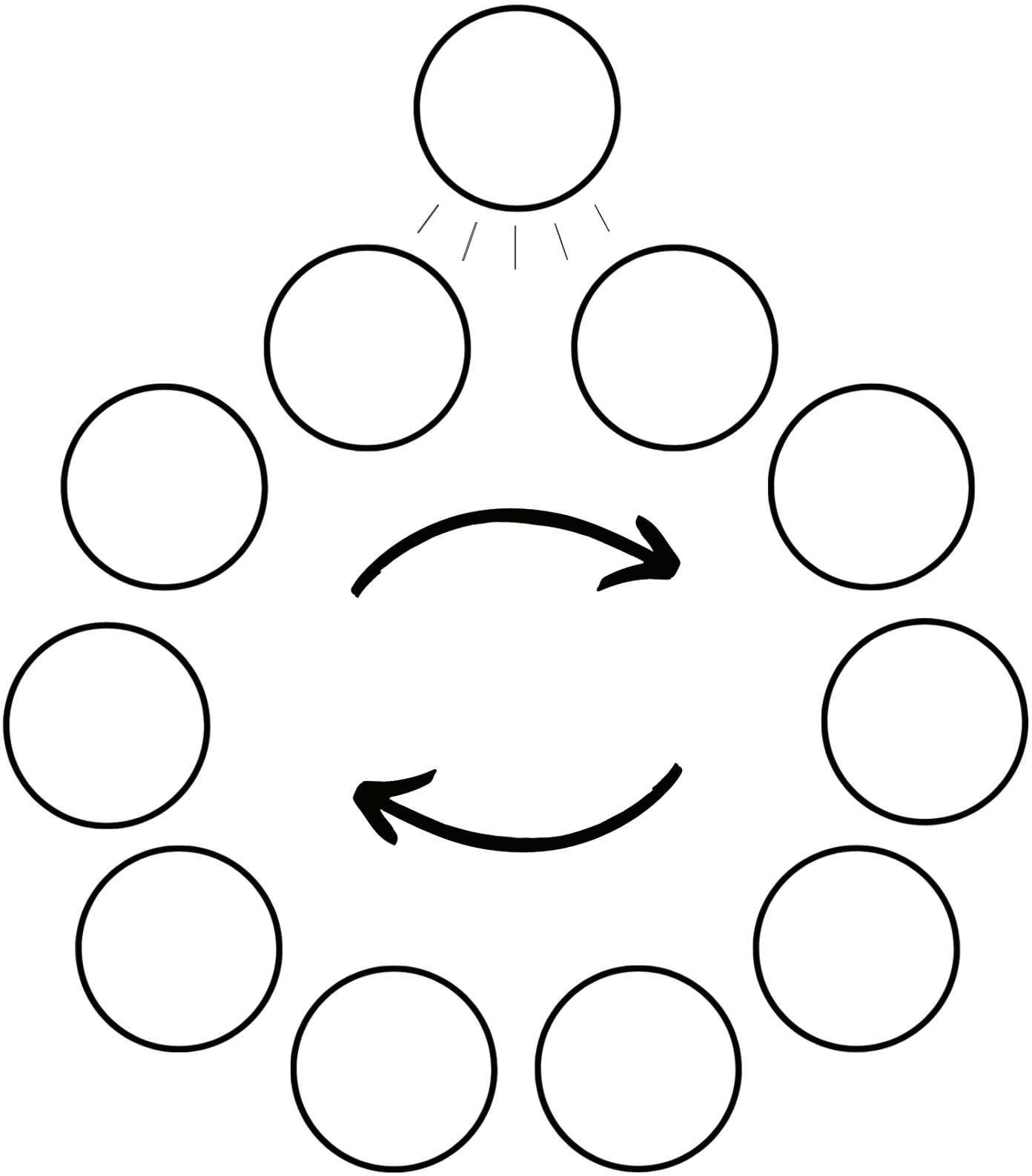
Activity:

1. Read *This Is the Sun* to your class.
2. Print out enough Food Circle worksheets and Food Circle Images for your entire class. Depending on the age of your students, you may want to cut out the pictures for them.
3. Distribute the worksheets and images to your class. Ask them to glue the pictures in order, with the Sun at the top of the circle. They can refer back to *This Is the Sun* if they need to.

