Design an ecosystem to answer the question:

**How does energy flow in an ecosystem to sustain the lives of organisms?**

Purpose: To design and build a closed ecosystem to sustain the life of organisms

Building Materials: Pond water, distilled (fresh water) water, soil, sand, pebbles (small rocks), plant(s), and an invertebrate (fresh water shrimp or a cricket- at this time)

Back ground information: An ecosystem is a community of living things (biotic factors) that interact with nonliving things (abiotic factors) in a specific area. Abiotic factors such as temperature, sunlight, water, and minerals determine which species are able to survive in an ecosystem. Biotic factors, or populations of organisms in an ecosystem, can be classified by their function. Some producers, such as algae and green plants, make their food using sunlight through a process called photosynthesis. Consumers can be carnivores, herbivores, or omnivores. Decomposers, such as fungi and some bacteria, are consumers that break down dead plants and animals to recycle them into nutrients that other organisms can use.

**Add in notes, questions, or ideas from the background information.**

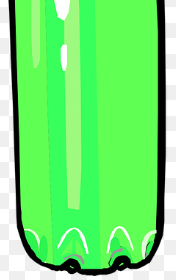
Today you will be considering the abiotic factors in your ecosystem build. Your task is to create a preliminary (first step/rough draft) design of the amounts of each one you would expect to need in your 2 liter bottle ecosystem. Remember this is just the first step in the design process. As you learn and research more about the topic of ecology in your science class you will likely want to redesign before completing your actual build.

Using Volume to Create your Biome- STEAM Assignment 1

The formula used for volume of any 3D shape is **V = (area of the base) x h**

We are going to use this formula to find the volume of your soil/sand, pebbles, and water/air are needed for your habitat.

Step 1: Finding the area of our base:



First, we need to find the shape of our base.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the formula to find the area of our base?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Measure your soda bottle to find your area:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 2: Finding the volume of the soil/sand:

You need to measure the height of soil/sand you want:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

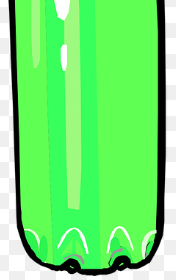
Use your volume formula to find the volume of soil needed:

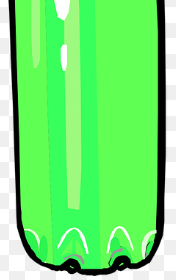
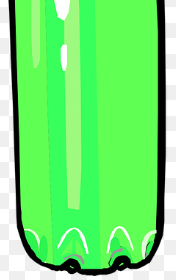
V = (area of the base) x h

= 1 ml

So, how many milliliters of soil/sand is needed?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_





You need to measure the height of air/water you want:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use your volume formula to find the volume of pebbles needed:

V = (area of the base) x h

= 1 ml

So, how many milliliters of air/water are needed?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 4: Finding the volume of the air/water:

You need to measure the height of pebbles you want:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use your volume formula to find the volume of pebbles needed:

V = (area of the base) x h

= 1 ml

So, how many milliliters of pebbles are needed?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 3: Finding the volume of the pebbles: