Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_

**Biomagnification and Bioaccumulation**

**Bioaccumulation** is the storage of any ingested substance in biological tissue. It is not metabolized and does not leave the body. Most bioaccumulation occurs in the fatty tissue of the body.

**Biomagnification** is the increasing levels of a substance up a food chain. When the environment is sprayed or exposed to a toxic substance plants will absorb it into their tissues through bioaccumulation. When the plants are eaten by a primary consumer all of the toxic substance in the plant is passed to the primary consumer. This happens again as all of the toxin ingested from every plant the primary consumer ate will be passed to the secondary consumer in the food chain. This will continue all the way up the food chain.

**1. Draw an energy pyramid illustrating one food possible food chain with 4 nodes. Start with grass as the producer. Choose your organisms and place them in the correct trophic level:** hawk, robin, rabbit, snake, grasshopper, frog, snake, caterpillar, or wolf. **Label each part of the pyramid**

**2. Suppose that the grass has been sprayed with an insecticide. This in turn kills many of the insects and caterpillars.**

1. What are possible effects of the initial loss of insects on the entire ecosystem?

**3. Even though all of the insects weren’t killed they were all exposed to the insecticide and, through bioaccumulation, stored the insecticide in the fats of their bodies.**

**B**. How much pesticide will each1st trophic level consumer take in compared to your producer (hint: think how much food/energy each trophic level needs to consume to survive and how the poison is accumulated NOT eliminated)? Explain.

**C.** How much pesticide will accumulate in the 2nd  trophic level \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**D.** How much pesticide will accumulate in the 3rd  trophic level \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4. Some years ago indiscriminate use of broad range insecticides was blamed on a dramatic decline in the population of Bald Eagles to the point that they were placed on the endangered species list. Scientists determined that these poisons were very long-lived in the environment and over time were leached out of the fields by rain into streams and rivers.**

E. Explain how the insecticides were responsible for the loss of Bald Eagles even though Bald Eagles don’t eat insects, rather their primary food source are Salmon and Trout (second or third trophic level aquatic consumers).