PROJECT
PLANT IT!®

Trees for kids and their communities

Teacher's Guide for the Classroom

Includes state learning standards correlations

Dominion®

Table of Contents

Project Plant It! Timeline

January	• **Project Plant It!** teacher kits arrive at school
January – April	• Enjoy **Project Plant It!** lesson plans and activities
Week of Arbor Day	• **Project Plant It!** seedlings arrive at schools for use with lesson plans • Send home with students **Project Plant It!** seedlings with copy of certificate and official parent/guardian letter
Arbor Day	• Celebrate the occasion with a tree-planting day at school
Following Arbor Day	• Find additional **Project Plant It!** activities on the **Project Plant It!** Web site • Students continue to care for trees and watch them grow!

Best Practices for Project Plant It!

Dominion has developed the following Best Practices to help teachers maximize their planning and instructional time that will be allocated for the **Project Plant It!** program:

• The best time to teach **Project Plant It!** is from mid-March through Arbor Day, which falls on the last Friday of April. Your Teacher's Guide contains 11 lesson plans, along with some additional classroom activities.

• If your teaching schedule only allows 1–2 weeks for **Project Plant It!**, we recommend that you focus on the timeframe from mid-to-late April and that you make these FOUR lesson plans a priority:
   1. Identify the Parts of a Tree
   2. Identify the Parts of a Leaf
   3. Planting a Tree!
   4. Watch It Grow!

• Encourage students to visit the website, **www.ProjectPlantIt.com**, several times at home and in the classroom. All of the interactive games and videos are educational and align with state learning standards. Students will have fun and learn at the same time!

• Ask the school librarian to display books about trees during the month of April. A **Tree Reading List** is included in your Teacher's Guide.

• Recognize Arbor Day by planting a tree outdoors on school grounds with your students. This offers a visual and hands-on outdoor experience that will create a lifelong memory about **Project Plant It!**

• Be sure to "Like" **Project Plant It!** on Facebook. Dominion will post photos of students planting trees and enjoying outdoor activities with **Project Plant It!** Also, you'll see stories about **Project Plant It!** in the media.

If you have any suggestions to share with Dominion, please submit them on the "Contact Us" tab on the homepage of **www.ProjectPlantIt.com**.

The Roots of Arbor Day

More than one hundred years ago, a young man named J. Sterling Morton followed the movement of pioneers westward. He and his wife, Caroline, settled in Nebraska City, Nebraska, an area of the country that had very few trees. The Mortons loved trees. They planted many trees on the grounds of their home and encouraged everyone they knew to do the same.

As a journalist and editor of Nebraska's first newspaper, J. Sterling Morton spread his message about the importance of tree planting. Morton encouraged settlers to plant trees for wood to build and heat their homes. He also wrote about the benefits of planting trees for food, shade, beauty and protection from the wind.

In 1872, at a meeting of the State Board of Agriculture, J. Sterling Morton first proposed a tree planting holiday to be called "Arbor Day." The support for this new holiday was so great that more than one million trees were planted in Nebraska on the first Arbor Day. Soon, other states passed legislation to observe Arbor Day and, today, Arbor Day is celebrated in every state in the nation and in many other countries around the world.

For more than 100 years, school children have joined in Arbor Day celebrations by planting and caring for trees that beautify and benefit their communities. J. Sterling Morton was proud of the success of Arbor Day and noted, "Other holidays repose upon the past; Arbor Day proposes for the future."

Today, Arbor Day celebrations are held in communities all over America, with the date determined by the best tree planting time in each area. National Arbor Day is celebrated the last Friday in April.

— Information provided by The Arbor Day Foundation

Arbor Day Celebration

Plant a class tree on Arbor Day. This will be a time when all participating classrooms can gather to plant **Project Plant It!** seedlings on school grounds or another suitable location. Invite the students' parents, and even the entire school, to attend the ceremony.

The Arbor Day Foundation makes these suggestions for a fun and meaningful Arbor Day tree-planting ceremony at your school:

• Present the U.S. flag. Good choices for presenters include scouts or representatives from veterans groups.

• Arrange for welcoming comments by your principal or a community leader.

• Plant a **Project Plant It!** seedling together. Follow correct planting procedures. Take photographs of the event and display them later in a prominent place.

• Read a brief Arbor Day history stressing that planting trees and wise environmental stewardship are the purposes of this commemorative day.

• Sing songs, read poems or a story about trees, tree planting or the importance of trees. You'll find some examples in the **More Tree Fun** section, beginning on page 49.

• Announce and/or recognize individual and group commitments to future stewardship projects.

• Retire the flag. Sing a closing song.

Access www.ProjectPlantIt.com

When you go to the **Project Plant It!** Web site, you will find lots of great information to use for this exciting educational program. On the Web site, you can:

• View videos about trees for classroom instruction.

• Find additional lesson plans as well as classroom activities.

• Direct your students and their parents to planting and care instructions and important safety tips.

• Access an electronic format of the Teacher's Guide to download lesson plans and activities.

You can also use **ProjectPlantIt.com** to make any comments about the program or to find any additional information you may need.

Important Tree Safety Tips

• Do not plant trees underneath or within 25 feet of an overhead power line.

• Do not plant trees on top of underground power, cable, phone or gas lines.

• To ensure your safety, always call 811 **before** you dig into the ground.

• Remember: never climb a tree that is near power lines.

Lesson Plans

Educational Standards by State

Please utilize this listing to see the content area and learning standards each **Project Plant It!** lesson supports.

Lesson 1: Know Your Tree Terminology
Virginia Standards of Learning Grade 3
    Science: 3.6
    Language Arts: 3.4, 3.7, 3.12
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-1
    Language Arts: R-3-1, R-3-2, R-3-3, W-3-2
Connecticut Common Core Standards Grade 3
    Science: 3.2
    Language Arts: RL.3.4, RI.3.5, RF.3.4, W.3.4, SL.3.1,
        L.3.4
North Carolina Competency Goals Grade 3
    Science: 3.L.2
    Language Arts: RL.4, RI.4, W.4, SL.1, SL.2, L.4
Maryland State Curriculum Grade 3
    Science: 1.A.1
    Language Arts: 1.B.2, 1.C.2, 1.D.2
New York State Standards Grade 3
    Living Environment: 1.1, 1.2, 2.1, 2.2, 3.1, 4.1, 5.1, 6.1
    Language Arts: RL.4, RI.4, W.2, W.9, SL.1, L.1, L.3, L.4
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A1, 3.1.3.A2, 3.1.3.A3,
        3.1.3.A5, 3.1.3.C1
    Language Arts: 1.1.3.B, 1.1.3.C, 1.1.3.D

Lesson 2: Identify the Parts of a Tree
Virginia Standards of Learning Grade 3
    Science: 3.6, 3.8
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-1, LS1(3-4)-1, LS1(3-4)-3,
        LS1(3-4)4, LS2(3-4)-5, LS2(3-4)-6
Connecticut Common Core Standards Grade 3
    Science: 3.2
North Carolina Competency Goals Grade 3
    Science: 3.L.2
Maryland State Curriculum Grade 3
    Science: 2.O.C., 3.O.E
New York State Standards Grade 3
    Living Environment: 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 5.1,
        5.2, 6.1, 6.2
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A1, 3.1.3.A2, 3.1.3.A3,
        3.1.3.A5, 3.1.3.C1

Lesson 3: Tree-Tac-Toe
Virginia Standards of Learning Grade 3
    Science: 3.4, 3.5, 3.6, 3.10
    Language Arts: 3.2, 3.4, 3.6, 3.9
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-2, LS1(3-4)-4, LS2(3-4)-6,
        LS3(3-4)-7
    Language Arts: W-3-1, W-3-2, R-3-7

Connecticut Common Core Standards Grade 3
    Science: 3.2
    Language Arts: RL.3.1, RI.3.1, W.3.2, SL.3.1
North Carolina Competency Goals Grade 3
    Science: 3.L.2
    Language Arts: RL.1, RI.1, W.2, SL.1
Maryland State Curriculum Grade 3
    Science: 1.A.1
    Language Arts: 2.A.1, 2.A.2, 4.A.7
New York State Standards Grade 3
    Living Environment: 1.1, 1.2, 2.1, 3.1, 3.2, 4.1, 4.2, 5.1,
        5.2, 6.1
    Language Arts: R.1, RI.1, W.2, SL.1
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A2, 3.1.3.C1
    Language Arts: 1.1.3.D, 1.2.3.B, 1.2.3.D, 1.2.3.E,
        1.5.3.F, 1.8.3.B

Lesson 4: Identify the Parts of a Leaf
Virginia Standards of Learning Grade 3
    Science: 3.6, 3.8
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-1, L LS1(3-4)-3, LS1(3-4)4,
        LS2(3-4)-5, LS2(3-4)-6
Connecticut Common Core Standards Grade 3
    Science: 3.2
North Carolina Competency Goals Grade 3
    Science: 3.L.2
Maryland State Curriculum Grade 3
    Science: 3.O.E, 4.O.A
New York State Standards Grade 3
    Living Environment: 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1, 5.1,
        5.2, 6.1, 6.2
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A1, 3.1.3.A2, 3.1.3.A3,
        3.1.3.A5, 3.1.3.C1

