

## LESSON 6 What Are The Main Groups Of Plants? =====

### Objectives

When students have completed this lesson, they will be able to:

- distinguishing between vascular plants and nonvascular plants;
- classify mosses and liverworts as nonvascular plants;
- classify ferns, conifers, and flowering plants as vascular plants.

### Exploring Science / Historical Steps

Even stranger than a fruit-salad tree is the fact that a tomato plant can be grafted onto a potato plant, making a sort of vegetable-salad plant. Most grafts, however, are between members of the same genus - that is, quite closely related species. Yet the graft does not always “take,” even when the species are of the same genus.

An important example of a graft that does take is the use of lemon-tree stock with orange-tree scions (the term that applies to the branch that is grafted to the stock, which has roots). Most of the oranges that we eat are grown in this way. Students should answer “possible” to the inference question, which refers to the grafting of orange branches to lemon trees.

You may want to explain that Burbank usually reproduced plants that he wanted to improve by first breeding hybrids (described in this book in Lesson 3 of Unit 9). He would select those offspring that had the best qualities, and use them for grafting. Burbank is responsible for the development of over 800 different species of fruits and flowers. Breeders all over the world are still using his methods of improving plants.

### The Plant Kingdom

Any students who have cared for plants will appreciate the importance of water to plants. Except for some desert species, most house plants and home garden plants require frequent watering. You may want to explain that nearly all of the water passes right through the plant and goes into the air - a process called transpiration. This process is a key means by which plants lower their temperature.

Have students recall the water cycle (Unit 1, Lesson 4, page 14), in which all organisms have a part. For land plants - especially the vascular plants - transpiration pulls enormous amounts of water from the ground into the air. [In Unit 3 Lesson 1 the vital role of hydrogen bonds and cohesion are introduced.]

Stress to students that it takes “true” roots to move water from deep in the earth. The lack of real roots is what places mosses and liverworts in a separate group (phylum) from ferns and other higher plants. Nonvascular plants must live where there is plenty of moisture on or very near the surface. Because they lack water tubes, they cannot grow very tall.

While it is not mentioned in this book, you might inform students that non-vascular plants reproduce with spores (similar to the spores of molds). Spores are also the means by which the first category of vascular plants - the ferns - reproduce.

Beginning with the ferns, plants that have both roots and water tubes are able to grow tall. In past ages, as well as in some tropical areas of today, tall ferns called tree ferns grew. These plants are not the tallest in our forests today, however, because their method of reproduction by spores (rather than seeds) requires the presence of moisture.

Conifers and flowering plants, which are the other two phyla of vascular plants, are seed-bearing. Their method of reproduction does not require moist conditions at all times. Thus, these plants dominate the land where the climate is not usually moist. Depending on the student population, you may want to introduce the terms angiosperm and gymnosperm, and share the meaning of the terms angio (container), gymno (naked) and sperm (seed).

### Review

*Please note: I have not made the answers available online, on the small chance that a student might discover them. Of course, the answers to these questions will be included in the version of the Teacher's Guide provided to teachers who purchase the text.*

## Reinforce / Enrich

Most videos on classification deal with specifics of plant structures that, in this textbook come later. From the 3:14 to 7:00 mark, the following video presents plant classification in a way that rather closely mirrors the textbook. However, as with most videos, the term *gymnosperm* is used for the conifers, and the term *angiosperm* for the flowering plants.

- [Miacademy and MiaPrep Learning Channel](#)  
[9:20]

This might be a good time to introduce students to their local trees - and to the use of dichotomous keys. If you live in the eastern U.S. you might want to consider the [dichotomous key unit](#) that I put together. (The **To Do Yourself** activity of the next lesson introduces students to a dichotomous key to the major vertebrate classes).