

Food Chains

Melissa Freeman
Shawmont Elementary

Overview

Rationale

Objectives

Strategies

Standards

Classroom Activities

Annotated Bibliography

Appendix

Overview

Many students understand that we get our food from either animals or plants that we eat, but they do not completely understand the food chain and how energy is passed through a variety of organisms in a food chain (Royce, 2013). Food chains and food webs are important science concepts that help children understand how living things in nature are connected. It also shows how living things rely on each other for food and energy ("Food chain background," 2014).

Rationale

Why Should We Teach Science in Elementary Schools?

According to the National Science Teachers Association, inquiry science must be a basic in the day-to-day curriculum of elementary school science. Teaching students science through inquiry will help students to develop problem solving skills that will continue to help them succeed in an ever more scientific and technological world ("Nsta position statement;," 2002). According to a study by Georgetown University Center on Education (2011), 8 million jobs in the United States will require a college degree in science, technology, engineering or math in 2018 (Murphy, p.1).

How to Teach Science Effectively

The National Science Teacher's Association states that elementary school students learn science best when:

1. They are involved in first-hand exploration and investigation and inquiry/process skills are nurtured.
2. Instruction builds directly on the student's conceptual framework.
3. Content is organized on the basis of broad conceptual themes common to all science disciplines.
4. Mathematics and communication skills are an integral part of science instruction (“Nsta position statement,” 2002).

First-hand exploration and investigation and inquiry/process skills can be taught at any age though it is important the inquiry is age appropriate. Elementary students are engaged in the inquiry process when they ask simple questions, complete an investigation, answer questions about the investigation, and then present results (Allen, 2006). Young students complete this process often; it is now a matter of recording and observing this as the scientific inquiry process.

Inquiry based instruction can be divided into three categories: structured inquiry, guided inquiry, and open inquiry. Structured inquiry is what teachers in the elementary grades use most often. In structured inquiry, the students are typically given step-by-step instructions, but throughout the lesson students must record the information they deem most important and interpret their own data. In the guided inquiry, students decide on the procedure as well as recording the information they deem most important and interpreting their own data. The guided inquiry method is for late elementary and middle years students. Finally, the open inquiry, for high school students, allows for the student to make all of the decisions including creating the question to investigate and the process for investigation (Allen, 2006).

What are Food Chains and Food Webs?

Food chains are vital for survival. A food chain demonstrates how living things all rely on each other for food in a single path. Food provides all living things with energy, therefore as we travel up the food chain, energy also travels from one living thing to another.

There are many different groups in a food chain. A food chain starts with producers. Producers are living things that make their own food through the process of photosynthesis. These include green plants and photosynthetic bacteria. Consumers are living things that eat other living things for survival. The majority of living things are producers. There are three other groups in the food chain that are more familiar to students; carnivores, herbivores, and omnivores. Carnivores, otherwise known as meat eaters, eat other animals such as cows, fish, and deer. Herbivores, otherwise known as plant eaters, eat only plants. Omnivores, which the majority of people are, eat both plants and animals.

Food webs are groups of connected food chains. These food webs link species in a single ecosystem. A food web can be very complicated. It shows the many species eating at various levels. A food web may have as many animals as fit from their ecosystem.

Objectives

This unit is intended for students in 1st grade. The students spend most of their day in a self-contained classroom. They only leave for a 45 minute lunch period and a 45 minute prep class.

The objectives of this unit will include the following:

- Students will be able to identify that all living things get energy from the food they eat.
- Students will be able to identify that a food chain starts with plants and ends with animals.
- Students will be able to identify that a food web is a group of connected food chains.
- The students will be able to identify the difference between producers and consumers.
- The students will be able to identify that all animals depend on plants and that some animals eat plants for food while others eat animals that eat the plants.
- Students will be able to identify the differences between herbivores, carnivores, and omnivores.

