

## GETTING TO KNOW THE GYMNASPERMS

### Summary

*What are gymnosperms and conifers? What are some features that are useful for identification?*

This lesson introduces students to the group of plants known as the gymnosperms. Background reading and a hands-on activity provide the students with a basic knowledge of the group and some features used in identification.

### Objectives

Students will:

- know the major features of gymnosperms and conifers
- draw and describe the cones, twigs, seeds, and uses of various gymnosperms
- be able to classify a plant by family and genus

### Materials

- photocopies of the **Getting to Know the Gymnosperms** reading
- photocopies of the **Getting to Know the Gymnosperms** worksheet
- plant material: cones, twigs, seeds (and whatever else is available) of various gymnosperms (you will need to collect these in the outdoors unless other sources of material are available)
- **Station Information Sheets** (one or two copies/station)

- dissecting microscopes
- rulers
- hand lenses or magnifying glasses
- dissecting kits
- examples of gymnosperm products (refer to the **Forest Products** page for details)

### Setting

Classroom

### Duration

60 - 80 minutes

### Key Terms

- gymnosperm
- conifer
- cone

### Making Connections

Many students have probably seen gymnosperms before, but they may only know the common names or may have misconceptions about the plants. This lesson gives every student a chance to observe and inspect gymnosperms closely. The knowledge that they gain from this lesson will be useful in the rest of the unit and will be useful when they see these plants in their everyday lives.

## **Background**

Please refer to the **Getting to Know the Gymnosperms**.

(The students may be wary of learning the scientific names of these plants. However, this is a very useful skill and will benefit them in the long run, so please make the effort to teach the students the correct names and *spellings*.)

## **Procedure**

### ***Warm Up***

1. In class or as a homework assignment the night before, have students read **Getting to Know the Gymnosperms**
2. Hold a brief discussion with students to review the key terms from the reading and to gain a sense of what they already know about gymnosperms and conifers.

### ***The Activity***

1. Set up stations around the classroom. Ideally, there will be a Cone Station, Twig Station, Seed Station, and Product Station. If you are not able to find seeds, for example, there are resources available with pictures of seeds that can be substituted for the actual material. Each station should include plant material (or pictures) from about 5 different genera of gymnosperms that can be found in the local area,

a Station Information Sheet, rulers, dissecting microscopes, hand lenses, and dissection kits.

2. Label all of the plant samples with numbers instead of names. For example, label all of the samples (the cone, the twig, the product, the seeds) collected from a pine tree #1, all samples from a hemlock #2, etc.

3. Make an answer key for yourself by completing a **Getting to Know the Gymnosperms Worksheet** for each different gymnosperm and recording the name of the gymnosperm and corresponding sample number that you have assigned to it. (this answer sheet will be used later in the activity).

4. Assign students a Sample Number (1, 2, 3, 4, or 5).

5. After being assigned a Sample Number, the students will move around the stations that have been set up. If a student has been assigned Sample Number 1, he/she must examine the cone that is labeled #1, the twig that is labeled #1, the seeds that are labeled #1, and the product that is labeled #1. The students will complete the **Getting to Know the**

**Gymnosperms Worksheet** as they circulate among the stations.

6. After the students have visited each station and have made their observations, they need to find out the names of their samples. You should read (or post) your observations from the answer sheet that you completed earlier. Students need to compare their observations to the answer sheet in order to figure out what plant they studied. For example, if you say that a pine tree (*Pinus*) has needles in bundles, the student whose own observations match that description would know that he/she studied a pine and will record that on the worksheet. (Provide students with the common name *and* scientific name of each genus)

If a student has not made good observations during the activity, then they will probably not be able to figure out what plant they have. In this case, allow more time for observations and assist the students in making quality observations.

#### *Modifications*

Instead of giving the students the **Getting to Know the Gymnosperms** worksheet, have them make their observations

without being asked specific questions. See what sorts of things they would look for if not prompted by the worksheet questions.

#### *Wrap Up*

- End the activity with a brief discussion about the gymnosperms that the class studied during the activity. Did anyone know the sample right away? Had anyone seen the cones or twigs or seeds from the samples before? Does anyone know where to find more samples of gymnosperms?
- Add the key terms to the word wall.
- Begin to classify gymnosperms into families and genera by making a gymnosperm bulletin board (see **Gymnosperm Bulletin Board** sheet for instructions).
- Start **Gymnosperm Journals** (see **Gymnosperm Journal - Teacher's Guide** for more information)

#### **Assessment**

The worksheets may be collected and graded.

#### **Extensions**

Encourage students to collect material from gymnosperms and

bring that material into class for use in later lessons and study.

### **Resources**

- University of Hawaii,  
Coniferophyta - Coniferales  
[http://www.botany.hawaii.edu/faculty/webb/Bot201/Conifers/conifer\\_lecture.htm](http://www.botany.hawaii.edu/faculty/webb/Bot201/Conifers/conifer_lecture.htm)
- Irving Forest Discovery Network  
[www.ifdn.com](http://www.ifdn.com)
- Maine Forest Service  
[http://www.maine.gov/doc/mfs/pubs/ftm/ftm\\_sw.htm](http://www.maine.gov/doc/mfs/pubs/ftm/ftm_sw.htm)
- FAO Corporate Document  
Depository, Non-wood forest products from conifers, Chapter 10  
<http://www.fao.org/docrep/X0453E/X0453e14.htm>