

## ECOSYSTEM IN A SODA BOTTLE

### SUPPLIES:

- Clear 2-liter soda pop bottle
- 2-3 small plants (e.g., pansies, johnny jump ups) + extra potting soil
- 2-3 goldfish + goldfish food
- Aquarium rocks
- Cotton string
- 2 paper coffee filters
- Hole punch
- Sharp scissors
- Black marker
- 3-4 cups tap water (\*Let sit at room temperature, lightly covered, for 12-24 hours. This releases the chlorine that would harm the fish!)

### To assemble the ecosystem:

1. Start with a clean, clear 2-liter bottle with the label removed. Use the marker to make a line around the bottle just below where the straight sides begin on the bottle. Use a tip of your sharp scissors to poke a hole through the bottle at the line. Use the hole to insert the scissor blades and proceed to cut the top off the bottle. (\*Adult help is suggested!)
2. Add some aquarium rocks (1"+) to the larger bottom half of the bottle. From the top edge, reach down along the side of the bottle and punch one hole. Carefully pour in room temperature water about halfway up the bottle. Gently add your fish, using a small net if possible.
3. Fit two coffee filters together and use a scissor tip to poke a small hole in the center of the doubled filters.
4. Cut a string about 10" long (it will need to reach down into the water with the goldfish). Tie a knot on one end of the string, doing this several times to make the knot a little larger. Thread the un-knotted end through the top of the filter papers, through the little hole you made. The string will stop going through when it comes to the knot, which holds it in place in the filters.
5. Set the filter down inside the inverted (upside-down) top of the bottle that you cut off in the beginning. Make sure the dangling string feeds through the bottle neck.
6. Work with a second person who can hold the bottle top while you place a plant or two, along with the dirt holding the roots, inside the coffee filter. Add a little potting soil to hold the plants upright, then give them a little water if they need some moisture. Allow the water to drain through the bottle neck into a sink ... this water is still chlorinated and you don't want much going into the fish's water! The base of the plants should end up about level with the upper cut edge of the soda bottle.

7. Place the bottle top with plants into the lower part of the bottle holding the goldfish, so that the string dangles down into the water. The bottle top's edge should naturally rest about an inch above the bottle bottom's top edge.

#### **TIPS FOR YOUR ECOSYSTEM:**

1. Feed your fish 1-2 pinches of flakes twice a day. Push flakes through the punched-out hole, or very carefully remove the top and scatter the food in.
2. Use a plastic straw to aerate the water once a day. Just place the straw into the water and gently blow some bubbles. Be careful not to suck any water up!
3. Every 3-4 days, remove the top, place it in a sink, and water your plants; let excess water drain through the hole. Remove your fish and place them in a small bowl with room temperature, dechlorinated water. Rinse the aquarium rocks and drain dry on paper towels. Empty the dirty water and rinse the bottle thoroughly. Place the rocks back in the bottle, add room temperature, dechlorinated water, then add the fish!
4. Keep your ecosystem in a place where it can get indirect sunlight.

#### **SCIENCE BEHIND THE ECOSYSTEM**

Life in an ecosystem is interconnected. It includes living things (like plants and fish), and non-living things (like soil, rocks, air, sunlight and water). Each living thing affects the other living things in the system. In your bottle ecosystem, the water, rich with nutrients from the fish, will wick up the string to water your plants. Make sure your fish get food daily so that they can continue to deposit nutrients into the water that helps to keep the plants moist and fertilized.

To watch this project being make, check out the Homeschool: Earth Day video [Here](#).