Lesson 5: Trees In Our World
Virginia Standards of Learning Grade 3
    Geography: 3.5
    Science: 3.6
    Language Arts: 3.7, 3.11, 3.12
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-1, LS1(3-4)-4, LS2(3-4)-6,
        LS3(3-4)-7
    Language Arts: W-3-2, W-3-3, R-3-7, R-3-8
Connecticut Common Core Standards Grade 3
    Social Studies: 1.4, 1.5, 2.1, 2.3, 2.4
    Science: 3.2
    Language Arts: RI.3.1, RI.3.2, W.3.7, W.3.8
North Carolina Competency Goals Grade 3
    Social Studies: 3.G.1.2, 3.G.1.6
    Science: 3.L.2.1, 3.L.2.2
    Language Arts: R.1, RI.5, RI.10, SL.1, SL.2, SL.3
Maryland State Curriculum Grade 3
    Social Studies: 3.B.1, 6.C.1
    Science: 2.C.1
    Language Arts: 1.E.3, 2.A.1, 2.A.2, 4.A.3

New York State Standards Grade 3
    Social Studies: 3.2
    Living Environment: 4.1, 4.3, 5.1, 5.2, 6.1
    Language Arts: RI.5, W.2, W.8, SL.1, SL.4
Pennsylvania Common Core Standards Grade 3
    Geography: 7.1.3.B
    Environment & Ecology: 4.1.3.D, 4.4.3.C
    Science & Technology: 3.1.3.A1, 3.1.3.C1
    Language Arts: 1.1.3.D, 1.2.3.D, 1.8.3.B, 1.8.3.C

Lesson 6: Math and Fractions in the Forest
Virginia Standards of Learning Grade 3
    Math: 3.2, 3.3, 3.6
Rhode Island Grade Level Expectations Grade 3
    Math: M(N&O)3-4, M(D)3-1, M(CCR)5-1, M(CCR)5-2
Connecticut Common Core Standards Grade 3
    Math: 3.OA.3, 3.NF.1, 3.NF.3, 3.MD.3
North Carolina Competency Goals Grade 3
    Math: 1.02, 1.03, 1.04, 1.05, 4.01
Maryland State Curriculum Grade 3
    Math: 6.A.2.a, 6.A.2.b, 6.C.1.f, 6.C.1.g
New York State Standards Grade 3
    Math: 3.PS.6, 3.PS.11, 3.N.10, 3.N.11, 3.N.13,
        3.N.19, 3.N.20
Pennsylvania Common Core Standards Grade 3
    Math: 2.1.3.C, 2.1.3.E, 2.5.3.A, 2.6.3.B

Lesson 7: Tree Product Scavenger Hunt
Virginia Standards of Learning Grade 3
    Science: 3.1, 3.3
    Language Arts: 3.10
Rhode Island Grade Level Expectations Grade 3
    Earth Science: ESS1(3-4)-6
    Language Arts: W-3-5.5, W-3.9.5, OC-3-1.4
Connecticut Common Core Standards Grade 3
    Science: 3.1, 3.4
    Language Arts: W.4, SL.3, SL.4
North Carolina Competency Goals Grade 3
    Science: 3.P.2.2
    Language Arts: W.4
Maryland State Curriculum Grade 3
    Science: 3.E.1
    Language Arts: 4.A.4
New York State Standards Grade 3
    Physical Setting: 3.1
    Living Environment: 6.1
    Language Arts: W.4, W.8
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A5, 3.4.3.B3
    Environment & Ecology: 4.3.3.A
    Language Arts: 1.5.3.B, 1.6.3.A

Lesson 8: Tree Book Report
Virginia Standards of Learning Grade 3
    Language Arts: 3.1, 3.2, 3.4, 3.5, 3.6, 3.9, 3.10, 3.11
Rhode Island Grade Level Expectations Grade 3
    Language Arts: R-3-1, R-3-4, R-3-5, R-3-7, R-3-11, R-3-14,
        R-3-15, W-3-1, W-3-2, W-3-3, W-3-4, W-3-8, OC-3-1

Connecticut Common Core Standards Grade 3
    Language Arts: RL.3.3, RL.3.5, RL.3.7, RL.3.9, W.3.2,
        W.3.3, W.3.7, SL.3.1, SL.3.4, L.3.3, L.3.4
North Carolina Competency Goals Grade 3
    Language Arts: R.2, R.3, R.5, W.3, W.7, SL.1, SL.2, L.1,
        L.2, L.3
Maryland State Curriculum Grade 3
    Language Arts: 1.E.1, 1.E.3, 1.E.4, 3.A.1, 3.A.3, 3.A.6,
        3.A.7, 4.A.2, 4.A.3, 4.A.6, 5.A.2, 6.A.2
New York State Standards Grade 3
    Language Arts: RL.2, RL.3, RL.5, RL.11, W.2, W.4, W.7,
        W.9, SL.1, SL.2, SL.4
Pennsylvania Common Core Standards Grade 3
    Language Arts: 1.1.3.A, 1.2.3.A, 1.2.3.E, 1.3.3.C,
        1.4.3.B, 1.5.3.A, 1.5.3.B, 1.5.3.D, 1.6.3.A

Lesson 9: Understanding Energy
Virginia Standards of Learning Grade 3
    Science: 3.10, 3.11
    Language Arts: 3.1, 3.2, 3.4, 3.9, 3.11
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS2(3-4)-5
    Physical Science: PS2(3-4)-5, PS2(3-4)-6
    Language Arts: W-3-1, W-3-3, R-3-2, R-3-7
Connecticut Common Core Standards Grade 3
    Science: 3.4
    Language Arts: RI.3.4, RI.3.10, W.3.2, W.3.7
North Carolina Competency Goals Grade 3
    Science: 3.P.2
    Language Arts: RI.1, RI.7, RI.10, W.2, W.7
Maryland State Curriculum Grade 3
    Science: 1.C.1, 5.B.1
    Language Arts: 2.A.1, 2.A.2, 4.A.2, 4.A.3
New York State Standards Grade 3
    Physical Setting: 4.1, 4.2
    Living Environment: 6.2
    Language Arts: RI.7, RI.10, W.2, W.7
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.2.3.B2, 3.2.3.B4, 3.2.3.B6,
        3.4.3.E3
    Environment & Ecology: 4.1.3.C
    Language Arts: 1.1.3.D, 1.2.3.D., 1.5.3.B, 1.5.3.F,
        1.6.3.A, 1.8.3.B, 1.8.3.C

Lesson 10: Planting a Tree!
Virginia Standards of Learning Grade 3
    Science: 3.1, 3.6, 3.7, 3.9, 3.10
    Math: 3.9, 3.17
    Language Arts: 3.9, 3.11
Rhode Island Grade Level Expectations Grade 3
    Life Science: LS1(3-4)-2, LS1(3-4)-4, LS2(3-4)-6,
        LS2(3-4)-7
    Earth Science: ESS1(3-4)-1
    Math: M(N&O)-3-7
    Language Arts: W-3-1.1, W-3-2.1
Connecticut Common Core Standards Grade 3
    Science: 3.2
    Math: 3.OA.5, 3.OA.7

Language Arts: W.3.2
North Carolina Competency Goals Grade 3
    Science: 3.L.2
    Math: 1.02, 1.03, 1.04, 1.06
    Language Arts: W.2
Maryland State Curriculum Grade 3
    Science: 1.A.1
    Math: 3.A.1, 3.B.1, 3.C.1, 6.C.1
New York State Standards Grade 3
    Physical Setting: 2.1
    Living Environment: 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 4.1,
        4.2, 5.1, 6.1, 6.2
    Math: E.N.19, E.N.20, 3.CM.9, 3.R.8, 3.M.2
    Language Arts: W.2
Pennsylvania Common Core Standards Grade 3
    Science & Technology: 3.1.3.A, 3.1.3.C
    Environment & Ecology: 4.1.3, 4.4.3
    Math: 2.1.3, 2.3.3
    Language Arts: 1.4.3.B

Lesson 11: Watch It Grow!
Virginia Standards of Learning Grade 3
    Math: 3.9
    Science: 3.1, 3.6, 3.9
Rhode Island Grade Level Expectations Grade 3
    Math: M(N&O)-3-7, M(DSP)-3-1, M(CCR)-2-1
    Life Science: LS1(3-4)-1, LS1(3-4)-2, LS1(3-4)-3,
        LS2(3-4)-5
Connecticut Common Core Standards Grade 3
    Math: 3.OA.3, 3.MD.3, 3.MD.4
    Science: 3.2
North Carolina Competency Goals Grade 3
    Math: 1.03, 1.04, 3.02, 4.01
    Science: 3.L.2
Maryland State Curriculum Grade 3
    Math: 3.B.1, 3.C.2, 7.A.1, 7.C.1
    Science: 1.A.1, 1.D.3
New York State Standards Grade 3
    Math: 3.PS.7, 3.CM.5, 3.R.1, 3.N.24, 3.M.2, 3.S.2,
        3.S.4, 3.S.5, 3.S.8
    Physical Setting: 3.1
    Living Environment: 1.1, 1.2, 3.1, 3.2, 4.1, 4.2, 5.1,
        5.2, 6.1, 6.2
Pennsylvania Common Core Standards Grade 3
    Math: 2.3.3.B, 2.3.3.F, 2.6.3.A, 2.6.3.B, 2.6.3.D,
        2.8.3.F
    Environment & Ecology: 4.5.3.D, 4.4.3.C
    Science & Technology: 3.1.3.A2, 3.1.3.A5, 3.1.3.C1,
        3.2.3.B6

Lesson 1: Know Your Tree Terminology

Objective:
Students will become familiar with tree vocabulary through two fun activities.