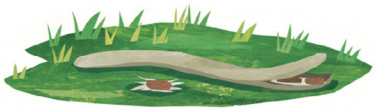
Discussion: Ask your students if any part of the circle surprised them. Did they need to check *This Is the Sun*, or could they make the circle on their own? Where do they think humans would fit in the food circle? Why do they think the Sun is separated from the circle, but still included? Each living thing in the circle helps the next thing grow, but does anything in the food circle provide energy for the Sun?

Food Circle

Name _____ Date _____



Food Circle Images



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Activity: Inference

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*

Subject: Food chains

NGSS: K-ESS3-1 Earth and Human Activity & K-LS1-1 From Molecules to Organisms: Structures and Processes & 2-LS4-1 Biological Evolution: Unity and Diversity

Skills: research, inference, critical thinking, leadership

Background: *This Is the Sun* is an example of one kind of food chain occuring in one specific environment. The living things that appear in the book are, in order: a desert willow tree, an eastern tiger swallowtail caterpillar, an orb weaver spider, an eastern collared lizard (male), and a red fox. All of these animals interact with each other in the same habitat (the southwestern United States). But the Sun is the focal point of different food chains in many different biomes. For example, in mountainous regions, the Sun causes berry plants to grow, which are eaten by bears, which then feed the bacteria living in the bear's intestines.

Activity:

1. If you are working with younger students, ask them to brainstorm examples of other food chains, made up of at least three living things. Ask them to name plants and animals that they interact with on a daily basis and to think about what they eat and what eats them.
2. If your classroom is made up of older students, ask them to research more detailed examples of other food chains using online resources. Depending on the class size, children can work individually or in small groups. Students can choose from the following habitats: rainforest, farm, jungle, mountain, sea, plains, and bush.

Discussion: Have your students present their food chains to the class, letting them practice leading discussions on their own. Encourage students to ask questions and to think about other organisms that might be a part of the other students' food chains.

Activity: Classifying Members of the Ecosystem

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*, Classifying Organisms Worksheet

Subject: Food Chains

NGSS: K-LS1-1 From Molecules to Organisms: Structures and Processes

Skills: inference, identifying

Background: Even scat has its role to play in maintaining a healthy food chain. Worms, bacteria, and fungi are called **decomposers** because they feed on scat and allow those nutrients to be used by plants. Plants are called **producers** because they generate their own energy directly from the Sun. Animals like the bug, spider, lizard, snake, and fox are all **consumers**, because they get their energy by eating something else.

Animals that only eat other animals, like the snake, are called **carnivores**. Animals that only eat plants, like the bug, are called **herbivores**. Animals that eat plants and other animals, like the lizard, are called **omnivores**.

Activity:

1. Go over the background information with your students.
2. Pass out the Classifying Organisms worksheet, which will instruct students to match some of the organisms from the story with the appropriate kind of consumer.
3. Encourage students to ask questions or use online resources if they need help.

Discussion: Ask your students if they were surprised by any of the animals' classifications. What differences do they notice between herbivores and carnivores? If you have already done the activity on page 11, ask the students how they would classify the animals they used in their own food chains. How would they classify themselves?

Classifying Organisms

Name _____ Date _____

Draw a line between each animal and the correct label.

Omnivore

Herbivore

Carnivore

Activity: Grow and Learn Part 1

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*, bean seeds, two small plastic cups, water, potting soil, grow light (optional)

Subject: Photosynthesis

NGSS: 2-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Skills: observation, analysis, critical thinking

Background: Plants need water and light to grow. They convert these things into energy through a process called photosynthesis. This experiment will show your students exactly what happens to a plant when it doesn't get enough light from the Sun.