Strategies

Think-Pair-Share

During Think-Pair-Share students will think in their head for several minutes about a question or idea, and then they will turn to the person next to them and share their thoughts. Think-Pair-Share allows for an increase in the quality of student responses. It gives students time to think and respond to questions or prompts. It also takes the pressure off of students who may be intimidated to respond in front of the whole group. As students are discussing their responses they are also talking out their answers and are able to make better sense of their ideas.

Activating Prior Knowledge

The teacher will activate prior knowledge through each lesson. Through activating prior knowledge teachers are helping children to connect the text to what they already know. Activating prior knowledge helps students to begin to make connections to the new text they will be reading. When students are able to make connections to text they become more invested in the text they are reading or listening to.

Graphic Organizers

Students will use graphic organizers throughout this unit. Graphic organizers are a tool that allows students to visually express ideas and concepts. When students use graphic organizers they are able to see undiscovered patterns and relationships that they may not have seen by simply reading or listening to a story. Graphic organizers also help to facilitate conversation about the story and make an excellent reference.

Modeling

Modeling will be used by the teacher to help convey understanding of new ideas and methods. Modeling is when the teacher demonstrates how to complete different activities by saying aloud the thought process.

Standards

The Core Curriculum of the School District of Philadelphia is aligned to the Pennsylvania Common Core State Standards.

1.2.1.E: Use various text features and search tools to locate key facts or information in a text.

1.2.1.F: Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.

1.2.1.G: Use the illustrations and details in a text to describe its key ideas.

1.2.1.B: Ask and answer questions about key details in a text.

1.2.1.J: Use words and phrases acquired through conversations, reading, and being read to, and responding to texts, including words that signal connections and relationships between the words and phrases.

1.2.1.K: Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade level reading and content.

Classroom Activities

Lesson 1: Introduction to Food Chains

Objective:

- The students will be able to identify that a food chain starts with plants and ends with animals.
- The students will be able to identify that a food chain is how living things are connected.
- The students will be able to identify that a food chain shows how living things rely on each other for food.
- The students will be able to identify that the food chain is how energy is moved from one living thing to another.

Materials:

- Book – *Who Eats What? Food Chains and Food Webs*
- Food chain poster
- Food chain cut and paste
- Scissors
- Glue
- Crayons

Procedure:

1. Begin by creating a KWL chart with your students. Label the top of the chart paper “Food Chains”. Ask students to tell you what they think they know about food chains and write answers in the Know column. Then explain to students that we will be learning about food chains. Tell students that food chains are how living things are connected. A food chain shows what plants and animals eat to survive and transfer energy. Then fill in the W of the KWL chart, what do students want to know about the food chain.
2. Read aloud *Who Eats What? Food Chains and Food Webs*. Stop to discuss and ask and answer questions.
3. Review food chain poster.
4. Pass out food chain cut and paste. See appendix. Read aloud directions. Have students cut and paste the pictures in the correct order of the food chain. Have students label the pictures of the food chain.
5. Add any learned information to the L column of the KWL chart.
6. As an extension, show students the poem *Links in the Food Chain*. See appendix. Read the poem having students say the response part “links in a food chain”. This can be something that is repeated daily.

Lesson 2: Food Webs

Objectives:

- Students will be able to identify that all living things get energy from the food they eat.
- Students will be able to identify that a food web is a group of connected food chains.

Materials:

- Book – *Who Eats What? Food Chains and Food Webs*
- KWL chart
- Plant and animal picture cards.
- Chart paper
- Glue
- Markers

Procedure:

1. Review the KWL chart from yesterday. Focus on what students learned about food chains, activating their prior knowledge.
2. Reread the book *Who Eats What? Food Chains and Food Webs* focusing on the difference between food webs and food chains.
3. Hand out plant and animal picture cards giving students a random card. First, call four cards to come to the front, such as, grasshopper, frog, snake, and hawk. Ask the students to make a food chain by standing in the order in which they are eaten.
4. Then paste these pictures onto a large piece of chart paper. Together as a class start to build a food web by adding the other picture cards with arrows in their appropriate places.
5. Review the difference between a food chain and a food web.
6. Add any learned information to the L column of the KWL chart.