Materials Needed:
Copies of Tree Terminology Worksheet, Tree Word Search Worksheet and Tree Crossword Puzzle Worksheet.

Time:
Probably two sessions of 40 min. each

Intro:
This is recommended as the first lesson plan for the **Project Plant It!** program. It will give students a working knowledge of tree terminology for the duration of the program.

Procedure:
Teacher passes out Tree Terminology, along with Tree Word Search and Tree Crossword Puzzle. Students may use the Tree Terminology sheet to help complete both worksheets.

Results:
Students will be very adept at using tree vocabulary for all of their **Project Plant It!** activities.

Answer Key for Crossword Puzzle on page 13.

PROJECT PLANT IT!
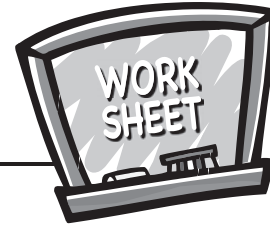
Tree Terminology

Tree experts use a special language that includes many of the words and definitions listed below. Add these words to your vocabulary and you will sound like a tree expert, too!

Acorn - The "fruit" of oak trees

Annual rings - Circles in the middle of a tree trunk that indicate a tree's age; one circle for each year

Arbor Day - A special day in the United States in mid-to-late April that encourages the planting and care of trees; established in 1872 by J. Sterling Morton in Nebraska

Bark - The outside "skin" of the woody parts of a tree

Branch - The part of a tree that grows outward from the trunk

Bud - The place on the twig or stem where flowers or leaves will come from

Carbon Dioxide - The gas that is released by humans and other animals when they breathe; plants need it to live

Cone - Woody growth that contains seeds, like a pinecone

Conifer - Trees that grow cones with seeds, such as pines and spruce

Deciduous - The name for trees that lose their leaves in the fall

Evergreen - Trees that keep their leaves all year long

Flower - The part of a plant that produces fruit

Forest - A large area covered with trees

Fruit - A seed container that develops from a flower; some examples are acorns, apples, berries and pods

Habit - The shape of a tree

Habitat - The natural environment where a tree lives

Leaf - The green part of a tree where food is created for the tree and oxygen is produced

Lobe - The part of a leaf that "sticks out" like a bump; examples of trees with lobed leaves are maple, oak and sycamore

Needle - A long, narrow leaf, sometimes pointed, like those on a pine tree

Nursery - A place where young trees are raised

Oxygen - The gas that is produced by plants; humans and animals need it to live

Photosynthesis - The process during which plants combine water, carbon dioxide and sunlight to make chlorophyll and oxygen

Rainforest - A wooded area in a hot climate with very high annual rainfall of at least 100 inches

Root - The underground part of a tree that holds it in the soil; roots also take in water and nutrients to help make food for the tree

Sap - The fluid inside of a plant that distributes food and water to various parts of the plant

Sapling - A young tree less than 3-feet tall

Seed - The part of a tree that will produce new trees when planted

Seedling - A very young tree

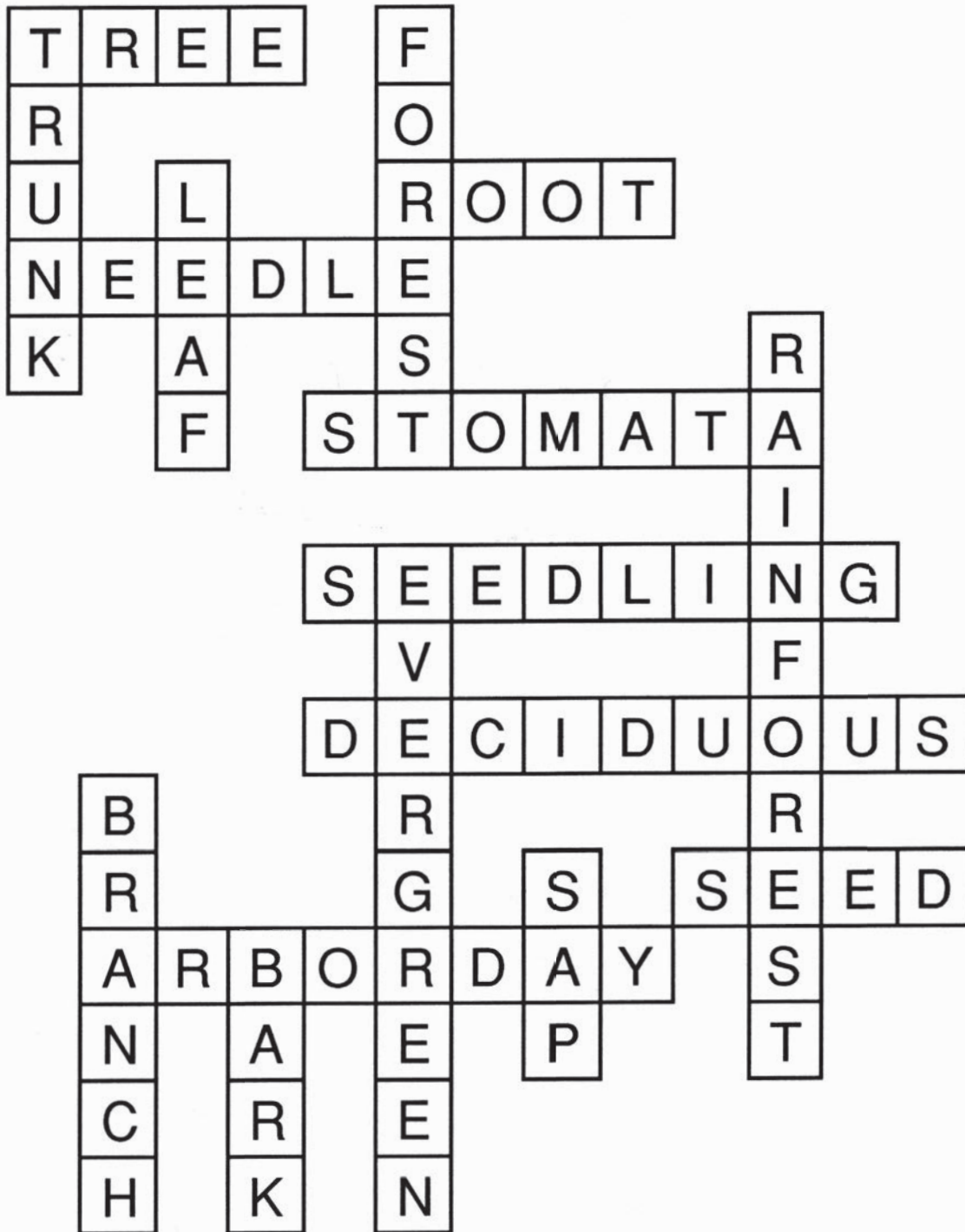**Species** - A single type of tree, like the dogwood or maple tree

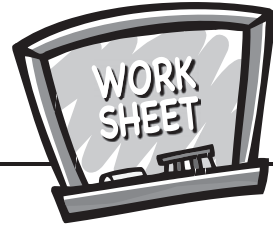**Stomata** - Tiny holes on a leaf where carbon dioxide goes in and oxygen comes out