Activity:

1. Read *This Is the Sun* with your class, and talk about how the sunlight provides energy for the tree.
2. Fill each cup with soil.
3. Plant one bean seed in each cup. Make sure you gently cover each seed with a shallow layer of soil.
4. Place one of the cups in a spot that receives lots of sunshine. If the weather is too stormy or overcast, position the pots under a grow light.
5. Place the remaining cup in a dark spot of the classroom.
6. Water your seeds. Make sure you're giving each plant the same amount of water.
7. Now it's time to wait. To get the best results, you'll want to observe your seeds for at least three weeks. Water the plants once daily for the first week, and once every three days after that.
8. At the end of each week, take a close look at each of your cups.
9. Once a full three weeks have passed, observe the difference between the two plants.

Discussion: Ask your students to think about what they learned about plants and light. Why do they think plants might need light? Did the absence of light make a difference?

Information adapted from: https://www.education.com/science-fair/article/plants-and-light/

Activity: Grow and Learn Part 2

Grades: Preschool–2nd Grade

Materials: Tomato seeds, small plastic cups, water, potting soil

Subject: Photosynthesis

NGSS: K-PS3 Energy & 2-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Skills: Observation, analysis, critical thinking

Background: As discovered in Grow and Compare Part 1, plants need sunlight to grow. Plants outside in an open area may receive sunlight from all around, but plants inside or in shady areas have more limited options. This experiment will show your students just how much plants rely on the Sun, and how they can adapt to survive.

Activity:

1. After completing Part 1, discuss how much plants need sunlight to survive. Ask your students if they think there is anything a plant can do to get more sunlight.
2. Fill one plastic cup with soil. You may also fill a few back-up cups.
3. Plant a tomato seed in each cup. Make sure you gently cover each seed with a shallow layer of soil.
4. Place the pots somewhere *partially* exposed to sunlight. Part of each pot should be in the shade.
5. Water your seeds.
6. Now it's time to wait. Water the plants once daily for the first week, and once every two or three days after that.
7. When the seeds have sprouted, mark the side of the pot the leaves are leaning toward.
8. Rotate the pot every three days. Each time, ask your students to mark which way the plant has turned. Do this two or three times.

Discussion: Why do they think the plant moved? Can they imagine this on a larger scale? How might this affect a forest or a garden?

Information adapted from: https://www.mamasmiles.com/science-for-littles-plants-and-sunlight/

Activity: Make Your Own Food Chain

Grades: Preschool–2nd Grade

Materials: *This Is the Sun*, Food Chain Links worksheet, Write Your Own worksheet, markers, scissors, glue

Subject: Food Chains

NGSS: 2-LS2-2 Ecosystems: Interactions, Energy, and Dynamics & K-LS1-1 From Molecules to Organisms: Structures and Processes & K-ESS2-2 Earth's Systems

Skills: critical thinking, research, organization

Background: Of course, the ecosystem of plants and animals goes far beyond the simple food chain presented in *This Is the Sun*. In fact, food chain is not an entirely accurate descriptor, because food systems are not linear at all. This activity will help your students visualize the role the Sun plays in generating energy, and will introduce the idea of food webs. For example, some organisms eat seeds before they ever turn into flowers, and animals like possums or birds may also eat lizards.

Activity:

1. Read *This Is the Sun* to your class.
2. Print out enough Food Chain Links and Write Your Own worksheets for each student.
3. Have your students cut out each strip and lay them out in the order of the food chain. Depending on how much time you have, students can decorate each strip. Glue the first link (the Sun) in the shape of a ring. Then glue the tree link around the Sun, and so on, with the remaining strips of paper. The result will be a chain that ends with the seed.
4. For younger students, decide as a class which additional animals might branch off the other links. A squirrel might eat the seed, a frog might eat the spider, worms might eat the scat, a bird might eat the snake, etc. If your students are older, you can have them come up with additional food chain links on their own, to present to the class.

Discussion: Is it easier to understand how ecosystems work in the form of a chain or a web? Which is more realistic? What would happen to the food web if any organism was removed? How does energy get transferred?

Information adapted from: https://rainydaymum.co.uk/secrets-garden-food-chain-activity/

Food Chain Links

Sun

Seed

Scat

Snake

Fox

Flower

Bug

Spider

Tree

Lizard

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Food Chain Links

Write Your Own!