Lesson 3: Producers vs. Consumers

Objectives:

- Students will be able to identify that all living things get energy from the food they eat.
- Students will be able to identify that a food chain starts with plants and ends with animals.

- Students will be able to demonstrate understanding of the words producers and consumers.

Materials:

- Food Chain video at <http://www.turtlediary.com/grade-1-games/science-games/food-chain.html>
- Producer and Consumer Sort
- Scissors
- Glue
- Crayons

Procedure:

1. Begin by reviewing what a food chain is. Review what was added to the L part of the KWL chart and add any more W's for want to know.
2. Show the class the video *Food Chain* at <http://www.turtlediary.com/grade-1-games/science-games/food-chain.html>.
3. Pause throughout video to ask questions:
 - a. What do all living things need?
 - b. Where do living things get energy?
 - c. Where do all food chains start?
 - d. Where do all food chains end?
 - e. Why are plants called producers?
 - f. Why are animals called consumers?
 - g. What are animals that eat only plants called? Can you name some?
 - h. What are animals that eat other animals called? Can you name some?
 - i. What are animals that eat both plants and other animals for energy called? Can you name one?
4. Create a chart of producers and consumers.
5. Have students complete the Producers vs. Consumers handout. See appendix.
6. Have students add information to the L of the KWL chart.

Lesson 4: Herbivores, carnivores, omnivores

Objective:

- Students will be able to demonstrate understanding of the words producers and consumers.

- Students will be able to classify various animals by herbivores, carnivores, and omnivores.

Materials:

- Food Chain video at <http://www.turtlediary.com/grade-1-games/science-games/food-chain.html>
- Herbivore, carnivore, and omnivore sort
- Scissors
- Glue
- Crayons

Procedure:

1. Begin by reviewing what a food chain is. Review what was added to the L part of the KWL chart focusing on producers and consumers and add any more questions to the W column for want to know.
2. Rewatch the video *Food Chain* at <http://www.turtlediary.com/grade-1-games/science-games/food-chain.html>.
3. Pause throughout video to ask questions and discuss any new information:
 - j. What do all living things need?
 - k. Where do living things get energy?
 - l. Where do all food chains start?
 - m. Where do all food chains end?
 - n. Why are plants called producers?
 - o. Why are animals called consumers?
 - p. What are animals that eat only plants called? Can you name some?
 - q. What are animals that eat other animals called? Can you name some?
 - r. What are animals that eat both plants and other animals for energy called? Can you name one?
4. Create a chart of herbivores, carnivores, and omnivores.
5. Have students complete the Herbivore, Carnivore, and Omnivore sort. See appendix.
5. Have students add information to the L of the KWL chart.

Lesson 5: The Food Chain/Transfer of Energy

Objectives:

- Students will be able to identify that all living things get energy from the food they eat.

- Students will be able to identify that energy is passed along the links of a food chain.
- Students will be able to identify that a food chain starts with plants and ends with animals.

Materials:

- 12 bags of popcorn (or any other snack food that can easily be divided)
- 1 picture of the sun
- 12 pictures of plants
- 6 pictures of herbivores
- 3 pictures of carnivores
- Yarn
- crayons

Procedure:

1. Review what students have learned thus far about the food chain, including producers, consumers, herbivores, carnivores, and omnivores.
2. Explain to students that we will be demonstrating how the links of the food chain pass along energy. Each student will be a link in the food chain. Pass out the pictures, 1 sun, 12 plants, 6 herbivores, and 3 carnivores. Have students color their pictures and then create a necklace using yarn. (If you have more than 21 students, partner them together.)
3. After students have their necklaces start the food chain with giving the sun 12 bags of popcorn. The sun then passes all of their energy to the plants, give each plant one bag of popcorn.
4. The plants then eat half of the popcorn for energy and then pass out the rest to the 6 herbivores.
5. The 6 herbivores consume half of the popcorn and pass the rest to the 3 carnivores. The carnivores will consume the rest of the popcorn.
6. As a class we will review how the energy was transferred and what happened as the energy was transferred.
7. Students will add new information to the KWL chart.

