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network

# FUNDAMENTAL FORESTS

[www.earthday.net](http://www.earthday.net)

*Teachers' Guide 2002*

Dear Teacher,

One of the most exciting moments in the learning process is when we first consider something in our daily lives and begin to recognize some of the forces and processes that helped create it.

Every day in your classroom, trees are used for a variety of purposes. They compose the writing utensils and paper that students use to express their thoughts and demonstrate learned knowledge. They may provide classroom furniture, heating fuel, and the very shelter that characterizes most schools. They give shade to children on playgrounds and produce life-sustaining oxygen.



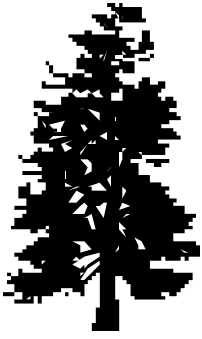
This Teachers' Guide provides tools and information to help you educate students about trees and the forests in which many trees live. Learning about trees can be a doorway for learning about water, air, soils, and a variety of ecosystems. Most important, it can help increase students' awareness of how the natural world relates to their lives and to things they use every day. We hope you will find this information of use. We would love to hear how you engage your class(es) in the subject of trees, and how you celebrate Earth Day as a class or schoolwide.

—Earth Day Network

## FOREST ECOSYSTEMS

A forest is much more than just the trees it contains.

Most of the world's trees are in forests, but forests are so much more than just trees. A forest is a whole ecosystem where communities of plants, animals, and other organisms interact. The physical environments in which they live define their interrelationships by providing particular climates, as well as by offering differing availability of water, oxygen, minerals, and other essential elements.<sup>1</sup>



# The Cycle of Life – Why Are Trees Important?

Adapted from: American Forests, *A Tree for Every Child: Learning Guide*  
[http://www.americanforests.org/resources/kids/a\\_tree\\_for\\_every\\_child](http://www.americanforests.org/resources/kids/a_tree_for_every_child)

Not only do trees provide us with wood, paper, fruit, nuts, shade, and natural beauty; they also play an important role in Earth's natural cycles.

- ◆ **OXYGEN REPLENISHMENT** — Trees are the Earth's great air conditioners. They rid the air of excess carbon dioxide and replenish oxygen. Mature trees create enough oxygen in a day to support a family of four.
- ◆ **GLOBAL WARMING PREVENTION** — Trees help lessen the impact of global warming by removing carbon dioxide from the atmosphere. They convert the carbon dioxide to carbon and oxygen, using the carbon to grow and releasing oxygen into the atmosphere. A typical healthy tree removes between 25 and 45 pounds of carbon from the air each year.
- ◆ **HABITAT FOR WILDLIFE** — Trees provide other plants and animals with food, shade, and a place to live.
- ◆ **CLEAN WATER** — Trees' hair-like root fibers help to filter groundwater, trapping nutrients and pollutants that are potential contaminants.
- ◆ **SOIL PROTECTION AND STORMWATER CONTROL** — Trees hold soil in place and remove water from the ground, helping to prevent flooding and soil erosion. Leaves and branches slow the movement of rain to the ground, allowing it to soak in more slowly. As dead trees decay, nutrients are returned to the soil.
- ◆ **ENERGY** — Trees provide shade to homes and businesses, keeping them cool and conserving energy. In some parts of the world, trees are the main source of fuel.
- ◆ **QUALITY OF LIFE** — Trees provide habitat for songbirds and beautify our communities and countryside.<sup>2</sup>
- ◆ **COMMUNITY SPIRIT** — Planting and caring for neighborhood trees can bring residents together to improve their environment and build a sense of community and environmental stewardship.

## Vanishing Forests – Where Have All the Trees Gone?

"Global paper use has grown more than six-fold since 1950. In some countries, including the United States, paper accounts for nearly 40 percent of all municipal solid waste."