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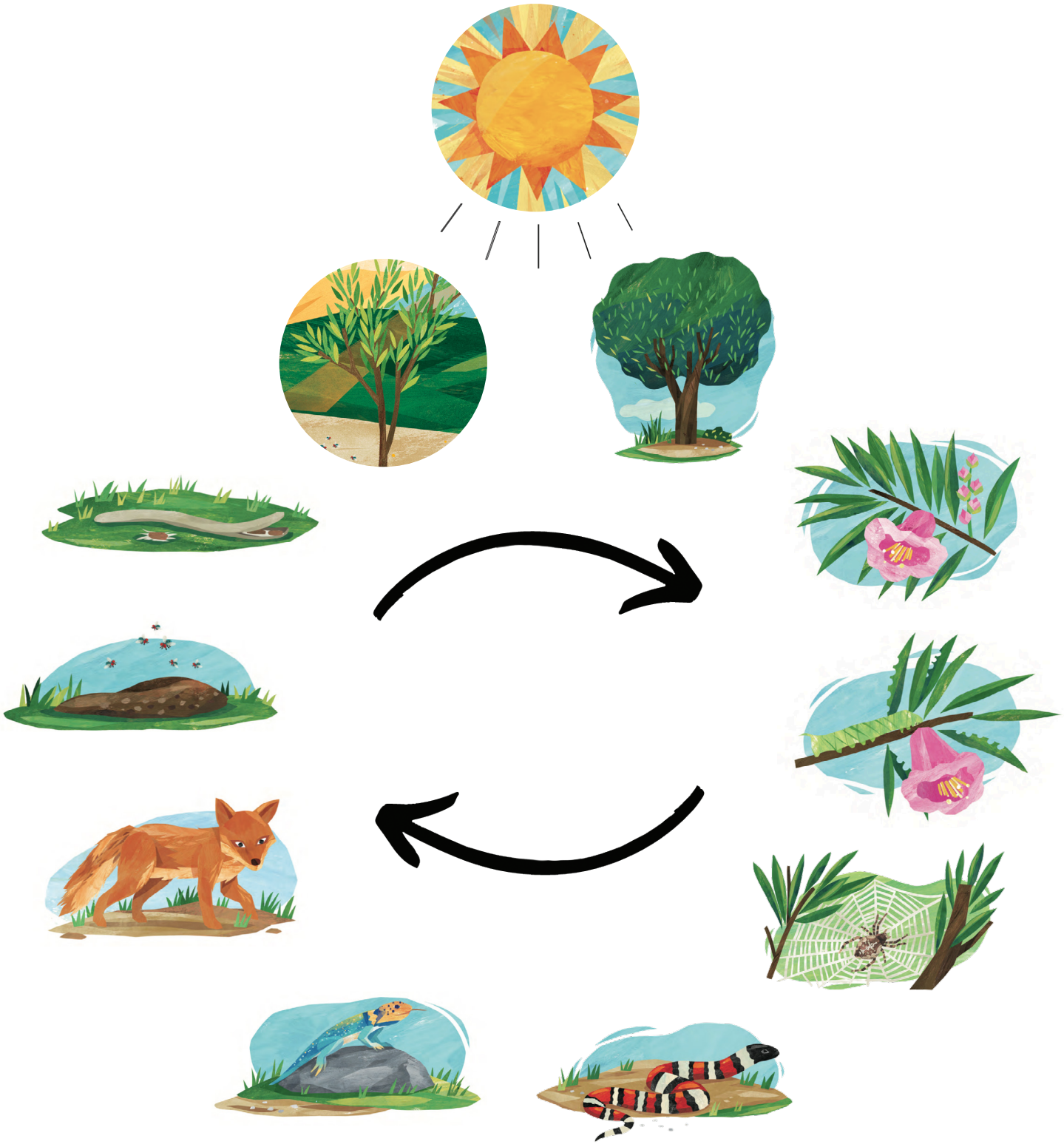
Food Circle Answer Key



Classifying Organisms
Answer Key

Omnivore

Herbivore

Carnivore

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