Annotated Bibliography

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“Links in a food chain.” iStudy Flies. 2005. Web. 5 May 2014.

Murphy, T. (2011). STEM Education -- It's Elementary. *US News and World Report*.

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Teacher Resources:

Energy in our lives. (n.d.). Retrieved from http://www.mrcollinson.ca/1_science/energy/1_science_energy_complete.htm

Student Resources:

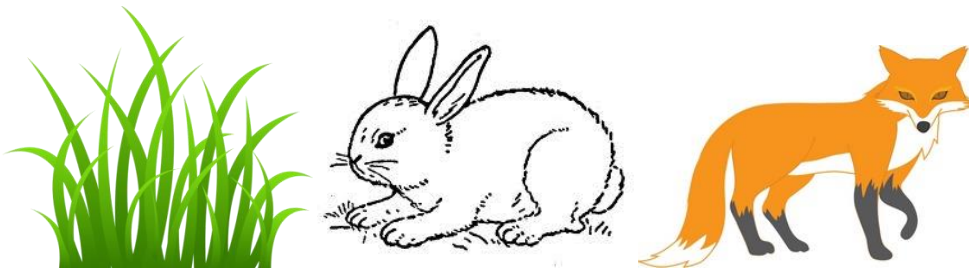
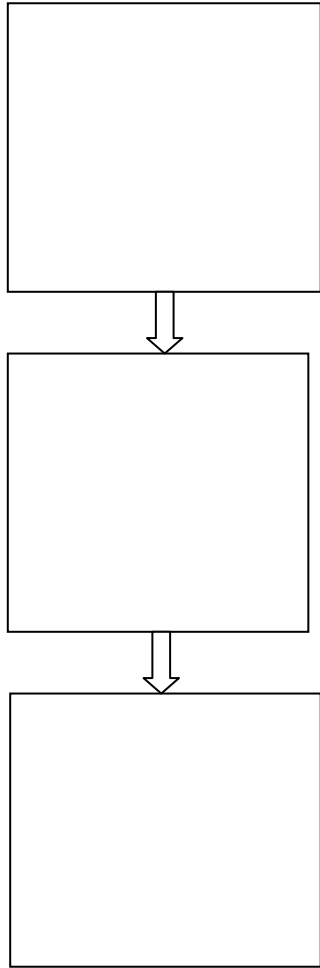
Food chain [Web]. (2014). Retrieved from <http://www.turtlediary.com/grade-1-games/science-games/food-chain.html>

Lauber, P. (1995). *Who eats what? food chains and food webs*. HarperCollins.

Zoehfeld, K. (2012). *Secrets of the garden*. Alfred A. Knopf Books for Young Readers.