—Worldwatch<sup>6</sup>

The world has lost almost half of the forests that once blanketed the Earth. Of the forests that do remain, most are no more than small or highly disturbed pieces of the fully functioning ecosystems they once were.<sup>3</sup>

Widespread clearing of forests has damaged many ecosystems so they can no longer retain water, support diverse species, control climate, conserve soil, and provide livelihood as well as they once could. This is particularly true in tropical regions. When forests are degraded, plants, animals, and humans suffer the loss of food, shelter, and energy.<sup>4</sup> Forest loss and degradation are also important direct causes of biodiversity loss, resulting in the extinction or endangering of more and more species.<sup>5</sup>



# Trees Please – Good News About Forest Preservation



Maintaining healthy forests and a wide variety of trees is essential to keeping our planet livable. The threats to the world's forests are serious. Yet important work is underway to address the problem:

- 1) **Protecting Healthy Forests** – Faced with the accelerating destruction of forests, innovative ways to meet demand for wood products while still preserving the long-term value of intact forests are being explored by governments, businesses and consumers.<sup>7</sup> People are starting to seek out products from forests that have been managed in a sustainable way, using their purchasing power to support companies that adopt better forest management practices. The Forest Stewardship Council has developed a set of principles and criteria for certifying products from well-managed forests.<sup>8</sup>
- 2) **Restoring Forests** – It is important not only to protect remaining forests, but also to carry out forest restoration projects. Worldwide, efforts are being made to regenerate degraded forests and to reestablish forests in areas from which they were removed, reestablishing native species through targeted plantings.



- 3) **Improving the Urban Environment** – Forests are not the only place where trees grow. Urban trees also play a huge role in the quality of human life, an influence that we can maximize. Through urban tree planting projects, we can bring down city temperatures and save energy by reducing the need for air conditioning. Well-positioned trees can shade buildings and reduce the energy they consume by up to 50 percent. This means reduced greenhouse gas emissions: when less coal, oil and gas are burned to power air conditioners, less heat-trapping carbon dioxide is released into the atmosphere.

## Questions for Further Inquiry<sup>9</sup>

*(For class discussion or student assignments)*



### In your elementary classroom:

- What do trees need to grow?
- Are all trees alike?
- What kinds of trees live in our schoolyard?
- Why do some trees lose their leaves and others don't?
- Why are trees important?
- What things are part of your everyday life that are made from trees?
- How can we reduce our use of tree products?

### In your secondary classroom:

- What do trees provide to humans and wildlife?
- How does the presence or absence of trees influence people? Animals?
- How do trees affect water quality?
- What happens to trees when they are harvested?
- Would you spend extra money to buy wood from a managed forest? Why or why not?
- What happens to trees when they fall over in the woods?

# Learning Activities By Subject

Adapted from: Chesapeake Bay Foundation, Bay Schools Project Sample Unit: *The Value of Trees*<sup>10</sup>

These activities will introduce your students to trees and forests. You can adapt these lessons to the Essential Academic Learning Requirements in your state. (If necessary, modify the exercises by bringing leaves, soil, small trees, or parts of trees into the classroom for study.)

## Science

- Harvest native tree seeds and grow seedlings.
- Explain how human activity such as the removal of trees accelerates natural processes.
- Carry out a scientific inquiry, analyzing and summarizing data to identify trends and form a logical argument.

## Math

- Organize and display tree loss data, using frequency tables or circle graphs.
- Measure the circumference of schoolyard trees and use charts and graphs to display data.
- Create a bar graph or histogram to display numbers and types of trees on the schoolyard.

## Social Studies

- Investigate the role of trees in Native American or other indigenous cultures.
- Research the history of forests in your region, state or local area.



- Explain the economic importance of trees.
- List examples of how trees and tree products are part of everyday life.

## Writing

- Create observational drawings of trees, incorporating captions, stories and poetry.
- Create reflective journal responses to text, investigations, and fieldwork.
- Do a research paper that addresses forests, deforestation, or a particular tree species.
- Create a page to be included in a class field guide about the trees in your schoolyard.
- Write about a particular neighborhood tree or a tree near the school. (If there are no trees near students' homes or the school, discuss and reflect on why.)

