

## ADVISORY 1, UNITS 1-2, LESSON 5 CELLS AND BODY SYSTEMS

### Summary

- In this lesson, students will read "Out on a Limb" (pp. 56-63) and "Hidden Lives of Leaves" (pp. 64-69) to understand how a tree's parts, including the cells that carry out photosynthesis, allow it to live and grow.

### Science Background

A tree is a type of plant with a woody stem. As the stem grows, it turns into a trunk. The trunk is covered with a protective layer of bark. This allows the tree to live for a long time.

Most trees grow from seeds, and there are two main types of trees that produce seeds: gymnosperms and angiosperms. Gymnosperms grow seeds inside cones. Angiosperms produce flowers. The flowers grow into fruits, which are full of seeds.

All trees have the same basic parts: roots, trunk, branches, bark, and leaves. Roots bring up water and nutrients from the soil. They also anchor the tree into the ground. Branches and the trunk provide additional support. They also create a network for the tree to transport water and nutrients up from the roots. Bark provides protection. And the leaves are where the tree makes its own food.

The process in which a tree or other plant makes food is called photosynthesis. During photosynthesis, leaves use energy from sunlight to combine water and carbon dioxide. This reaction, which takes place inside cells called chloroplasts, creates sugar and oxygen. The sugar provides energy so the tree can live.

### ENGAGE

Encourage students to flip through the articles and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about photosynthesis and the parts of a tree.

### EXPLORE

Instruct students to examine the diagram of tree parts on page 58 of their Readers. **Ask:** *What tree parts do you see in each photo?* (leaf and seed, branches and trunk, bark, roots) Brainstorm examples of how these parts can look different on different types of trees.

### EXPLAIN

Point out to students that all trees have the same parts. And each part has a specific function that helps the tree survive. **Ask:** *What do roots do?* (pull up water and nutrients from the soil; anchor trees in the ground) *Which part protects trees from insects and other harm?* (bark) Have students turn and talk as they review the articles for details about the structure and function of each tree part. Then challenge students to summarize the process of photosynthesis. (A leaf turns sunlight, water, and carbon dioxide into sugars and oxygen.) Encourage students to turn and talk as they discuss the connection between leaf structure, leaf patterns, and photosynthesis. (Large leaves grow far apart. Small leaves grow close together. Some leaves spiral around stems, and others have notches or cutout edges. Each of these characteristics allows the tree to get as much sunlight as possible.)

### ELABORATE

Invite students to read the National Geographic Education article "Sweet Secret" ([www.nationalgeographic.org/news/sweet-secret/](http://www.nationalgeographic.org/news/sweet-secret/)) to learn what plant leaves have to do with the solar energy panels on the White House.

### EVALUATE

Have students complete the **Content Assessment** for this lesson. Encourage them to share and compare their results in small groups.

**CONTENT ASSESSMENT: Cells and Body Systems, Lesson 5**

Create a diagram of a tree. Label its parts. Then explain how the parts work together to help the tree survive.

Draw	Explain
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Create a diagram to illustrate the process of photosynthesis. Explain how it works.

Draw	Explain
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