Name: _____

A Simple Food Chain



Name: _____

Producers vs. Consumers

Producers	Consumers

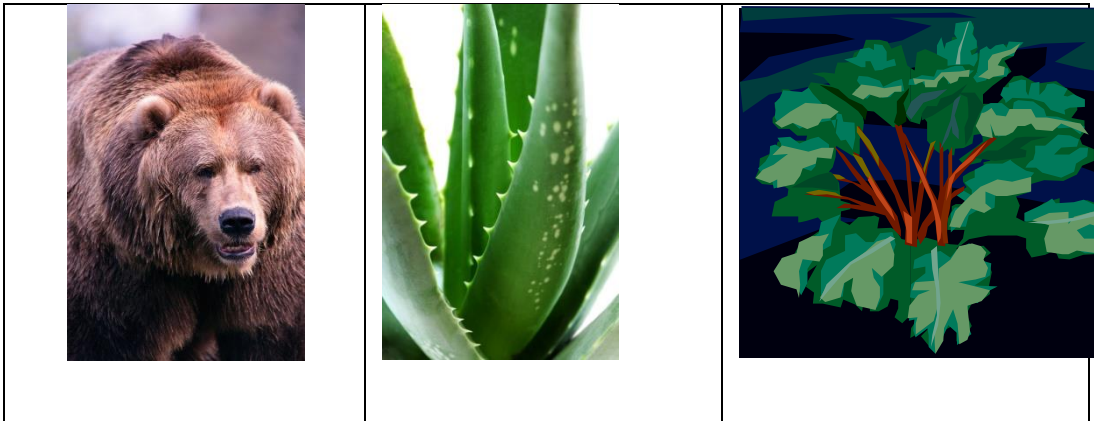
A producer _____

_____.

A consumer

_____.

Producers vs. Consumers



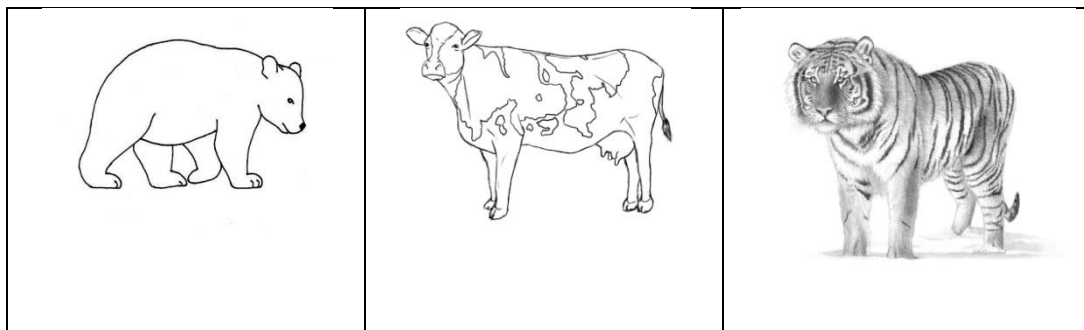


Name: _____

Herbivores, Carnivores, Omnivores, OH MY!

Herbivore	Carnivore	Omnivore

Cut and paste under the correct heading.



Complete each sentence.

Herbivores

-----•

Carnivores

-----•

Omnivores

-----•

LINKS IN A FOOD CHAIN

Author Unknown

*There once was a flower that grew on the plain,
Where the sun helped it grow, and so did the rain —
Links in a food chain.*

*There once was a bug who nibbled on flowers,
Nibbled on flowers for hours and hours!
The bug ate the flower that grew on the plain,
Where the sun helped it grow, and so did the rain —
Links in a food chain.*

*There once was a bird who gobbled up bugs,
And creepies and crawlies, and slimies and slugs.*

*The bird ate the bug, who nibbled on flowers,
Nibbled on flowers for hours and hours!*

*The bug ate the flower that grew on the plain,
Where the sun helped it grow, and so did the rain —*

Links in a food chain.

*There once was a snake who often grabbed birds,
And swallowed them whole, or so I have heard.*

*The snake ate the bird, who gobbled up bugs,
And creepies and crawlies, and slimies and slugs.*

*The bird ate the bug, who nibbled on flowers,
Nibbled on flowers for hours and hours!*

*The bug ate the flower that grew on the plain,
Where the sun helped it grow, and so did the rain —*

Links in a food chain.

There once was a fox, and I'll make a bet:

He'd eat anything he could possibly get.

*The fox ate the snake, who often grabbed birds,
and swallowed them whole, or so I have heard.*

*The snake ate the bird, who gobbled up bugs,
And creepies and crawlies, and slimies and slugs.*

*The bird ate the bug, who nibbled on flowers,
Nibbled on flowers for hours and hours!*

*The bug ate the flower that grew on the plain,
Where the sun helped it grow, and so did the rain —
Links in a food chain.*

*The fox, he grew older and died one spring day,
But he made the soil rich, when he rotted away.
A new flower grew where he died on the plain.
And the sun helped it grow, and so did the rain —*

LINKS IN A FOOD CHAIN.