

3. Food Chains: The Sun Powers All!

Source: Adapted from *Earth Child: Games, Stories, Activities, Experiments & Ideas About Living Lightly on Planet Earth*. See Resources.

Description

Through acting and singing the students will understand the connections between the components of a food chain and realize that all energy originates with the sun.

Background Information

Energy comes from the sun. Wind, solar, oil and food energy all originate from the sun and are converted into usable forms by nature and technology. Food chains are a simple way to connect the movement of energy from the sun to ourselves. Each chain begins with the sun, followed by *producers* - plants that can produce food energy from the sun's energy. The next step in all food chains is *consumers* that consume producers to obtain energy, and then finally *decomposers* that feed on the decaying matter of plants and animals to obtain energy.



Food chains can be used to understand how energy flows through ecosystems and how species are dependent upon each other in those systems. If these chains are disrupted or unhealthy as a result of environmental degradation, the effects are felt all along the chain. Food chains are only as strong as their weakest link and human actions, through consumption and pollution, often threaten these weak links.

Materials

- ▶ one copy of “We Are Sun-Powered” from *Earth Child* (see below)
- ▶ one copy of lyrics to “The Sun Powers All” (see below)
- ▶ music for “The Farmer in the Dell” (optional)
- ▶ 2 sets of name tags representing steps in the food chain as spelled out in the song (sun, plant, insect, animal, meat eater) to hang around students’ necks (Appendix C)

Time Allotment

Introduction: 5 minutes

“We Are Sun-Powered” movement exercise and discussion: 10 minutes

Song and food chain: 20 minutes

Discussion: 5 minutes

Teaching/Learning Strategies

1. Ask students to stand in a circle and make their favourite movement for 30 seconds while staying in their spot within the circle. What power source makes that movement possible? Have class offer suggestions.
2. It is the sun! Ask class to try to figure out how the sun provides the energy for them to make their favourite movement.
3. Introduce the first activity that will explain how the sun provides them with energy.
4. Have the students spread out, to ensure that they have room to move freely.
5. Read “We Are Sun-Powered!” to the students as they silently act out what you are reading.
6. Following the story ask the students to sum up and discuss the path the sunlight took. Describe this path as a food chain.
7. Ask the students to make a circle again to learn a new song about food chains called “The Sun Powers All.”
8. Choose two students to be the sun and ask them to stand in the middle of the circle (hang sun name tags around their necks). Sing the first verse as the children move in a circle around the ‘sun.’
9. Before the second verse the ‘suns’ should choose one classmate each to be ‘plants.’ The ‘plants’ will join hands with the sun who chooses them (see sequence listed below) and be given name tags to hang around their necks (forming a chain of students holding hands).
10. During the successive verses the child on the end of the food chain selects another child from the circle to join the food chain (as would happen in “The Farmer in the Dell”; you will have 10 students wearing tags in the middle of the circle).
Meat Eater – Animal – Insect – Plant – SUN/SUN – Plant – Insect – Animal – Meat Eater
11. When you have finished the game, take a roll call of the food chain created, asking each child to identify which plant, insect or animal he or she is pretending to be.
12. Then ask students to brainstorm (individually, in pairs or as a group depending on timing and comprehension) the food chain that describes the breakfast they had that morning.

Follow-up Discussion Questions

- What is an example of a food chain?
- How are humans connected to the food chain? What role do we play?
- Are there any foods we eat that don’t get their energy from the sun?
- What would happen if any one part of the food chain disappeared?
- What can we do to help keep food chains, and ecosystems, healthy?

Extensions for additional classroom projects/activities

- ▶ Have the students illustrate a food chain that they were a part of.
- ▶ Look at different ecosystems (e.g., wetland: see the Junior Division “Ecosystems in Action” activity), identify food chains that are present.
- ▶ Have the children write their own story to be acted out (e.g., starting at the sun, then as a seed, to hay, to a cow, to humans).

Curriculum Connections: Clustering of Expectations

GRADE 1: SCIENCE & TECHNOLOGY—Needs And Characteristics of Living Things (2007)

OE 1 assess the role of humans in maintaining a healthy environment

- 1.1 identify personal action that they themselves can take to help maintain a healthy environment for living things, including humans (*e.g., be careful what they put down a drain at home; show care and concern for all living things*)
- 1.2 describe changes or problems that could result from the loss of some kinds of living things that are part of everyday life (*e.g., if we lost all the cows, all the insects, all the bats, all the trees, all the grasses*), taking different points of view into consideration
- 2.2 investigate and compare the basic needs of humans and other living things, including the need for air, water, food, warmth, and space, using a variety of methods and resources (*e.g., prior knowledge, personal experience, discussions, books, videos/DVDs, CD-ROMs*)

OE 3 demonstrate an understanding of the basic needs and characteristics of plants and animals, including humans

- 3.5 describe how showing care and respect for all living things help to maintain a healthy environment (*e.g., ...caring for the school and the schoolyard as an environment*)