Tree - A large woody plant, usually with one main trunk, growing over 15 feet high
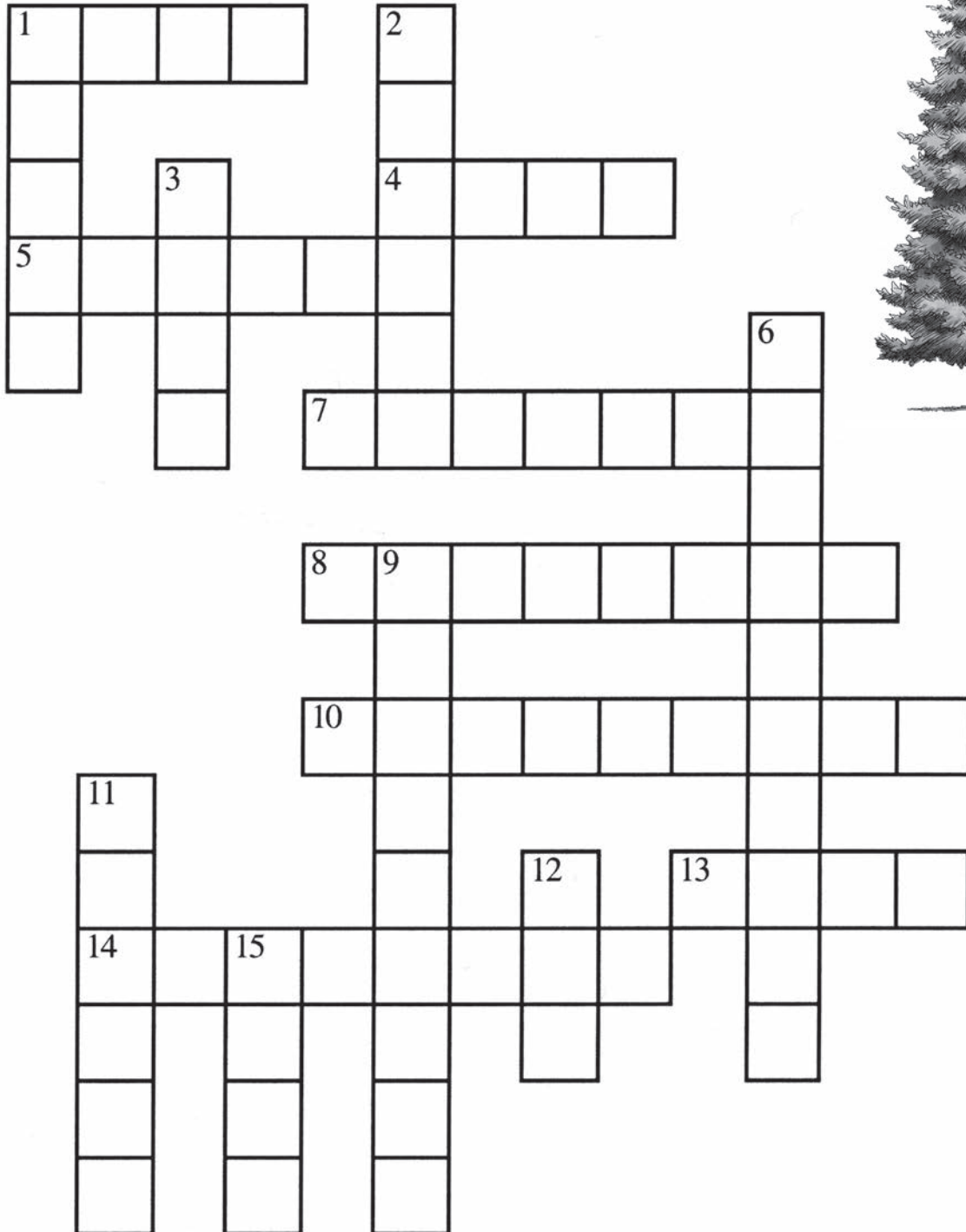
Trunk - The main stem of a tree
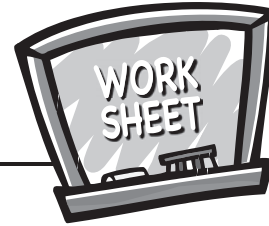
Twig - A small tree branch

Tree Crossword Puzzle (answer key)

```
T R E E        F
R              O
U      L       R O O T
N E E D L E    E              R
K      A       S              A
       F     S T O M A T A    I
                              N
             S E E D L I N G  G
             V                F
             D E C I D U O U S
   B         R                R
   R         G       S    S E E D
   A R B O R R D A Y         S
   N         E       P       T
   C         E
   H    K    N
```

Tree Crossword Puzzle

Tree Crossword Puzzle

ACROSS

1 A large woody plant, usually with one main trunk, growing over 15 feet high

4 The underground part of a tree that holds it in the soil

5 A long, narrow leaf, sometimes pointed, like those on a pine tree

7 Tiny holes on a leaf where carbon dioxide goes in and oxygen comes out

8 A very young tree

10 The name for trees that lose their leaves in the fall

13 The part of a tree that will produce new trees when planted

14 A special day in the United States in mid-to-late April that encourages the planting and care of trees; established in 1872 by J. Sterling Morton in Nebraska

DOWN

1 The main stem of a tree

2 A large area covered with trees

3 The green part of a tree where food is created for the tree and oxygen is produced

6 A wooded area in a hot climate with very high annual rainfall of at least 100 inches

9 Trees that keep their leaves all year long

11 The part of a tree that grows outward from the trunk

12 The fluid inside of a plant that distributes food and water to various parts of the plant

15 The outside "skin" of the woody parts of a tree
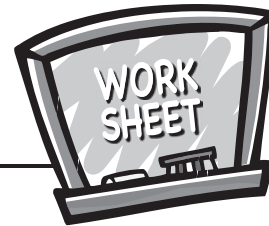
Tree Word Search

C	O	N	I	F	E	R	K	R	A	B
R	Y	E	M	E	N	O	C	B	S	R
O	G	E	U	J	W	O	L	U	A	A
W	T	D	I	N	T	T	O	D	P	N
N	A	L	B	F	R	U	I	T	X	C
U	R	E	M	S	D	N	W	T	T	H
Y	B	F	A	I	I	I	O	H	R	D
P	O	A	C	E	G	O	D	T	E	M
O	R	E	V	E	R	G	R	E	E	N
N	D	L	F	P	C	U	S	L	U	B
A	A	O	A	Z	N	R	Y	Q	S	V
C	Y	T	J	K	O	X	Y	G	E	N

Arbor Day

Bark

Branch

Bud

Canopy

Cone

Conifer

Deciduous

Evergreen

Fruit

Leaf

Needle

Oxygen

Root

Sap

Seed

Tree

Trunk

Twig

Lesson 2: Identify the Parts of a Tree

Objective:
Students will be able to identify exterior/interior parts of a tree, to name the main parts of a tree's life cycle and to estimate the age of a tree.

Materials Needed:
Project Plant It! tree seedlings (when they arrive), **Project Plant It!** poster, seed container such as pinecone/acorn/pod. Parts of a Tree Worksheets #1 and #2, pieces of cut firewood showing annual rings (recommended but not mandatory), copies of Tree Terminology sheet, pencil.

Time:
Probably two sessions of 40 min. each

Intro:
Using the **Project Plant It!** tree seedlings, **Project Plant It!** poster, pieces of firewood and seed containers as interactive teaching tools, students will get an up-close look at the parts of a tree and understand a tree's life cycle. Students will use worksheets to reinforce their knowledge of the parts of a tree.

Procedure:
• Teacher divides students into groups—

Group #1 looks up information on the **Project Plant It!** tree seedling species. An excellent resource is www.arborday.org/treeguide. Enter the name of your tree species in the search box to get started. Ask students to share facts about this tree with classmates such as: best climate conditions for this tree, average height, type of soil it needs, type of climate it needs, how much moisture it needs, details about the needles.

Group #2 gathers around one of the **Project Plant It!** posters to look at the illustrations of the exterior and interior parts of a tree. Teacher explains the different parts and how they work together to support, feed and protect the tree. If teacher has brought in pieces of firewood, show students a real-life cross-section of the trunk so they can see the rings and the inner/outer bark. Teacher explains that the sap travels from the sapwood through the other layers to help feed the tree. Ask students if they can guess the age of the tree based on the rings they can see.

• Students switch groups as time allows.

• After group activity, teacher shows students the exterior parts of a tree on the **Project Plant It!** poster. Teacher passes out **Project Plant It!** tree seedlings (if they have arrived) to students. Ask students if they can see some of the exterior parts evident in their tree.

• Teacher shows students the seed container and says that all trees start as a tiny seed. Trees go from seed to seedling to sapling to tree. What stage is their tree in?

• Teacher passes out Parts of a Tree Worksheets #1 and #2 and Tree Terminology Worksheet. Students follow instructions on the Worksheets. Go over correct answers so that students can make adjustments as needed. Put Parts of a Tree Worksheets #1 and #2 with the student's **Project Plant It!** materials.
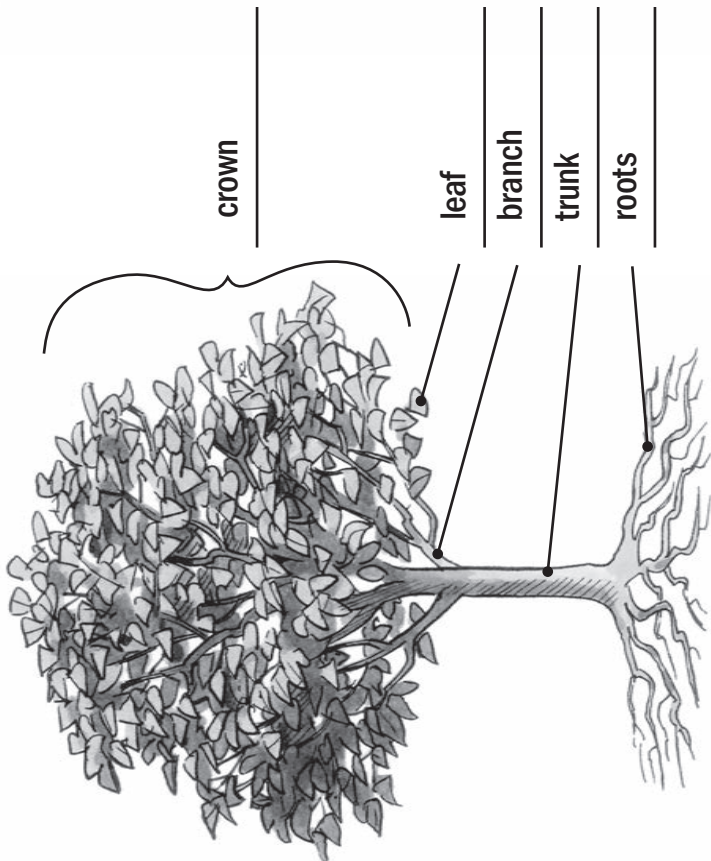
Result:
Students will be expected to use the proper terminology when talking about the parts of a tree or its life cycle, and understand these terms when they are working on **Project Plant It!** activities.

