

PLANT MATERIALS

Lesson 11: TREES

I. LESSON DESCRIPTION

Students watch a slide show of 10 tree portraits, and then answer a brief quiz on some of their features. *Estimated time requirement for this lesson is 23 minutes.*

Curriculum Standards: Minnesota Academic Standards in Science, Minnesota Department of Education, 5-24-10, Grades 9-12:

- 9.4.2.1.2* "Explain how ecosystems can change as a result of the introduction of one of more new species. For example: The effect of migration, localized evolution or disease organism."

National Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards, National Council for Agricultural Education, 2009:

- AFNR LifeKnowledge® and Cluster Skills Standards (CS):
 - CS.01.01.01.a. Work productively with a group or independently.
- Natural Resource Systems (NRS):
 - NRS.01.02.01.a. Describe morphological characteristics used to identify trees and other woody plants.
 - NRS.01.02.01.b. Identify trees and other woody plants.
- Plant Systems (PS):
 - PS.01.01.01.a. Explain systems used to classify plants.
 - PS.01.01.02.a. Describe the morphological characteristics used to identify agricultural plants.
 - PS.01.01.02.b. Identify agriculturally important plants by common names.
 - PS.01.01.02.c. Identify agriculturally important plants by scientific names.

Minnesota offers a wide variety of trees, large and small, broadleaf and needle-leaved, deciduous and coniferous.

Student Learning Objectives: After completing this class, students will be able to recognize and name 10 common trees the next time they see them in the landscape.

Instructional Methods: Informal Lecture, Presentation, Quiz.

II. LESSON PLAN

Introduction

Legend:

Text in normal face - Represents teacher's words.

Text in italic face - Represents suggestions for the teacher.

Interest Approach:

- QUESTION: What roles do trees play in the larger scheme of nature?
- ANTICIPATED RESPONSES: *(Students provide opinions for a minute or two.)*
- ANSWER: Trees play a major role in the beauty of our landscapes and gardens. They offer interesting leaf patterns and flowers that are beautiful and sometimes fragrant. Some trees offer wood so we can build shelter. They shade us from the hot summer sun. They provide food and medicine. Additional roles of trees are to act as a privacy screen, windbreak, and air filter. Trees are also important for defining space in landscapes (walls and ceilings) and framing structures. Trees also provide valuable habitat for wildlife.
- Building familiarity with the trees that grow in Minnesota, you build a foundation that will help you design your own garden, and set you on the right foot in taking care of those trees. Before you can address the needs of a specific plant, you need to identify it.

Relevancy:

- In this lesson we'll view common trees.

Learning Objectives:

- After attending this class, you will be able to name common trees the next time you see them in the landscape.
- Now let's move into a study session on a few Minnesota trees.

Instructional Methods

Brief informal lecture on naming plants: 5 minutes estimated

- Before we look at some trees, we need to discuss how plants are named. It is important that nursery professionals be able to identify plants using both scientific and common names.
- The scientific name, or Latin name, consists of at least two names: the name of the genus to which the plant belongs; and the specific epithet. Together the genus name and the specific epithet make up the species name. The first letter of the genus name is always capitalized; the first letter of the specific epithet is lower case. The species name is then either printed in italics or underlined but not both. In addition, each plant has at least one common name, which may or may not reflect the true Latin name. The cedar of Lebanon, *Cedrus libani*, is a true cedar; the common name is cedar of Lebanon, while *Cedrus libani* is the scientific name. Consider the confusion when the common name “cedar” is applied to plants that are not in the genus *Cedrus*. For example, the western red cedar is a member of the genus for arborvitae: the Latin name is *Thuja plicata*, so it’s not a true cedar at all. And the eastern red cedar is a member of the genus *junipers*: the Latin name is *Juniperus virginiana*.
- Giving plants a genus and species name is credited to the Swedish botanist Linnaeus (1707-1778). He brought order to the confusing chaos of plant names that existed in his day by giving every plant a name that could be used internationally. To do this, he used the only language that was common to all people - Latin. Today, the binomial (two name) system set up by Linnaeus is still in use. Prior to Linnaeus, people had tried to classify plants based on the leaf shape, plant size, flower color, etc. None of these systems proved workable. Linnaeus’ revolutionary approach was to base classification on the flower and/or reproductive parts of a plant and to give plants a genus and species name. This has proven to be the best system since flowers are the plant part least influenced by the environment.
- Within a species, a subgroup may be different enough in appearance from other members of the species to be called a botanical variety. An example of this is *Juniperus communis* variety *depressa* which is the prostrate common juniper.
- The International Code of Nomenclature for cultivated plants recognizes a category called cultivar, or cultivated variety. This designates a special group of individual plants that retain their distinguished features, reproduce asexually and have a significantly different purpose in agronomy, forestry or horticulture from others in the species. When giving the name of such a plant, the cultivar name is written in common language, set off by single quotation marks, such as *Acer saccharum* ‘Green Mountain’, whose common name is ‘Green Mountain’ sugar maple.