## Reading

- Read for a literary experience - analyze *The Lorax*, by Dr. Seuss; *The Giving Tree*, by Shel Silverstein; or *My Side of the Mountain*, by Jean Craighead George.
- Read to perform a task - analyze directions for planting trees, creating planting boxes, and harvesting and planting native seeds.
- Read to be informed - analyze pamphlets, brochures, and web pages when gathering information about trees and their historical importance.

## Art

- Use watercolor, pencil, and ink to create artwork for an original children's book or an exhibit at school.
- Analyze symbolism in nature photography and paintings.



# A Tree for Every American

## *Featured Community Service Learning Project*

# Tree Planting Activity

Planting a tree and caring for it as it grows is one of the most positive actions we can take toward creating a better future. Earth Day Network and American Forests are collaborating on a Trees Across America campaign to plant 285 million trees in the U.S.—"A Tree for Every American." We invite you to join this effort by planting a tree. For more information, see <http://www.earthday.net> or <http://www.americanforests.org>

**Project:** Plant trees and ensure they are watered until they are established.

**Materials:** Tree seedlings, shovel, hammer, bucket, and mulch. Small trees can be purchased at your local nursery.

**Outside Expertise:** Consider asking a local forester or tree-planting organization to assist with your tree planting.

## TREE PLANTING PROCEDURE

1. Prepare planting area by turning up soil in an area 3 to 5 times the size of the root ball.
  2. Dig a hole in the center of the area, so that the tree rests on solid soil.
  3. Backfill and use water to settle the soil.
  4. Mulch a 3-6" deep ring around the tree, being careful not to pile mulch near the trunk. (Stake only if necessary due to high winds.)
  5. Water every week, especially during the summer, and watch for signs of insects or disease. Signs of disease include yellowing leaves, foliage loss, discoloration of visible roots, and failure to grow.
- **Choose a type of tree that is suited to local conditions.** Consult a local nursery for suggestions on trees that will thrive where you live.
  - **Choose the right location.** Select a site with enough room for roots and branches to reach full size. Avoid overhead and underground utility lines. (If in doubt, contact your local utility.)
  - **Choose spots with adequate sunlight and water.**
  - **Protect newly planted trees.** A few stakes and a mesh fence can help prevent dogs and other animals from injuring your sapling.
  - **Plan for the tree's care.** Water a new tree weekly for the first 6 months and look after it for at least 3-5 years. Plan who will look after the tree in the summer and in future years.



***When you plant and care for trees, you are making the future better for your family, your neighborhood, your countryside, and our world.<sup>11</sup>***

# Resources For More Information

**Earth Day Network and American Forests** are joining forces to plant 285 million trees over the next five years. The campaign is called *Trees Across America*. We invite you to participate by planting one or more trees, or by contributing to this joint effort. For more information, see <http://www.earthday.net> or <http://www.americanforests.org>

**American Forests A Tree For Every Child:** Plant more than ideas for your classrooms and for Earth Day. "A Tree for Every Child" is a hands-on and flexible environmental education program that helps students take practical action to create a better world. Involve one class, a whole grade level, or the entire school. **Contact:** American Forests, P.O. Box 2000, Washington, DC 20012, tel: (800) 873-5323 <http://www.americanforests.org> and [http://www.americanforests.org/resources/kids/a\\_tree\\_for\\_every\\_child](http://www.americanforests.org/resources/kids/a_tree_for_every_child)

**Chesapeake Bay Foundation** offers a regional field-based environmental education program, partnering with regional schools to integrate the study of the Chesapeake Bay into the curriculum. Their Student BaySavers program engages middle and high school students in habitat restoration projects and field trips. **Contact:** CBF, Philip Merrill Environmental Center, 6 Herndon Avenue, Annapolis, MD 21403, tel: (410) 268-8816, email: [chesapeake@cbf.org](mailto:chesapeake@cbf.org) <http://www.cbf.org>