Parts of a Tree Worksheet #1 (answer key)

needle

branch
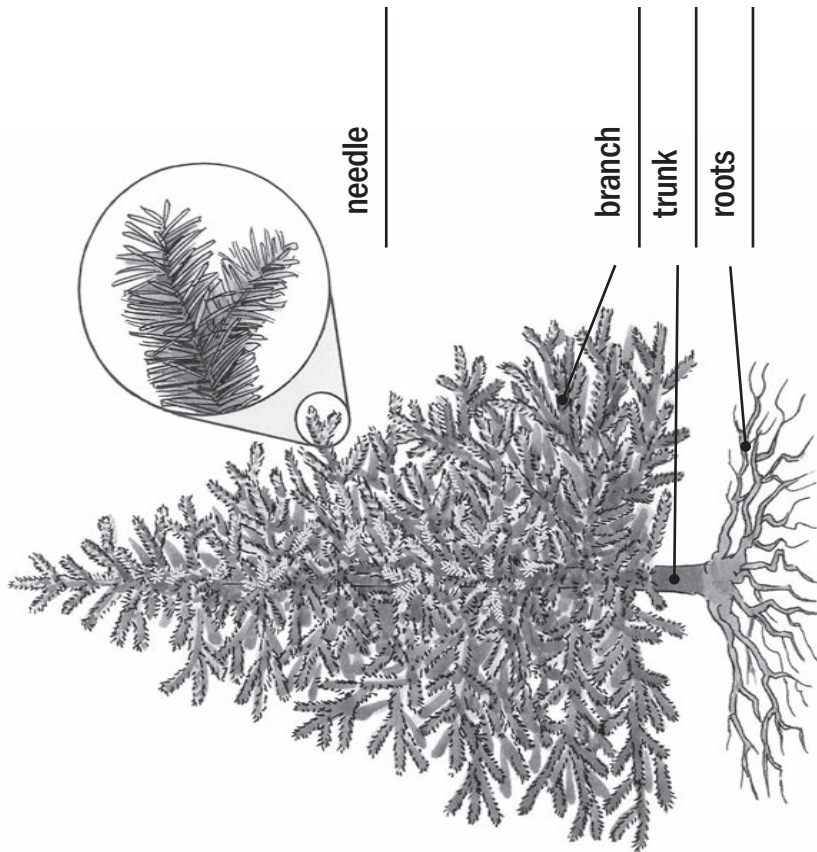
trunk

roots

crown

leaf
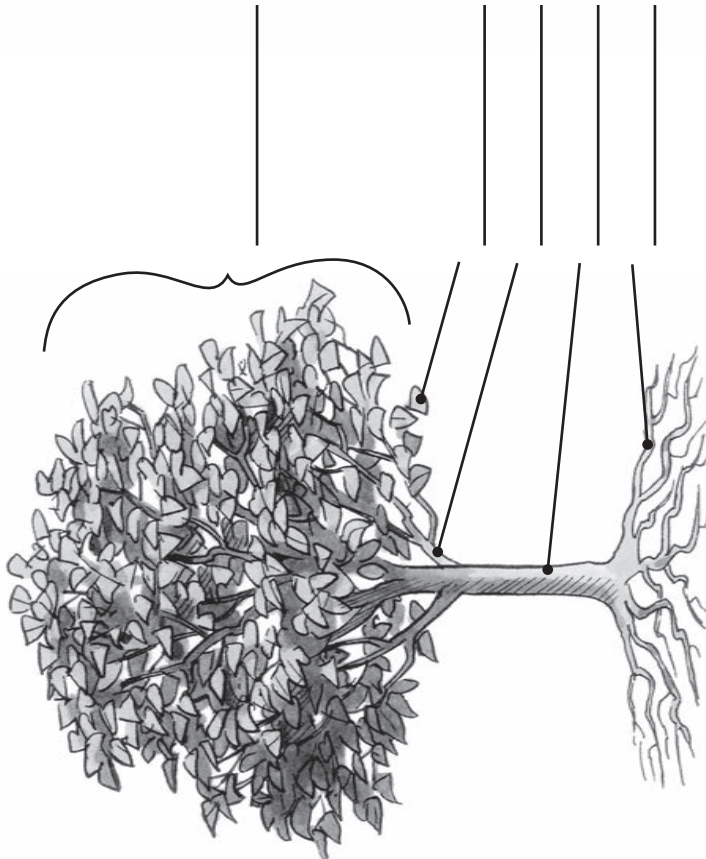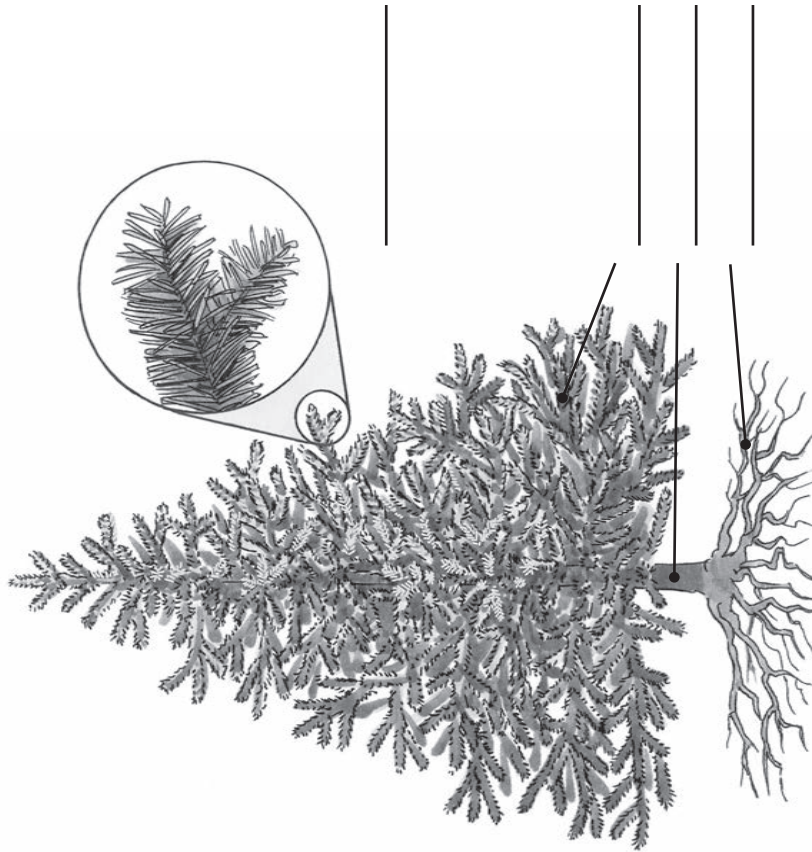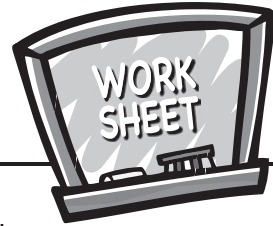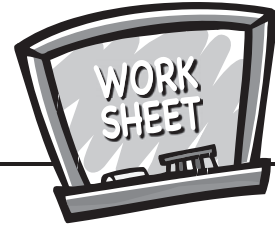
branch

