

## Ecosystems, Up Close and Personal

By Peggy Ashbrook

Science learning may sometimes feel far removed from the subject of the information—the natural world. Reading about an ocean ecosystem, ordering butterfly larvae from a catalog, and watching a video of a sprouting seed are all actions that I have taken, but they are nothing like actually swimming in an ocean, discovering a caterpillar in the garden, and using photography to document the growth of a seed that I planted. Children and adults need actual experiences with the natural parts of an ecosystem to begin understanding this complex idea.

After an experience in nature, watching a video clip about butterflies drinking nectar from a flower adds to my understanding of the natural world. Making a connection between my experience in nature and information from other sources can generate questions that expand the initial exploration into science inquiry about a science concept, such as the relationships between plants and animals. The *Next Generation Science Standards (NGSS)* state that kindergarten students are expected to use observations to describe patterns of what plants and animals (including humans) need to survive (NGSS Lead States 2013; see Internet Resource). Children’s observations are their data, and evidence for their beginning ideas about how animals get their food and what plants need to survive.

An investigation of a plant growing in the school yard is a first step into understanding how one plant can fit into a larger system—an ecosystem. By planting seeds in a large pot outside or in a garden bed, children can follow a plant through its life cycle and build understanding of how a plant fits into a larger system over time. Plant fennel (*Foeniculum vulgare*), an edible seed that grows into an edible plant with a strong smell, and all of children’s senses can be used to make observations. Observations of the texture of the soil and any small animals (e.g., grubs and worms) found in it while planting, the amount of sunlight, and the weather are all part of understanding the environment the plant will grow in. This is a cultivated environment, not a native species ecosystem. By observing, documenting (with drawings, photos and dictation), and talking about the small animals in the soil and on the plant and how they live, children begin to build an understanding that the lives of plants and animals are intertwined—and also intertwined with the nonliving (abiotic) parts of the environment, the soil, water, and sunlight. ■

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### Reference

NGSS Lead States. 2013. *Next Generation Science Standards: For states, by states*. Washington, DC: National Academies Press. [www.nextgenscience.org/next-generation-science-standards](http://www.nextgenscience.org/next-generation-science-standards).


### Internet Resource

NGSS Table: K-LS1 From Molecules to Organisms: Structures and Processes [www.nextgenscience.org/cls1-molecules-organisms-structures-processes](http://www.nextgenscience.org/cls1-molecules-organisms-structures-processes)

## Observing Fennel From Seed

### Objective

Children will observe and document the growth of a plant from a seed to seed-production as well as any animal interactions with the plant.

1. Read nonfiction books and lesson plans about ecosystems to prepare yourself for exploring plant and animal relationships in your own program at a developmentally appropriate level (see NSTA Connection).
2. Have students handle and look closely at the fennel seeds using hand lenses. Have the group discuss where they will plant the seeds and what care they may need to provide for a plant. Where the seeds will be planted begins the discussion about what an ecosystem is and how a single plant fits into the larger system.
3. At snack time, allow children to taste a few fennel seeds intended for culinary use. Check with parents for food allergies. Encourage children to talk about other seeds they eat, such as sunflower and poppy seeds, but remind students they should never eat unknown seeds. Discuss how humans use plants for food. 
4. Have students plant seeds in the spring when the soil warms to 65°F and they can observe the seedling growing over the summer. Seeds can be planted inside but must have full sun to grow best and must be outside to be part of a natural ecosystem. Note: In some areas, fennel can seed itself and be-



PHOTOGRAPHS COURTESY OF THE AUTHOR

### Materials

- Fennel (*Foeniculum vulgare*) seeds (alternative: parsley seedlings) to plant
- Fennel seeds sold for culinary uses
- Large flower pot and soil or garden space
- Hand lenses

come invasive in the wild (see Internet Resources). Be sure to remove all seeds when they form. An alternative to fennel is parsley which does not spread as readily. In this case, begin with parsley seedlings; parsley is difficult to start from seed.

5. Begin data collection by having children describe the texture of the soil and any small animals or bits of dead plants found in it while planting and then draw the garden or planted pot. This is their first observation of this small part of the ecosystem. Children's daily observations of the amount of sunlight, the weather, and any visible plant growth can be recorded in a calendar or science notebook.
6. As the plant sprouts and grows, children can measure the growth of plant leaves, stems (up to 2 meters tall), and development of flowers and seeds. Have children draw what they know about the relationship between the fennel and bees, butterflies, and other small animals.

Take nature walks in the neighborhood around the school and make observations of the larger ecosystem. Investigate questions such as, "Which plants do you think were planted by people and which grew by themselves?" "What plants grow where there is shade and where is there sun?" and "Are animals using the plants?" Have children look for the parts of the local ecosystem.

### Internet Resources

Bureau of Land Management: Sweet Fennel (*Foeniculum vulgare*)  
[www.blm.gov/ca/st/en/fo/hollister/noxious\\_weeds/nox\\_weeds\\_list/sweetfennel.html](http://www.blm.gov/ca/st/en/fo/hollister/noxious_weeds/nox_weeds_list/sweetfennel.html)

Kitchen Gardener Magazine: How to Grow the Herb Fennel  
[www.vegetablegardener.com/item/4285/how-to-grow-herb-fennel](http://www.vegetablegardener.com/item/4285/how-to-grow-herb-fennel)

### NSTA Connection

Visit [www.nsta.org/SC1403](http://www.nsta.org/SC1403) for a list of trade books and additional resources. For more early childhood resources visit the Early years blog, [www.nsta.org/earlyyears](http://www.nsta.org/earlyyears).