

Students should be able to:

1. Understand the fundamental life processes of plants including photosynthesis and transpiration. (Biology/Life Sciences - Cell Biology 1.a,b; Earth Sciences - Energy in the Earth System 4.b)
 2. Understand the function of each part of a tree. (Biology/Life Sciences - Structure and Function in Living Systems 9.a; Earth Sciences - Biogeochemical Cycles 7.a,b,c)
 3. Understand basic ecological concepts including food webs, succession, competition, adaptation, and symbiosis. (Biology/Life Sciences - Ecology 6.a,b,c,d,e,f; Earth Sciences - Energy in the Earth System 4.a,b,c and 5.a,b; Earth Sciences: Biochemical Cycles: 7a,b)
 4. Understand how forest management can affect wildlife habitat, water quality, and soil health. (Biology/Life Sciences - Ecology 6.a,b,c,d,e,f)
 5. Understand how forest health and management affect the following issues: biological diversity, forest fragmentation, air quality, fire, and recreation. (Biology/Life Sciences - Ecology 6.a,b,c,e,f; 8.b,d)
 6. Understand how forests are managed to yield timber and what products are derived from timber. (Investigation and Experimentation - 1.l)
 7. Identify key species for the following plant communities common in California: (Biology/Life Sciences - Ecology 6.a,b,f)
 - Chaparral
 - Mixed Conifer Forest
 8. Identify with common and Latin names the following common trees without a key, and know their approximate ranges in California: (Biology/Life Sciences - Ecology 6.a,b,f)
 - Jeffery Pine
 - Ponderosa Pine
 - Coulter Pine
 - Big Cone Spruce
 - Incense Cedar
 - White Fir
 - Douglas Fir
 - Coast Redwood
 9. Identify specific species of trees and shrubs through the use of a key. (Investigation and Experimentation - 1.a)
 10. Identify, understand the life cycles, and know common control techniques for the following insect and disease pests of trees in California: (Biology/Life Sciences - Ecology 6.b,c)
 - Western Pine Beetle
 - Flat Headed Borers
 - Dwarf Mistletoe
 - Spruce Budworm
 - White Pine Blister Rust
 - Heart rot
 - Dwarf Mistletoe
 11. Understand the role of natural and human caused fires on an ecosystem. (Biology/Life Sciences - Ecology 6.a,b)
 12. Understand basic fire behavior and fire suppression tactics. (Investigation and Experimentation - 1.i)
 13. Determine both diameter and number of logs of a tree using only a Biltmore Stick. (Investigation and Experimentation - 1.a)
 14. Use the following forestry tools: clinometer, diameter tape, and prism. (Investigation and Experimentation - 1.a)
 15. Interpret all aspects of USGS quad maps; understand legal descriptions and associated terms such as section, township, and range. (Investigation and Experimentation - 1.h)
 16. Understand the cause/effect relationship factors affecting tree growth and forest development - climate, microorganisms, insects, etc. (Biology/Life Sciences - Ecology 6.b,c)
 17. Interpret volume, class, and site index tables using raw data collected through a timber cruise operation. (Investigation and Experimentation - 1.g)
 18. Know the differences, advantages, and disadvantages of even and uneven age silvicultural management practices. (Investigation and Experimentation - 1.a)
 19. Describe different types of harvest (logging) methods and understand why each is used for a specific area, species, age class, or habitat type. (Investigation and Experimentation - 1.a)

20. Know the purpose and general terms of the following laws:

- Organic Act of 1897
- Multiple Use Sustained Yield Act of June 12, 1960
- National Environmental Policy Act of 1969
- California Environmental Quality Act
- National Forest Management Act of 1976

Bibliography/Web Sites

Ecology at About.com

<http://ecology.about.com/science/ecology/>

Forestry at About.com

<http://forestry.about.com/>

Basics of Tree ID

<http://www.fw.vt.edu/dendro/forsite/Idtree.htm>

SelecTree California

<http://selectree.calpoly.edu/>

CalPhotos - Plants

<http://dlp.CS.Berkeley.EDU/photos/flora/>

Online Biology Book

<http://gened.emc.maricopa.edu/bio/bio181/>

[BIOBK/BioBookTOC.html](http://gened.emc.maricopa.edu/bio/bio181/BIOBK/BioBookTOC.html)

Tree Physiology

<http://www.dsisd.k12.mi.us/mff/Environment/>

[TreePhys.htm](http://www.dsisd.k12.mi.us/mff/Environment/TreePhys.htm)

ICE Environmental Conservation Hotlinks

http://ice.ucdavis.edu/echo/habitats_and_ecosystems.html#habitats

California Environmental Resources Evaluation System

http://ceres.ca.gov/education/students/nat_sci.html

California Native Plant Society

<http://www.cnps.org/programs/plantscience.htm>

California Natural Resource Conservation Service Homepage

<http://www.ca.nrcs.usda.gov/>

USDA Forest Service

<http://www.fs.fed.us/>

USDA Forest Service Western Forest Insects and Diseases

<http://www.fs.fed.us/r6/nr/fid/wid.htm>

Discovery.com Wildfires

<http://www.discovery.com/area/science/wildfires/>

University of California Digital Library

<http://www.cdlib.org>

Climate Information

<http://www.noaa.gov>

USGS Biological Resource Division, National

Biological Information Infrastructure

<http://biology.usgs.gov>

Sierra Nevada Science Report

<http://www.fs.fed.us/psw/publications/documents/other/sierra>

Environmental Protect Agency Water Quality Programs

<http://www.epa.gov>

US Fish and Wildlife Service

<http://www.fws.gov>

California Biodiversity Council

<http://www.ceres.ca.gov/biodiversity>

California Department of Conservation Land Use Planning Information Network

<http://ceres.ca.gov>

California Department of Fish and Game

<http://www.dfg.ca.gov/>

Manual of California Vegetation

<http://www.ice.ucdavis.edu/cnps/site.html>

Silvics of North America

http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm

Insects and Diseases of Forest Trees

<http://www.forestpests.org>

<http://www.fs.fed.us/r6/nr/fid/index/htm>

<http://www.bugwood.org/>

<http://www.forestpathology.org>

Map Information

<http://www.usgs.gov/>

<http://nationalatlas.gov/>

Federal Laws Related to the USDA Forest Service

<http://www.healthyforests.gov/>

<http://www.epa.gov/epahome/laws.htm>

California Environmental Law Information

<http://ceres.ca.gov/elaw>

USDA Forest Service History Website

<http://www.lib.duke.edu/forest/Research/usfscoll/collections/>

California Department of Forestry and Fire Protection

<http://www.fire.ca.gov>

Fire and Resource Assessment Program, California Department of Forestry and Fire Protection

<http://frap.cdf.ca.gov/>

California Association for Fire Ecology

http://www.ice.ucdavis.edu/cafe/tab_info_main.html

Forestry Connections Page of the National Association of State Foresters

<http://www.stateforesters.org/>

Fire and Aviation

<http://www.fs.fed.us/fire/>

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Society of American Foresters

<http://www.safnet.org>

Miscellaneous forestry sites:

<http://forestryindex.net/>

<http://www.worldforestry.org/>

<http://www.americanforests.org/>

<http://www.forestryimages.org/>

Urban Forestry:

<http://www.ufei.org/>