- Geoffrey B. Charlesworth said, “If you are a beginner try not to be worried about the name problem. You will never know all the names. Nobody does. At least if there are such people they don’t have time to garden.”

PowerPoint Presentation: 10 minutes estimated

Verbal quiz: 5 minutes estimated. *(The questions here trigger further study of the handout, and verbal discussion.)*

- Consult your tree tables, and list four trees that tolerate drought.
- Name four trees that have few problems with pests?
- Which tree attains the greatest height?
- Name two trees that will tolerate full shade.
- Name the trees that are native to Minnesota.

Summary:

- While viewing the slides, hopefully you’ve recognized several trees that you frequently see in Minnesota landscapes.
- As you observe new trees in the landscape, try to research their names. One way to gain familiarity with new plants is to visit your local garden center and study the name tags. Soon you’ll widen your appreciation of our common trees, and maybe you’ll develop a curiosity for the more unusual trees that can add great interest, beauty and value to the landscape.
- From trees let’s move on to shrubs in the next lesson.

OPTIONAL ACTIVITIES

- If a public garden or arboretum is nearby, take students on a tour. Pay close attention to the name tags of the trees. To locate a garden near you, see the final point under “Websites” below. The primary arboretum in Minnesota is the Minnesota Arboretum located in Chaska, MN about 30 miles SW of the twin cities.
- Bring to class one of the books listed below; consider inter-library loan to save costs. Let the students browse the books to see the rich variety of trees available.
- If you know any nursery staff, invite them to your classroom to speak about favorite trees for your region.
- Assign the students a research project to browse trees in the various image databases listed below under “Websites”.

RESOURCES

Free:

- "A Guide for Selecting Shade and Flowering Trees for Pennsylvania Landscapes", publication CAT SC215 from Penn State University, available online at <http://pubs.cas.psu.edu/FreePubs/pdfs/sc215.pdf>.
- <http://www.greenbeltconsulting.com/ctp/treeandsoil.html> - See article "The Tree and the Soil", adaptation of a 1970 USDA publication, FS-32 "How a Tree Grows"
- Don't forget Inter-Library Loan makes any book a free (or nearly free) resource - ask your librarian for a request form (Sometimes you pay a few dollars for shipping, but usually not).

Books and CDROMs:

- *Manual of Woody Landscape Plants*, Dr. Michael A. Dirr, 1998, Stipes Publishers. Known as the "bible of the industry" for the horticultural professional. It covers hardiness, growth rate, habit, foliage, fruit, flowers, propagation, and other information.
- *Dirr's Hardy Trees and Shrubs*, Dr. Michael A. Dirr, 1997, Timber Press. Well-illustrated encyclopedia of woody plants to accompany Dirr's manual above.
- *Conifers The Illustrated Encyclopedia*, D. M. Van Gelderen and J. R. P. Van Hoey Smith, 1996, Timber Press. Thorough two-volume color encyclopedia of conifers; very little text.
- CDROMs from Horticipia, www.horticipia.com, 1-800-560-6186. Several professional level CDROM collections of plant photos, but two student editions are popular: (1) *The Professional XE Bundle* has a student version with a deep discount; it is licensed to a single PC. (2) *Horticipia A to Z* is a popular version among high schools.
- Timber Press has a wide array of quality books for horticulture. Located in Portland, Oregon, they publish books about gardening, horticulture, botany, natural history, and the Pacific Northwest. <http://www.timberpress.com/>

Websites: Within a web address, locations of specific pages may change in time; if the pages below are not found, then remove all characters that follow the website root such as ".com" or ".org" to visit the home page. Then explore the menus to find the page described below.

- <http://www.hort.uconn.edu/plants/about.html> - UConn Plant Database from the University of Connecticut.
- <http://oregonstate.edu/dept/ldplants/> - Oregon State University Department of Horticulture has an image collection called "Landscape Plants - Images, Identification, and Information" with good quality images, and many cultivars.
- <http://plants.usda.gov> - This is the Plants Database from the U. S. Department of Agriculture. It is an image database that is searchable by common name, scientific name, and growth habit.
- <http://www.oplin.org/tree/> - Visual tree identification key for Ohio, it has suitability for Minnesota.

- <http://plantfacts.osu.edu/images.lasso> - "Plant Facts" image database of plants and pests, from Ohio State University.
- <http://orb.at.ufl.edu/TREES/index.html> - "Northern Trees" is tree selection software under development as of June 2005. The project is possible through a grant from the USDA Forest Service Northeast Region in cooperation with Rutgers University and the University of Florida. Principal authors are Dr. Ed Gilman and Dr. Howard Beck, professors at the University of Florida; and Dr. Jason Grabosky at Rutgers.
- <http://www.treesaregood.com/> - The International Society of Arboriculture created this site to provide quality information on arboriculture, or tree care.
- To find a list of botanical gardens and arboreta in your vicinity, go to <http://www.aabga.org>, click on the link "Public Gardens". Near the bottom of the page you'll find the Search criteria; just use the pull-down menu to find "Minnesota", and then click the Search button.

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