UNIT OVERVIEW

The world is full of many types of plants. Plants have common needs and parts, but they also differ in many ways. The Plants unit helps students explore what plants require for survival, how plants grow, how people and other animals use plants, special types of plants, where different kinds of plants can be found, and other plant-related topics.

Certain reading resources are provided at three reading levels within the unit to support differentiated instruction. Other resources are provided as a set, with different titles offered at each reading level. Dots on student resources indicate the reading level as follows:

- low reading level
- middle reading level
- high reading level

THE BIG IDEA

Many aspects of our lives are affected by or dependent upon plants. In addition to learning about plants, students may gain an appreciation for the amazing diversity of plant life on Earth and the extensive roles that plants play in their lives.

Other topics

This unit also addresses topics such as: food from plants, dangerous plants, city gardening, giant sequoias, and plant defense mechanisms.

SPARK

The spark is designed to get students thinking about the unit's topics and to generate curiosity and discussion.

Materials

- one living plant
- art paper
- coloring materials

Activity

Display a plant for all students to see. Invite the class to describe as many things as possible about the plant. Record responses on butcher paper or the whiteboard. Once the list is complete, ask students whether there is anything they would like to learn about the plant. Record their questions to use for possible future investigations. If desired, you can repeat this activity with other plants, including trees, near the school. As an extension, you may wish to have students compare two or more plants.

Many of the unit's vocabulary terms are related to the spark activity and can be introduced during the spark. For vocabulary work, see the Vocabulary section in this *Unit Guide*.

PRIOR KNOWLEDGE

Invite students to explain their understanding of plants and plant parts.

Probing Questions to Think About

Use the following questions to have students begin thinking of what they know about plants.

- What do plants need to live?
- Where do plants live?
- What are the parts of a plant?
- What do plants look like?
- What do plants feel like?
- Do plants move?
- How do animals use plants?
- How do people use plants?
- Can you imagine a world with only one kind of plant?
- What if plants could only be found in one place?

Tell students they will learn more about these topics soon.

UNIT MATERIALS

Each unit provides a wide variety of resources related to the unit topic. Students may read books and other passages, work in groups to complete hands-on experiments and investigations, discuss science ideas as a class, watch videos, complete writing tasks, and take assessments.

Resources are available for printing or projecting, and many student resources are also available for students to access digitally on Kids A-Z.

Selected unit resources are available in more than one language.

For a complete list of materials provided with the unit, see the Plants unit page on the Science A–Z website.

VOCABULARY

Use the terms below for vocabulary development throughout the unit. They can be found in boldface in the *Nonfiction Book*, the *Quick Reads*, and/or other unit resources. These terms and definitions are available on *Vocabulary Cards* for student practice. Additional vocabulary lists are provided in the teaching tips for *Investigation Packs* and *FOCUS Books*.

Core Science Terms

These terms are crucial to understanding the unit.

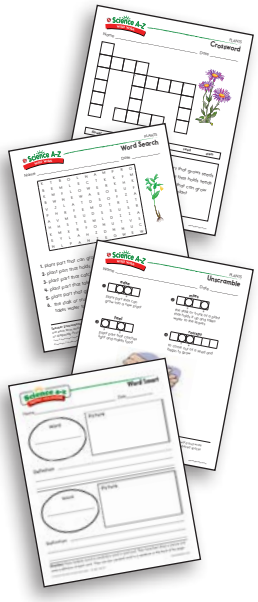
flower	plant part that grows seeds
fruit	plant part that holds seeds
leaf	plant part that catches light and makes food
plant	a living thing that does not move on its own and makes its own food using sunlight
roots	plant part that takes in water and nutrients and holds the plant in place
seed	plant part that can grow into a new plant
sprout	to come out of a seed and begin to grow
stem	the stalk or trunk of a plant that holds it up and takes water to the leaves

Other Key Science Terms

The following vocabulary is not essential for comprehending the unit but may enrich students' vocabulary.

bloom	to open into a flower
cactus	a desert plant with spines
cellulose	material in plants used for making paper
nectar	sweet liquid in flowers
nut	a hard, dry fruit with only one seed
pulp	the soft part inside a plant's stem or fruit
reproduce	to make a new plant
ribs	the wood in a cactus that holds it up and protects it
soil	top layer of the ground where plants can grow
spines	sharp, pointy leaves on many kinds of cactus

Vocabulary Activities



You may choose to introduce all the terms that will be encountered in the unit before assigning any of the reading components. *Vocabulary Cards* with the key science terms and definitions are provided. Dots on the cards indicate the reading levels of the *Nonfiction Book* or the *Quick Reads* in which each term can be found. If all level dots appear, the term may come from another resource in the unit. Students can use these cards to review and practice the terms in small groups or pairs. The cards can also be used for center activity games such as Concentration.

