

## Section 1

### Understanding Life Systems

# EXPLORATION 2

## An Ecosystem in a Bottle

Investigate the relationships between the elements in an ecosystem.

An ecosystem is a community of living and non-living things found in a particular area. Within an ecosystem, no matter how small or seemingly unimportant, each element plays a significant role. Plants, animals, and organisms interact with one another as well as with their environments, such as the soil and the sun, for their survival.

The sun, algae, crabs, squids, and seals in an ocean are all part of a food chain. If, for example, there were no seals to hunt squids, this ecosystem would be disrupted. The resulting overpopulation of the squids could lead to excessive hunting of the crabs, thereby significantly reducing the crab population. And without the crabs to feed on them, the algae would overpopulate, severely reducing the oxygen in the water, and the life of marine animals would be at stake. Therefore, all elements in an ecosystem are important and it is their interactions that allow for a well-balanced ecosystem which is critical to all life forms.



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# An Ecosystem in a Bottle

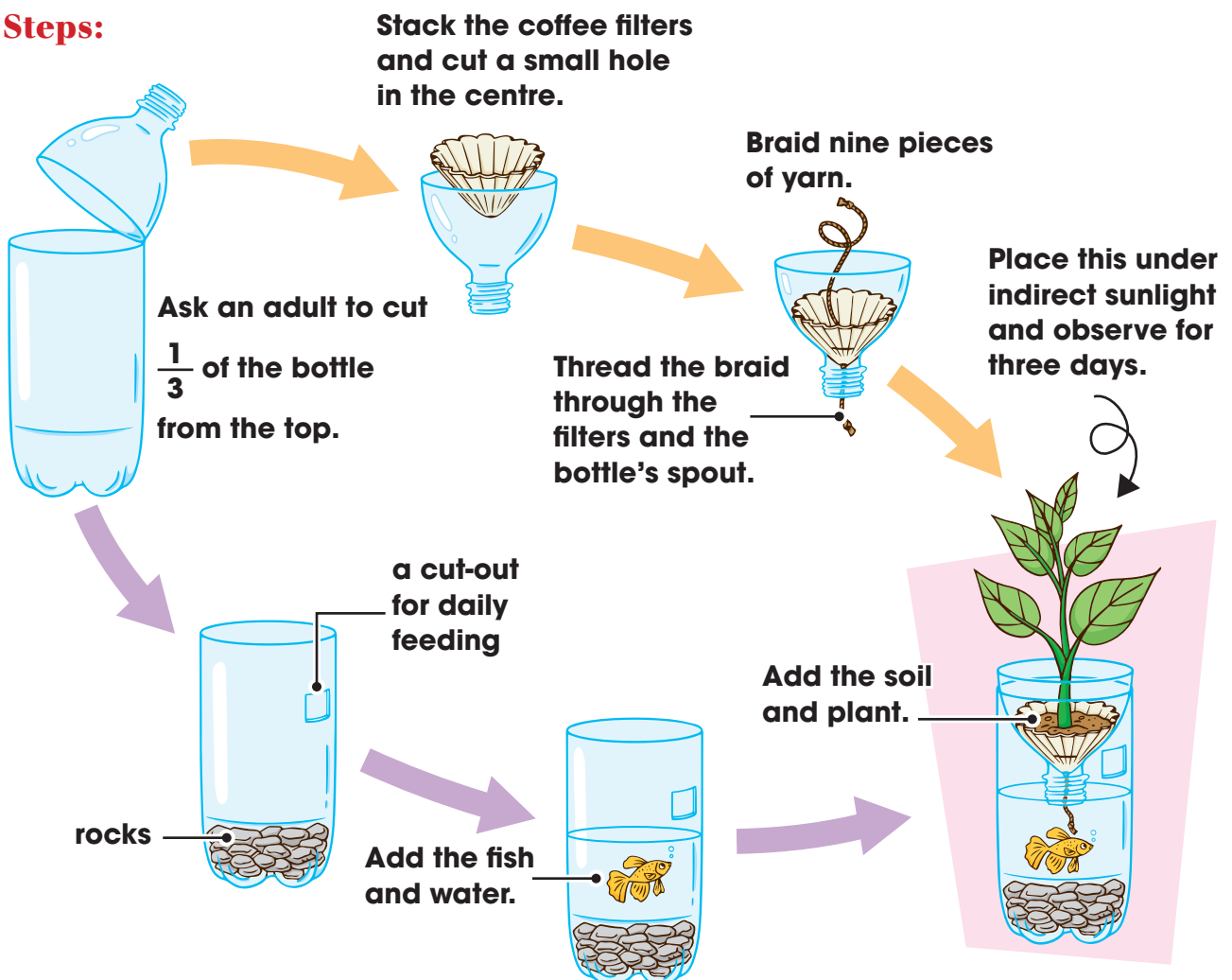
Try this activity to explore the relationships between living and non-living things and how they contribute to a self-sustained and balanced ecosystem.

### Materials:

- a pet fish (e.g. betta or goldfish)
- fish food
- a small plant
- cotton yarn
- a plastic bottle
- 2 coffee filters
- rocks and soil

Get your family's approval to get a pet fish and take good care of it.

### Steps:



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# EXPLORATION 2

## An Ecosystem in a Bottle



In this activity, can you see what elements are present to make this ecosystem self-contained? In this ecosystem, the water not only keeps the fish alive by providing it with rich nutrients from the decomposition of the fish food and the fish waste but also supports the plant by being wicked up through the the braid of yarn toward the soil. The plant produces its own food using sunlight through the process of photosynthesis. The sun also provides the fish with a natural heat source to keep the water in the bottle warm.

Water, sunlight, air, and fish food are all the components for the ecosystem to be self-sustained. If any one of these elements is missing, the balance will be thrown off. Then the living things will suffer and eventually die.