

# Eco Column

**Overview** What grows in the corner of your windowsill? In the cracks in the sidewalk? Under the front steps? In the gutter at the bottom of the driveway? Specifically, *how* do these animals build their homes and how much space do they need? What do they eat? Where do fish get their food? How do ants find their next meal? Organisms exist in relationship to one another. It is difficult to know how they exist—how they find shelter, what they eat, how long they live—until you observe them.

**What to Learn** In this lab, you'll get to observe and investigate the habits and behaviors of your favorite animals by building an Eco Column. This column will have an aquarium section, a decomposition chamber with fruit flies or worms, and a predator chamber, with water that flows through all sections. This is a great way to see how the water cycle, insects, plants, soil, and marine animals all work together and interact.

## Materials

- four (or more) 2-liter soda bottles, empty and clean and with caps
- scissors
- tape
- razor with adult help
- ruler
- soil
- water
- plants or seeds
- compost or organic/food scraps
- spiders, snails, fruit flies, etc

## Experiment

1. Cut bottle #1 2 cm below the shoulder. Start the cut with a razor, and finish it with scissors.
2. Drill a hole in the cap and poke holes in the side of the bottle for drainage for soil.
3. Cut bottle #2 1 cm below the hip.
4. Carefully measure 1 cm below the shoulder of bottle #2 and cut all the way around. The lip of this cut should be straight.
5. On bottle #3, measure 1 cm below the shoulder and cut all the way around.
6. Cut 2cm below the hip of bottle #3. You want this end tapered.
7. Put a cap on bottle #3.
8. Shove through the tapered bottom, so it sits an inch up from the bottom.
9. Cut bottle #4 1 cm above the hip.
10. Put the whole column together: Put bottle #1 top into bottle #2 middle, slide the above section into bottle #3, insert the last bottle cut upside down, and put the remaining bottle bottom on the whole apparatus.
11. Once the whole Eco Column is together, number each section so you can quickly and easily reassemble it, once you fill each section.
12. Take the sections apart and fill them as follows: bottom section is aquarium so fill with water. The next is the decomposition unit—put in plant matter, small amounts of fruit for the fruit fly breeding ground. Then

is the plant/animal chamber—fruit flies. You can cut a port hole that tapes shut in the side of this section, for easier access. Finally is the precipitation funnel—allow water to drip down the column

13. Create a data table.

### Eco Column Data Table

Date	Organism	Behavior

## Reading

Animals are all around us. As we walk through our neighborhood, we likely see animals being kept as pets, insects crawling on the ground, and birds flying through the trees. Depending on where you live, you may also see animals living in rivers, lakes, and swamps. How are these animals similar? How are they different? Why do they behave in the ways they do? How do their actions affect the environment in which they live? These are big questions that we'll be answering.

You will get to observe and identify the behaviors of various plants and animals in various components of an ecosystem: the aquarium, the decomposition unit, the plant/animal chamber, and the precipitation funnel. You can also identify the role of different plants and animals in their eco column: producers, consumers, and decomposers. Specifically, look for how animals eat plants or other animals for food, if they use plants or even other animals for shelter and nesting; producers and consumers (herbivores, carnivores, omnivores, and decomposers) and how they are related in food chains and food webs. Also see if you can determine how they compete with each other for resources in an ecosystem, and how matter is transferred from one organism to others in the food web over time. You'll want to get a feel for the relationships between the organisms and the physical environment in the big picture.

## Exercises

1. What are parts of the eco system?
2. Give an example of each.
3. What do decomposers do?
4. How do fruit flies breed?
5. How does the precipitation funnel function in this eco column?

**Answers to Exercises: Eco Column**

1. What are parts of the eco system? (Water, producers, decomposers, consumers)
2. Give an example of each? (Water-precipitation from rain water; producers-fruit; decomposers-fruit flies; predators- insects).
3. What do decomposers do? (Decomposers eat plant matter and turn it into waste, thereby decomposing the plant).
4. How do fruit flies breed? (Fruit flies feed on ripe fruit. They lay their eggs in the skin of fruit. They have a very quick life cycle— about 8 days).
5. How does the precipitation funnel function in this eco column? (Water drips in from the top, providing water for the eco column).