The *Word Work* activity sheets offer fun puzzles and practice with key vocabulary terms from the unit. For further vocabulary practice and reinforcement, you can choose from the vocabulary *Graphic Organizers*. To build customized vocabulary lessons with terms related to the topic, see Vocabulary A-Z.

Students can use the *Word Smart* vocabulary *Graphic Organizer* to organize information on the science terms. You may want to assign each student one to three words to share his or her *Word Smart* knowledge with classmates. Students who have the same word should first compare their *Word Smart* sheets with each other and then report to the larger group.

The science terms can be used in oral practice. Have students use each term in a spoken sentence.

As students read, encourage them to create a science dictionary by recording new vocabulary terms and definitions in their *SAZ Journal*.

BACKGROUND AND MISCONCEPTIONS

Use this section as a resource for more background knowledge on unit content and to clarify the content for students if misconceptions arise. Refer to Using the Internet below for more ways to extend the learning.

Q: *Do plants "eat" soil as food?*

A: No. Plant roots absorb water and minerals from the soil, but this is not the same thing as eating food. Plants make their own food (sugar) during photosynthesis. The matter (water and carbon dioxide) and energy (light) that plants use during photosynthesis are not considered food. Minerals help plants carry out photosynthesis and other important processes, but they are not considered food either.

Q: *How does that big plant come out of that tiny seed?*

A: Students may believe that the material of plant growth comes from the soil. If this were true, the soil in a flowerpot or on a forest floor would gradually disappear. A small amount of plant matter does come from nitrogen and other minerals that plants get from soil. However, most plant matter comes from water and carbon dioxide, a gas plants get from air.

Q: *Do plants breathe or drink?*

A: No. Breathing is specifically a behavior of an animal with lungs or gills. Plants do absorb carbon dioxide and give off oxygen, but this is not called breathing. Drinking is also an animal behavior. Plants do transport water within their vascular systems, but they do not drink as animals do.

Q: *Are all plants green and small?*

A: No. Plants come in all sizes, and they are not always green (for example, rhubarb stems are red). Students sometimes think that plants have to be small and green, so they conclude that trees are not plants, especially when they grow big. In fact, trees are plants, and countless varieties exist.

Q: *Aren't fruits and vegetables different from each other?*

A: It depends on the context. The terms *fruit* and *vegetable* are often used to describe types of foods that come from plants. As foods for humans, vegetables are often distinguished from fruits by their lack of sweetness. But scientifically speaking, many vegetables, such as cucumbers and pea pods, are actually fruits. This is because they contain the seeds that allow the plant to reproduce. Other plant parts are also used as vegetables, such as the roots (potatoes, carrots), leaves (lettuce, spinach), stems (rhubarb), and flowers (broccoli, asparagus tips) of certain plants.

EXTENSION ACTIVITIES

Using the Internet

Most search engines will offer a wealth of options when *plant education* or the name of a plant species is entered. Try searching by species or location, or pairing the word *plants* with related terms from the unit. Be aware that some sites may not be educational or intended for the elementary classroom. More specific inquiries are recommended, such as:

- plant parts
- Kentucky plants
- what plants need
- plants of South America

Projects and Activities

- **Writing:** Write a class list of instructions for how to care for plants in general or one plant specifically.
- **Writing:** Have groups of students write a menu, including for breakfast, lunch, dinner, dessert, and beverages, that is only made up of foods from plants. Remind students that people who choose to only eat plants are called *vegetarians.* (Animals that naturally eat only plants are called *herbivores.*)
- **Arts/Writing:** Combining one distinctive feature from a few different plants, have each student draw and name their new plant (for example, the thorny sunflower rose tree). They may also enjoy writing or dictating a story or poem about it.
- **Arts:** Decorate a classroom door as a plant or as a montage of plants.
- **Project:** Plant a class garden using seeds known to grow well in your area and at the current time of year. Hold a class vote to select plants. Have students keep a growth log with pictures, measurements, and observations as the plants grow. If edible plants are included, schedule a day to enjoy the "fruits" of your labor.
- **Project:** Build a mock plant-rich environment in the classroom, such as a forest, desert, rainforest, grassland, or farm. Or create zones within the classroom to represent the different plant regions.
- **Field Trip:** Plan a trip to a local nursery, botanical garden, forest, farm, or nature preserve. Take photos or provide art materials so students can create pictures of their favorite plants. Back in class, display these on a bulletin board. Use them for practice in labeling plant parts and comparing plants from different areas.
- **Arts:** Students can create mobiles, dioramas, or posters displaying information about their favorite plant. Research can be conducted as a family/home project or in the library/media center.
- **Research/Home Connection:** Students can conduct research as a family/home project or in the library/media center to extend the learning about a topic in one of the *Quick Reads* or other unit resources.