GRADE 1: SCIENCE & TECHNOLOGY—Energy in our Lives (2007)

- 2.6 investigate how the sun’s energy allows humans to meet their basic needs, including the need for food
- 3.2 demonstrate an understanding that the sun, as the earth’s principal source of energy, warms the air, land, and water; is a source of light for the earth; and makes it possible to grow food
- 3.3 identify food as a source of energy for themselves and other living things
- 3.5 demonstrate an understanding that humans get the energy resources they need from the world around them and that the supply of many of these resources is limited so care needs to be taken in how we use them

GRADE 2: SCIENCE & TECHNOLOGY—Growth and Changes in Animals (2007)

- 1.2 identify positive and negative impacts that different kinds of human activity have on animals and where they live (*e.g., actions of animals lovers and groups that protect animals and their rights, the home owner who wants a nice lawn, people who visit zoos and wildlife parks, pet owners*), form an opinion about one of them, and suggest ways in which the impact can be minimized or enhanced

GRADE 3: SCIENCE & TECHNOLOGY—Growth and Changes in Plants (2007)

- 1.1 assess ways in which plants are important to humans and other living things, taking different points of view into consideration, and suggest ways in which humans can protect plants
- 1.2 assess the impact of different human activities on plants, and list personal action they can take to minimize harmful effects and enhance good effects
- 3.6 describe ways in which plants and animals depend on each other

GRADE 7: SCIENCE & TECHNOLOGY—Interactions in the Environment (2007)

OE 2 investigate interactions within the environment and identify factors that affect the balance between different components of an ecosystem

3.1 demonstrate an understanding of an ecosystem (*e.g., a log, a pond, a forest*) as a system of interactions between living organisms and their environment

3.3 describe roles and interactions of producers, consumers, and decomposers within an ecosystem

3.8 describe ways in which human activities and technologies alter balances and interactions in the environment (*e.g., clear-cutting a forest, overusing motorized water vehicles, managing wolf-killings in Yukon*)

We Are Sun-Powered!

Curl into a ball and imagine that you are a tiny seed buried in the rich soil. The energy from the sun is stored inside your seedpod and nourishes you as you begin to grow. Soon you burst open and your roots grow downward, sucking in particles of sunlight energy and water that have waited hundreds of years for you. Your grasses grow tall as they use the sun’s energy to make food out of water and air. A bug crawls through your grassy top, nibbling on the green blades. Now the bug has absorbed the particles of sunlight (pretend to be the bug because the particles of sunlight are now part of it). The bug crawls high on a blade of grass. A sudden burst of wind shakes the grass, the bug loses his grip...and splash! The bug has fallen into a stream. Under the water a fish notices the rippling surface...and snap! A big fish has eaten the bug (become the fish because the particles of sunlight are now part of the fish). Wading along the edge of the stream is a bear. He slaps his huge paw into the water and the fish lands on the ground. Then, gulp! The bear has swallowed the fish (pretend to be the bear). Quietly creeping through the woods is a hunter. The hunter silently sets an arrow in his bow and lets it fly. The hunter has killed the bear. The bear meat is made into a stew for the hunter’s family (pretend to be the hunter). Now the particles of sunlight are part of you. Where will they go from here?

The Sun Powers All *Tune: Farmer in the Dell*

<i>The sun shines on the Earth,</i>	<i>An insect chews a plant,</i>	<i>A meat-eater hunts for food,</i>
<i>The sun shines on the Earth,</i>	<i>An insect chews a plant,</i>	<i>A meat-eater hunts for food,</i>
<i>The sun shines down and powers all,</i>	<i>One-by-one they're linked to the sun,</i>	<i>One-by-one they're linked to the sun,</i>
<i>The sun shines on the Earth.</i>	<i>An insect chews a plant.</i>	<i>A meat-eater hunts for food.</i>

<i>A plant munches the sun,</i>	<i>An animal eats a bug,</i>	<i>The food chain is complete,</i>
<i>A plant munches the sun,</i>	<i>An animal eats a bug,</i>	<i>The food chain is complete,</i>
<i>One-by-one they're linked to the sun,</i>	<i>One-by-one they're linked to the sun,</i>	<i>One-by-one they're linked to the sun,</i>
<i>A plant munches the sun.</i>	<i>An animal eats a bug.</i>	<i>The food chain is complete.¹</i>

¹ Both “We Are Sun-Powered” and “The Sun Powers All” are adapted very slightly from their source, Katherine Sheehan and Mary Waidner’s *Earth Child: Games, Stories, Activities, Experiments & Ideas about Living Lightly on Planet Earth*. Revised edition (1994), 29

Appendix C *Food Chain Name Tags*

Sun

Sun

Plant
(PRODUCER)

Plant
(PRODUCER)

Insect
(CONSUMER)

Insect
(CONSUMER)

Animal
(CONSUMER)

Animal
(CONSUMER)

Meat Eater
(CONSUMER)

Meat Eater
(CONSUMER)