trunk

roots

PROJECT
PLANT IT! ®

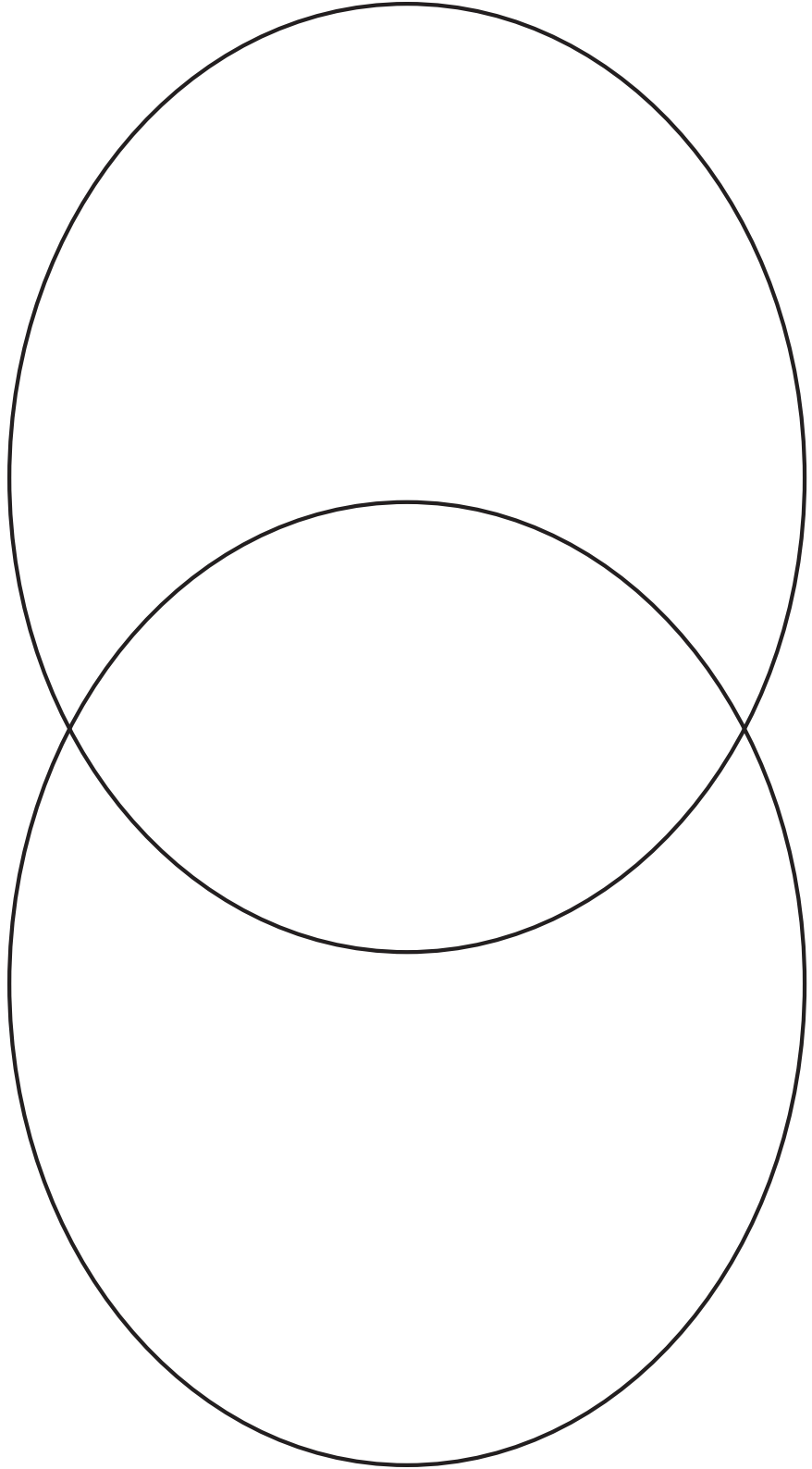Parts of a Tree Worksheet #1

Parts of a Tree Worksheet #2

What do they have in common? How do they differ?

Think about:
- Leaves
- Shape
- Seeds
- Colors in Fall

Evergreen

Deciduous

Lesson 3: Tree-Tac-Toe

Objective:
Students will have fun learning that many different animals, birds and insects make their homes in trees or use trees as a source of food. They will conduct research to learn more about the habitat and environment for some animals, birds and insects that are tree dwellers, and play a fun game together.

Materials Needed:
Tree-Tac-Toe Worksheet, reference books or online reference sources, pencil.

Time:
Probably two sessions of 40 min. each

Procedure:
Teacher introduces this lesson by asking students to name any animals, birds or insects that live in trees or that use trees for food. Make a list on the blackboard. Tell students that they will have an opportunity to learn more about a variety of tree dwellers.

Pass out copies of the Tree-Tac-Toe game sheet. Allow students to work in small groups if that works well in the classroom. Tell students to look up information on the animals, birds or insects on the game sheet, and to mark the box with an "X" when the following information about the creature and its habitat has been researched:

What does it look like?
Where does it live?
What does it eat?
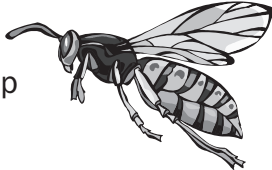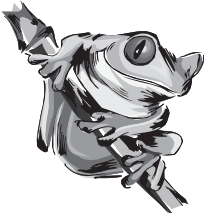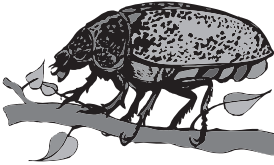What climate does it prefer?
What species of tree does it prefer for its home or food?

Student groups can compete to be the first one to complete a row across, down or diagonally. Students can share their findings with other group members and other classmates.

Results:
Students will appreciate the diversity of life that can be supported by trees as shelter or food.

Tree-Tac-Toe

Animals	Birds	Insects
Koala Bear	Cardinal	Wasp
Howler Monkey	Great-Horned Owl	Butterfly
Tree Frog	Woodpecker	Beetle

Many animals, birds and insects make their homes in trees or use trees as a source of food. Some different examples are shown above.

Look up information on the animals, birds or insects on the Tree-Tac-Toe sheet, and mark the box with an "X" when the following information about the creature and its habitat has been discovered:

- What does it look like?
- What does it eat?
- What kind of tree does it prefer for its home or food?

- Where does it live?
- What kind of weather does it prefer?

Try to complete a column across, down or diagonally. If you are working in a group, share your findings with other group members and with other classmates.

Internet Research
The following Web sites have information on all the animals listed above. Go to www.ProjectPlantIt.com for direct links to these cool sites!

National Geographic Kids
http://kids.nationalgeographic.com/Animals/CreatureFeature

Cyber Sleuth Kids
http://cybersleuth-kids.com

National Geographic
http://animals.nationalgeographic.com

Lesson 4: Identify the Parts of a Leaf

Objective:
Students will be able to identify the parts of a leaf and learn how the leaf helps to feed the tree and, ultimately, release oxygen into the ecosystem.

Materials Needed:
Project Plant It! poster, several different leaves from broad-leaved or deciduous trees (such as magnolia, maple or oak) brought in by the students or teacher, **Project Plant It!** tree seedlings (when they arrive), magnifying glass or hand lens, Parts of a Leaf Worksheet, pencil.

Time:
30–40 min.

Intro:
Using the **Project Plant It!** poster, several leaves from broad-leaved trees and the **Project Plant It!** tree as interactive teaching tools, students will get an up-close look at the parts of a leaf and why it is so important to the life of the tree. Students will use worksheets to reinforce their knowledge of leaves and why they are so important to the life cycle of a tree.

Procedure:
• Teacher shows students the parts of a leaf diagram on the **Project Plant It!** poster and passes out leaf samples brought in, explaining that the parts are easier to see on deciduous leaves versus the evergreen needle. Teacher explains how leaves and needles feed the tree through the web of veins and stomata that run through the leaf to the stem to the branch to the tree. Students are introduced to the process of photosynthesis, by which the leaves use sunlight, carbon dioxide and chlorophyll to create glucose to feed the tree and give off oxygen, which the students and other animals breathe. Teacher reminds students about the cycle of the ecosystem—that we breathe in oxygen provided by the trees, and the trees "breathe" in the carbon dioxide that is released by humans and animals. Teacher encourages students to feel and look at the leaf samples through the hand lens.

**Science experiment: If possible, use a real tree that is outdoors or a large indoor plant to prove that leaves need sunlight to survive, grow and produce the green pigment chlorophyll needed for photosynthesis. Choose a tree/plant that is exposed to sunlight much of the day. Take a sheet of dark paper or foil and carefully clip it to a leaf. After a week of sunshine, take the paper off of the leaf and compare it to the other leaves on the tree/plant. Ask students to describe what they see. Does the leaf need sunlight in order to produce the green pigment chlorophyll and to stay healthy? Ask them to describe their observations and write them down in their classroom journal.

• Teacher passes out **Project Plant It!** tree seedlings. Students feel the leaves or needles, looking closely at all sides of the leaf or needle with a hand lens. Teacher asks students to describe the leaf or needle with different adjectives, i.e., waxy, pointy, smooth, narrow, etc.

• Teacher passes out Parts of a Leaf Worksheet and asks students to identify the different parts of a leaf as shown in the illustration. Students write down three facts about the role of a leaf in the life of a tree.

Lesson 4: Identify the Parts of a Leaf, continued

• Students are encouraged to collect different types of leaves as part of the **Project Plant It!** program, in order to get a better understanding of the many shapes, sizes and varieties of leaves. (Be sure to warn students about picking poison ivy or poison sumac leaves!)

• Use **Project Plant It!** poster to identify samples of leaves brought in by teachers and students.
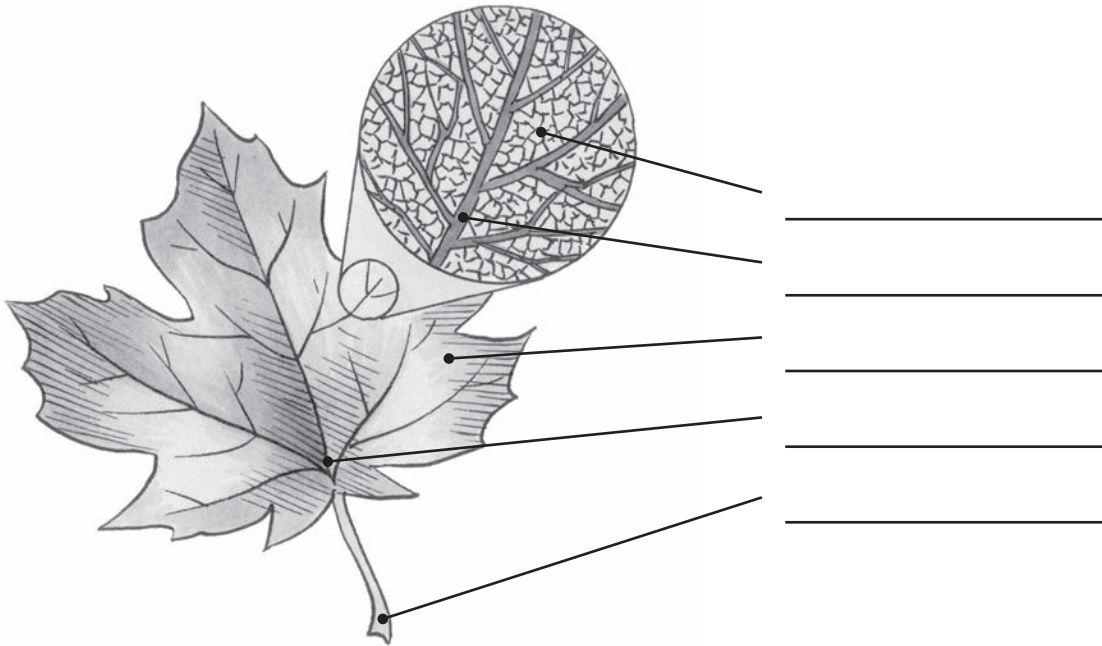
Result:
Students know the parts of a leaf and have a rudimentary understanding of the process of photosynthesis. Students will be expected to use these terms correctly and understand them when they are working on **Project Plant It!** activities.

