The Pyramid in Grandpa’s Pond

**Goal:** To help students understand the use of figurative languages as they learn how different forms of life relate to one another in a pond.

**Subjects:** Language arts, reading, mathematics, science

**Background:**

A figure of speech is language used to compare one thing with another thing. In most figures of speech, a complicates or unfamiliar idea is compared with a simple or familiar one to give the reader a better understanding. When you use a **metaphor** you are making a comparison without coming out and telling your audience that is what you are doing. (“The Louisiana Purchase opened the West to a flood of eager newcomers.”)

When you use **similes**, you use comparison words (like, as) to signal that you are making a comparison. (“The large numbers of newcomers moving into the Louisiana Purchase were like a flood rushing over the land.”)

**Personification** is speech which gives human characteristics to things which are not human. (“Old Man Winter slipped into town last night.”)

An **analogy** is a comparison of a comparison. (“Black is to white as day is to night.”)

Figurative language isn’t just used by poets and fiction writers. Scientists use it too, because it helps them give us a mental picture of complicated ideas. For example, what picture do you see when you hear the phrase “food chain”? Do you think of a chain made out of green beans or French fries?

The term “food chain” is a metaphor scientists use to explain how food energy is transferred from one living thing to the next. It is only one way of explaining these relationships. Although this term works well to explain some things about the transfer of energy among living things, it doesn’t explain everything. For that reason, scientists may have to use other metaphors to explain other things about the same subject.

Food energy starts with the sun, which plants use to make their own food energy through a process called “photosynthesis.” Many times the food chain is pictured as a big fish eating a smaller fish which has just been eaten an insect. The insect may have eaten a smaller insect which just took a bite out of a pond plant. The food energy starts with the sun, is used by the plant, then transferred to the small insect when it takes a bite from the plant and so on until it gets to the human.

The dictionary says a food chain can be used for binding, connecting, or transmitting motion. When scientists talk about the food chain, they usually mean it moves energy from one organism to the next one up the food chain (transmits motion). But it can also be used to describe the way organisms are connected by their need to survive.

**Step-by-step Activity**

1. Review figuratively language with students, then share background material.
2. Hand out copies of the story, “The Pyramid in Grandpa’s Pond.”
3. Read the story aloud. Lead a class discussion in which you ask which figure of speech best describes the relationships between organisms in pond—“food chain,” “food web,” or “food pyramid.” Does any one of the metaphors explain the relationships fully? Can your students think of other metaphors that might be used?
4. Go back over the story and, as a class, decide whether the figures of speech in bold print are metaphors, similes or personifications.

Related Activities
1. Write the following vocabulary words on the chalkboard and have students find their definitions in the dictionary:
   - Phytoplankton
   - plankton
   - zooplankton
   - food chain
   - Primary producers
   - secondary producers
   - consumers
   - food web
2. Divide students into groups of three or four and have each group create a model of a food chain, food web or food pyramid.
3. Use Grandpa’s pyramid formula to figure out how many pounds of plankton it would take to add one pound each to 26 snapping turtles.
4. Have students work the following math problem: If grass is at the bottom of the human pyramid, and only 10 percent of food energy is transferred from one level to the next, how many pounds of grass would it take to add five pounds to your weight.
5. Brainstorm all the ways the word “chain” is used figuratively to describe different phenomena (chain reaction, chain of command).