SEED Curriculum  
Grade 1  
Spring: Visit 3  

Title: Trophic Levels  

Materials: trophic level pyramid boxes, posters.  

1. Review the different levels of eaters.  

Q. What is a producer? What is a consumer? What are the different types of consumers? What is a decomposer? (name a few of each)  

2. These are called trophic levels. “Troph” means to eat; these are all different types of eaters. If you put each level on top of each other you get a pyramid (show poster with pyramid). This pyramid is called a “trophic pyramid.” Each level is on top of the one below it because it relies on that one for its energy.  

Activity: Build the pyramid with the blocks. Ask them to identify the different levels.  

Q. Can you take out a block? What about a whole trophic level? What happens above the missing level? They have no food. What about below it? There’s nothing eating them anymore. What happens if you take out the producers? (Have a student try.) The pyramid falls apart, because there’s nothing to support the higher levels. This is because no organisms can survive without the energy the producers make.  

Q. What about if you take out the plant consumers? None of the meat consumers will survive.  

Q. What about if the meat consumers are removes? The pyramid remains standing even without the meat-eaters, but now there is no one to eat the plant-eaters. What happens to them? Their population increases, and gets larger than it should because there is nothing to control it. Example: if you take away all the mountain lions, the deer will take over. Because there are so many more deer, the
plants will suffer, because they get eaten more to support the larger deer population.

Q. Which level is the most important in the pyramid? The producers.

3. The trophic levels are in the shape of a pyramid because not all of the energy in one level goes on to the next level. Only about 10% of the energy in one level actually reaches the next one! The rest of the energy is lost before it moves to the next level. It doesn't stay in the body of the organism so it doesn't get eaten and passed on.

Q. Where do you think this energy goes? What do we do during the day that makes us hungry? (anything with motion, ride a bike, etc.) We use energy every time we move. This energy we can't pass on to another trophic level, because it's no longer in an object like an apple. It gets lost as motion/movement, or heat; we also use energy to keep our bodies warm. Just like how light, also a non-object/matter form of energy started out the pyramid, these non-matter forms of energy are lost from it all the way up. This is why the pyramid is a pyramid instead of a "trophic square."

That's why in a forest there are thousands of big trees, but only a few deer, and even fewer mountain lions. The weight and area taken up by the plants, the producers, is far greater than that taken up by the meat-consumers. As you move up the pyramid there are fewer and fewer organisms. One owl at the top is equal to 100 mice lower down. The majority of the energy the producers make never reach the top consumers, but it is that little bit that does which is the most important, because it lets those few animals survive.

4. Activity:

   Have the kids all go to an open area, inside or outside, to act out the parts as you read the following:

   "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 seed lobes and nourishes you as you begin to grow. Soon you burst open and your roots go downward, sucking in particles of water. Your shoot grows tall as it uses the sunlight energy to produce food out of water and air. A bug crawls through your grassy top, nibbling the green blades. Now the bug has absorbed the particles of sunlight, so become the
bug. The bug crawls high on a blade of grass. A sudden burst of wind shakes the grass, and the bug loses its grip...and splash!! The bug blows away and falls in a stream. A fish underwater sees the rippling surface... and snap!! The fish eats the bug. Become the fish now, because the particles of sunlight are now part of him. A bear wades along the edge of the stream. He sees you swimming by and slaps his great paw into the water. Then, gulp! The bear swallows you up!! Pretend to be the bear now, lumbering through the woods, because that is where the particles of light next travel. Quietly creeping through the woods is an Indian brave. He silently sets an arrow in his bow and lets it fly. The Indian has killed the bear. That night the bear meat is made into a stew and served at dinner. Now you are an Indian sitting around a fire and the sunlight is a part of you. Where will it travel next?

You can see that all animals are sun-powered, even ourselves!