Parts of a Leaf Worksheet (answer key)

Stomata

Veins

Blade

Rib

Petiole
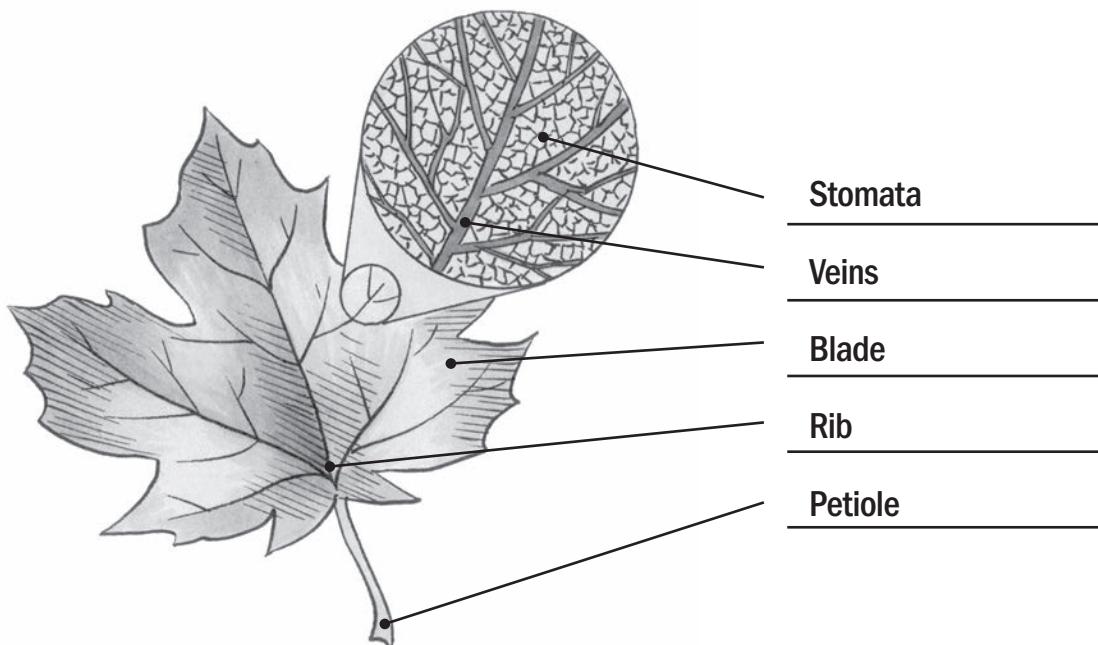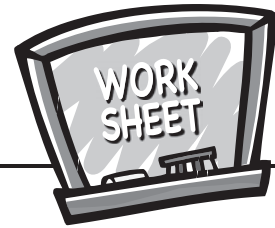
Parts of a Leaf

Write three facts about why leaves are important to trees:

1)_____

2)_____

3)_____

Lesson 5: Trees In Our World

Objective:
Students will be able to name and show the geographic location of six continents that are home to many different tree species. Students will also gain experience in researching and reporting on various tree species.

Materials Needed:
Social Science Worksheet #1 (world map), Social Science Worksheet #2 (student instruction sheet), Thinking About Trees True/False Worksheet, 6 crayons of different colors, pencil and paper, reference materials (books or online sources) about trees.

Time:
Possibly two or three sessions at 40 min. each

Procedure:
Teacher passes out copies of Social Science Worksheet #1 (world map), Social Science Worksheet #2 (student instruction sheet) and Thinking About Trees True/False Worksheet. Tell students that just as people come from different countries and continents, interesting species of trees can be found growing in other parts of the world. Remind students that "native" means a species that is unique to a defined place or region.

Before starting this activity, ask if they can give some examples of animals/reptiles/insects that are native to a country or continent (e.g., kangaroo, panda, cobra, etc.) and explain that plants and trees can also be native to a region.

World Map Activity:
Using their crayons, ask students to color the six continents on the world map according to the color code given on their instruction sheet. Tell them to look at the names of the trees that are native to those continents. Ask students to select a tree from the list and to look it up in a book or online, with the intention of gathering the following facts about its habitat:

What does this tree look like?
Is it coniferous or deciduous?
Does it produce seeds and what do they look like?
Does it have a fruit?
What climate does it live in?

Students can share their findings with the class. If their research shows that a tree is native to a particular country within the continent (e.g., Brazil, China, India), ask students to point out the approximate location of that country on their map.

Check students' work to be sure that they have correctly colored in the continents.

Thinking About Trees True/False Worksheet Activity:
Ask students to work in groups to discuss tree facts and answer related True/False questions.

Result:
Students will sharpen their map discovery skills and also learn more about trees in our communities and around the world.

Social Science Worksheet #1
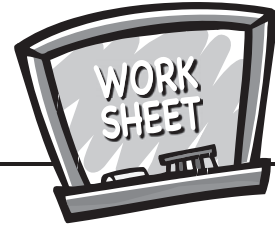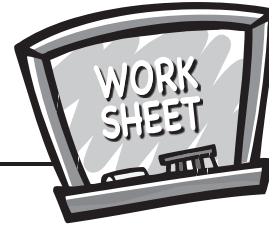
Social Science Worksheet #2 — Student Instruction Sheet

World Map Activity: Below is a list of all the continents where trees grow.

Which continent is missing? _____

Why? _____

Color the continents on your world map with the correct color. The list of trees is just a small sample of the native trees on that continent. Pick a tree that sounds interesting and look it up online or in a reference book. Look for answers to the questions below. Tell the class some interesting facts about it.

AFRICA - RED

Mpingo tree
Syringa tree
Sausage tree
Baobab or Monkey Bread tree
Coral tree

SOUTH AMERICA - BLUE

Cacao tree
Yerba Mate tree
Jacaranda tree
Yellow Mombin tree
Trumpet tree

NORTH AMERICA - GREEN

Hackberry tree
Sandbox tree or Dynamite tree
Calabash tree
Sugar Maple tree
Flowering Dogwood tree

ASIA - BROWN

Gingko tree
Banyan tree
Dove tree
Trident Maple tree
Chinese Fringe tree
Manchurian Cherry tree

EUROPE - YELLOW

Columnar English Oak tree
Strawberry tree
Yew tree
Large-leaved Lime tree
Wild Service tree
Scots Pine tree

AUSTRALIA - ORANGE

Eucalyptus tree
Flame tree
Snow Gum tree
Giant Karri tree
Bottlebrush tree

Pick a tree from one of the continents listed above. Use a reference book or online resource to find answers to the following questions:

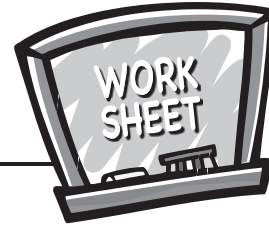What does this tree look like? _____

Is it coniferous or deciduous? _____

Does it produce seeds and what do they look like? _____

Does it have a fruit?_____

What climate does it live in?_____

Thinking About Trees True/False

Read the following facts about trees and how they benefit our neighborhoods, our communities and our environment.

Talk about the facts with other students in your group to make sure everyone in the group understands what is written. Then read the two sentences under the fact. If you think the sentence is **TRUE** put a **T** in front of it. If you think the statement is **FALSE**, put an **F**.

Fact #1
Trees improve the quality of the air we breathe by making oxygen. (This is called photosynthesis.) Trees take carbon dioxide from the atmosphere, and use it to make food for the tree. In this process, trees make oxygen for us to breathe. Also there is pollution in the air that is harmful for us to breathe. Much of the pollution stays in the leaves and is washed into the ground when it rains.

_____ Planting trees on Arbor Day will produce more oxygen for our environment.

_____ Everything in the air is good for us to breathe.

Fact #2
Trees help keep soil from washing away when it rains. The leaves and stems of plants catch the falling raindrops, and a tree's roots hold the soil in place. Trees also help slow the water down so it does not rush downhill and take the soil with it.

