

## What is a food chain?

# **MY OWN FOOD CHAIN PROGRAM (K-2)**

## **Food Chain Introduction** **(ILS 12A, 12B)**

### **Overview**

This curriculum explores the relationship between people and the food they eat. It aims to give children in grades K-2 a basic understanding of the flow of energy through the food chain, and the place of people in the food chain. If teachers complete the entire curriculum, their classes will explore food chains in nature, focusing on its individual links and looking at the flow of energy as a whole. Students will then look at the place of people in the food chain, and discover how people have appropriated nature's systems in agricultural practices – making the food chain our own. Classes will compare traditional and sustainable agricultural practices.

Sustainable Agriculture, for the purpose of this curriculum, shall be defined as "a system of food production, supported by consumers, where farming operations, practices and technologies work in harmony with the natural systems that sustain life on earth."

### **Suggested Grade Level**

This curriculum is designed for kindergarten through second grade levels. The topics covered can be built upon in complexity throughout that age range.

### **Approximate Time**

45 minutes.

### **Objectives**

1. The students will learn that all living things need to procure and use energy.
2. The students will define food chains and create some using pictures of plants and animals.
3. The students will think about where their food comes from.

### **Activity Abstract**

The class will learn the basic structure and function of a food chain. They will create several example food chains.

### **Background Information**

All living things – from huge blue whales to tiny phytoplankton floating in the sea; from oak trees to buffalo – need to take in and use energy to survive. A food chain is the transfer of energy from one organism to another. The only source of energy available to life on earth is the sun. This means that all food chains must start with the sun. Green plants are the only things on earth that are able to use the sun's energy to create food energy for themselves and other living things. Through the process of photosynthesis,

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plants can take water and carbon dioxide, and, in a reaction catalyzed by the sun's energy, create a simple sugar with oxygen as a byproduct. Green plants are called producers, since they produce the food for other living things. Plants create this packaged energy – sugar – so that they can use it to carry out important life processes. They need energy to grow, reproduce and make seeds, etc.

Many animals eat green plants to get their own energy. These animals, called primary consumers, are the next link in the food chain. They eat plants to get energy to move around (finding plants and avoiding predators), reproduce, and grow.

At each link in a food chain, a substantial portion of the sun's energy - originally trapped by a photosynthesizing plant - is let back to the environment (ultimately as heat). Thus, there is less energy being transferred at each level of the food chain. That means there need to be more plants than primary consumers; more primary consumers than secondary, and so on. It takes about 10 times as many plants to support one primary consumer; and ten primary consumers to support one secondary consumer, and so on. For this reason, the food chain is often described as a pyramid

And what happens when you get to the top of a food chain, to a consumer that is so big or well adapted that nothing else can eat it? Decomposers are organisms, often bacteria, insects or fungi, which get their energy by eating dead things. As they get their energy, they break down materials, making the soil richer. Decomposers often mark the beginning of whole new food chains. For example,

Sun > grass > mouse > hawk > maggots (flies) > frog > heron  
would be a food chain that “restarted” when decomposers (maggots) got the energy from a dead top-of-the-food chain animal.

### **Materials**

- Letter to class (in authentic looking envelope)
- Pictures of plants and animals that create food chains, mounted on color-coded paper.

### **Procedure (Session 1)**

1. Open class by taking out the letter and explaining that you are very excited because the class got something in the mail today.
2. Read the letter from “all living things.” (See appendix.) Try to figure out the riddle.
3. **Tap prior knowledge.** Ask class if anyone has heard of a food chain. That letter sounds important; we better learn about them. Does anyone have a favorite food? Take several answers. Then pick one to analyze. Pick pizza, it's a good one and someone always says it.
4. **Introduce scientific principle.** Draw a pizza on the board. Tell the students that you want to figure out exactly where that pizza came from. First, take the parts of the pizza... bread/crust, cheese, tomato sauce, pepperoni. Draw each on the board under the pizza (or however you want to organize it...)
5. Then, ask the class to figure out where one of those parts came from. Start with the easiest, which is tomato sauce (simplified). It comes from tomatoes (draw a tomato).



6. Explain that tomatoes grow on plants. Ask, Are plants living? So what do plants “eat” or how do they get energy?
7. Discuss answers... soil? Water? Sun? Explain that plants need all these things to make food, but the thing that’s really important is sun!
8. Do the same thing with the other ingredients of pizza. Be simple (for crust, use flour, which comes from wheat... and leave out the other ingredients.)
9. Explain, so we’ve created the food chains that lead to pizza. (Optional: do the same with another food. Fish is fun.)
10. **Conclusion/Wrap-up.** Now you are going to create your own food chains. Each group (table) is going to get pictures of plants and animals that make up a food chain. You need to work together to put them in the order you think they go in. Pass out color-coded pictures to the tables. (Each chain should have a sun, a plant, primary consumer, and a secondary consumer). Allow them to put theirs in order.
11. Have each group share their food chain with the class by coming up and holding it in order. Have them say, “This is the sun, it gives energy to plants.” “This is grass, it gets energy from the sun and gives it to rabbits,” etc.
12. Tell students that over the next few weeks/months we will be doing a lot of exploring and thinking about our food and where it comes from.

### **Literature Links (optional)**

For older students (2<sup>nd</sup> grade), read the book “Pass the Energy Please” by Barbara Shaw McKinney, Chad Wallace illustrator.

### **References**

<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/F/FoodChains.html>

<http://www.planetpals.com/foodchain.html>

<http://www.aliexplorer.com/ecology/topic4.html>

<http://www.vtaide.com/png/foodchains.htm>

Van Matre, S. (1990). Earth Education: A New Beginning. Cedar Cove: Institute for Earth Education.



**Appendix B: Text of Letter.**

Dear class,  
Eggs for breakfast or salad with dinner  
If you don't do this you'll get so much thinner  
And be really tired all the day long  
Without even the energy to sing a song!

All living things need energy, too.  
To do all the things that they need to do.  
In order to get it they have to partake  
Of sunlight carefully served on a plate.

You know that you do this, and dogs do as well  
And chickens and kittens and snails in their shell  
But plants have to also, and mushrooms, you know  
Lettuce and cherries in order to grow.

So think hard and tell me what you have to do  
To get all this energy inside of you  
The answer's so simple it really is neat,  
To live and survive we all have to \_\_\_\_\_.

That's right boys and girls, we all need our food  
What's more, our food needs food too  
It's crazy, I know but met me explain  
We're all connected through things called food chains!

Sincerely, the Plants and Animals of Earth