

## 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  
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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 the 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  
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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.

## Exploring Energy in an Ocean Food Pyramid

### Materials:

- 1 large yellow disk labeled the sun
- 20 plastic bags with 20 crackers, pretzels, or nuts (be careful with allergies!)
- 7 empty plastic bags
- Large pyramid diagram
- 20 signs/large index cards "PRODUCERS: GREEN PLANTS
- 4 signs/large index cards "FIRST ORDER CONSUMERS: HERBIVORES
- 2 signs/large index cards "SECOND ORDER CONSUMERS: CARNIVORES
- 1 sign/large index card "THIRD ORDER CONSUMER: OMNIVORE

Have one student act as the sun and wear the large yellow circle. This person starts out with the 20 plastic bags of "energy units".

Have 20 students pin or hang the "producers" sign on. These students will play the role of green plants. The sun should give each of them a plastic bag with 20 edible objects representing 20 units of food energy. At the base of this pyramid there are 400 energy units.

Each "plant" eats 5 crackers to represent energy that the plant uses for respiration and growth. This leaves 15 units to be stored in plant tissues for a total of 300 energy units stored in the 20 "plants"

Each herbivore (first order consumer) "eats" five "plants" and takes its bag of energy units. Each herbivore should get 75 energy units in his bag. Each herbivore eats 45 crackers representing 45 units of energy needed for respiration, for movement, and for other body processes that keep the animal alive. This leaves 30 energy units to be stored as fat, flesh, bones, and organs in these animals for a total of 120 unused energy units.

Each of the two carnivores (second order consumers) now "eats" two herbivores and takes their bag of energy units and empties them into his bag. Each herbivore should have 60 energy units. Each herbivore eats 30 crackers representing 30 energy units to supply energy for finding food, staying warm, and other life processes. This leaves 30 crackers as energy units stored in the bodies of these animals.

The top predator "eats" the two-second order consumers and takes their bag of energy units for a total of 60 energy units in the top predator's bag. This predator eats 30 crackers representing 30 energy units used in life processes leaving 30 unused energy units to be stored in body tissue.

### Summary of Food Pyramid Activity

	# of students	Energy U's Taken	Energy U's Used	Energy U's Stored	Energy U Total
Producers	20	20	5	15	400
Herbivores	4	75	45	30	300
Carnivores	2	60	30	30	120
Top Predator	1	60	30	30	30

Draw a large food pyramid to represent this data. Label each layer with kind of organism, number in this activity, and the total energy units at each level.

## Analysis Questions

- Why is a pyramid a good representation of energy moving through a food chain?
- What happens to the energy that is not available to be passed from one level to the next?
- How did we show this in our activity?
- Where in a food chain are the largest populations?
- How was this shown in our activity?
- How is this shown by a food pyramid?
- Where in the food chain are populations the smallest?
- How was this shown in our activity?
- How is this represented by a food pyramid?
- What happens to the total amount of energy in a food chain as the energy moves through the chain from producer to different levels of consumers?
- How was this shown in our activity?
- What organisms might be at each level of the food pyramid in each of the following environments?
  - Ocean
  - Pond
  - Forest
  - Desert'