**Forests.org:** The Forest Conservation Portal offers web-based scientific & advocacy links by topic: Forest Types (Rainforests, Temperate, Boreal Forests...), Forest Destruction (Logging, Agriculture, Oil/Gas, Pulp, Mining...), Forest Protection Campaigns, Forest Ecology and What You Can Do. <http://forests.org>



## Sources

- 1 American Forests, "A Tree for Every Child: Learning Guide"
- 2 <http://www.arboday.org/trees/buytrees.html>
- 3 IUCN: World Conservation Union, 2000 <[http://www.iucn.org/info\\_and\\_news/press/forest2000.html](http://www.iucn.org/info_and_news/press/forest2000.html)>
- 4 World Resources 2000-2001, <<http://www.wri.org/wr2000/forests.html>>
- 5 Biodiversity Action Network
- 6 Worldwatch Paper No. 149, *Paper Cuts: Recovering the Paper Landscape*, Janet N. Abramovitz and Ashley T. Mattoon, September 1999
- 7 Worldwatch Press Release on Forests, Saturday, April 4, 1998, <<http://www.worldwatch.org/alerts/pr980402.html>>
- 8 Forest Stewardship Council, <<http://www.fscoax.org/principal.htm>>
- 9 Most of these questions are adapted from *Bay Schools Project Sample Unit*, "The Value of Trees," Chesapeake Bay Foundation.
- 10 *Bay Schools Project Sample Unit*, "The Value of Trees," Chesapeake Bay Foundation
- 11 <<http://www.arboday.org/trees/buytrees.html>>

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**RainforestWeb.org** is a global Internet portal for information about rainforests. It addresses questions such as "Why are rainforests important? What's happening in the rainforests? Why are rainforests being destroyed? How are rainforests protected? How can you help?" <http://www.rainforestweb.org>

**Rainforest Action Network** has an interactive site with lots of info and links for helping rainforests. **Contact:** RAN, 221 Pine Street, Suite 500, San Francisco, CA 94104, tel: (415) 398-4404, fax: (415) 398-2732, email: [rainforest@ran.org](mailto:rainforest@ran.org) <http://www.ran.org>

**Rainforest Alliance** has a Kids and Teachers resources page with lots of teacher resources such as Classroom Activities, Classroom Activities for Younger Students, Tropical Forest Facts, Rainforest Stories, and a Tropical Coloring Book. <http://www.rainforestalliance.org/kids&teachers/index.html>

**Trees for the Future** is working with people from developing countries to replant rainforests. These tree planting projects restore degraded soil, provide firewood for cooking and warmth, control erosion, help to maintain the water table, and increase crop yields. **Contact:** Trees for the Future, P.O. Box 7027, Silver Spring, MD 20907, tel: (800) 643-0001, email: [info@treesftf.org](mailto:info@treesftf.org) <http://www.treesftf.org>

**U.S. Forest Service, U.S. Department of Agriculture:** Their Conservation Education program offers *Ecosystem Matters: An Activity and Resource Guide for Environmental Educators*, with learning activities tailored for grades K-3, 4-5, 6-8, and 9-12. <http://www.na.fs.fed.us/spfo/pubs/misc/eco/index.html>

**World Resources Institute: Pilot Analysis of Global Ecosystems (PAGE)** – Forest Ecosystems, December 2000, is a report with lots of overview information and data available on-line. **Contact:** World Resources Institute, 10 G Street, NE, Suite 800, Washington, DC 20002, tel: (202) 729-7600, fax: (202) 729-7610 [http://www.wri.org/wr2000/forests\\_page.html](http://www.wri.org/wr2000/forests_page.html)

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[earthday@earthday.net](mailto:earthday@earthday.net) ♦ [www.earthday.net](http://www.earthday.net)

811 First Avenue, Suite 454, Seattle, WA 98104, USA, Tel: (206) 876-2000, Fax: (206) 876-2015  
1616 P Street, NW, Suite 200, Washington, DC 20036, USA, Tel: (202) 518-8794, Fax: (202) 518-0044