_____ Trees make sure that rain gets to the soil.

_____ The side of a hill that does not have trees will lose its soil. A hill that has trees will keep its soil.

Fact #3
Trees can help keep your home cool during the summer. Trees provide shade around our homes by blocking the sunlight. This makes the air in our homes cooler. If the air is cooler, then your air conditioner or fan at home does not need to run so much and less electricity will be needed to cool your home. Three shade trees can save $100–$250 in electricity costs each year!

_____ A home that is near a lot of trees will probably spend less on electricity for air conditioning than a home with no trees or very small trees.

_____ Trees block the sun to make the air around us warmer.

Fact #4
In the winter, trees block the cold winter wind. This helps our homes stay warm. With more trees we will need less electricity to run the heaters in our homes. It is best to have a row of evergreen trees and shrubs with branches that are low to the ground surrounding a house or building. These trees can protect the side of a building where the wind will be blowing.

_____ Deciduous trees block the wind better than evergreen trees.

_____ Trees block the wind in the winter so our homes are easier to keep warm.

Lesson 6: Math and Fractions in the Forest

Note to Teacher: Each student should receive 3 copies of the Tree Pieces Worksheet, located on page 37, so they can work each of the problems.

Objective:
Students will be able to express number values in fractions and in decimals. Also, the student will use multiplication skills to increase numbers in proportionate amounts.

Materials Needed:
Math and Fractions in the Forest Worksheet, Tree Pieces Worksheet, pencil, paper.

Time:
40 min.

Intro:
Teacher reminds students how to increase numbers by a proportionate amount (e.g., A box holds 12 pens. If the box were five times bigger, how many pens would it hold? Answer: 60)

Procedure:
Teacher passes out Tree Fractions and Decimals Worksheet, assists students as needed.

Result:
By visualizing numbers as trees in a forest, students can better understand how fractions and decimals represent a portion of a whole. Also, they can work with increasing numbers in proportionate amounts.
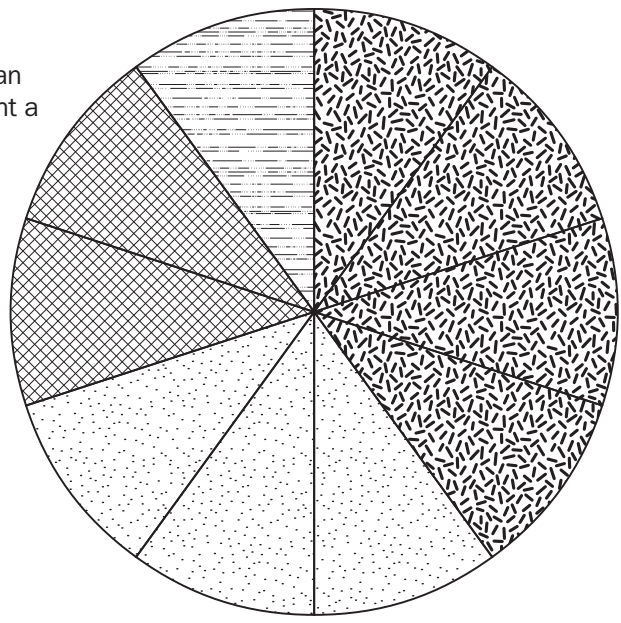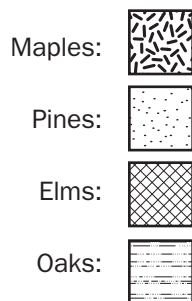
Answer Guide for Teachers:

How many total trees: 10

Tree species expressed as a fraction:

Maples: 4/10
Pines: 3/10
Elms: 2/10
Oaks: 1/10

Tree species expressed as a decimal:

Maples: .4
Pines: .3
Elms: .2
Oaks: .1

Number of tree species in larger forest:

Maples: 12
Pines: 9
Elms: 6
Oaks: 3

Number of total trees in larger forest: 30

Maples:
Pines:
Elms:
Oaks:

Math and Fractions in the Forest

A forest is filled with many different species of trees:

4 Maples
3 Pines
2 Elms
1 Oak

How many total trees are in this forest?

_____

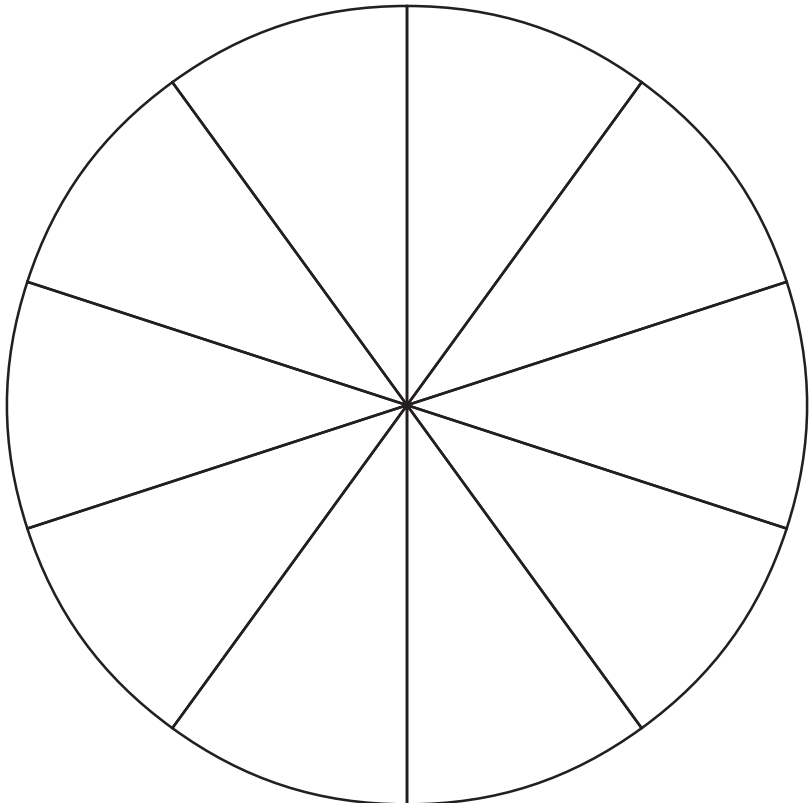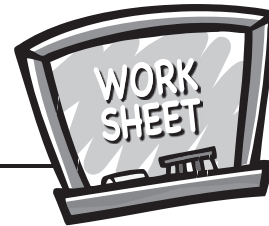Express each species within the forest as a number fraction.

Maples [ ]

Pines [ ]

Elms [ ]

Oaks [ ]

Express each species within the forest as a decimal.

Maples [ ]

Pines [ ]

Elms [ ]

Oaks [ ]

Use the pie chart below to show the percentage of Maples, Pines, Elms and Oaks in the forest.

Pick a color for each kind of tree and color the chart.

Math and Fractions in the Forest, continued

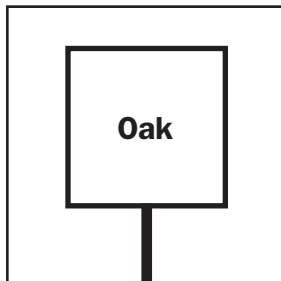If another forest is bigger with 3 times the number of each type of tree, how many of each species would be in the bigger forest? Cut out the tree pieces and create a forest on your desk.

Maples

Pines

Elms

Oaks

How many total trees are in the larger forest?

_____

Tree Pieces

Maple	Maple	Maple	Maple

Pine	Pine	Pine

Elm	Elm

Oak
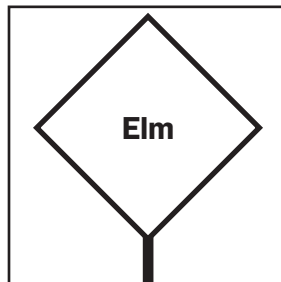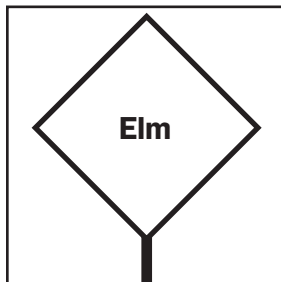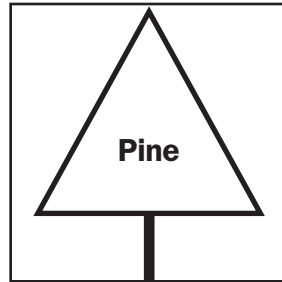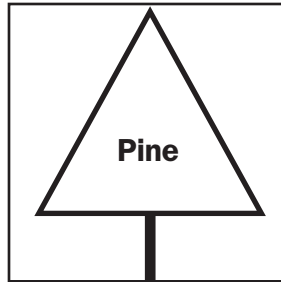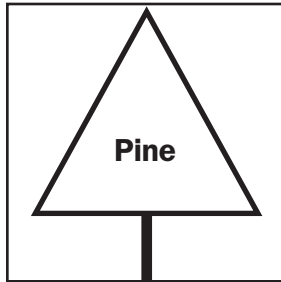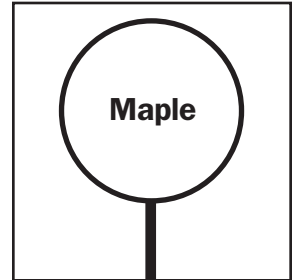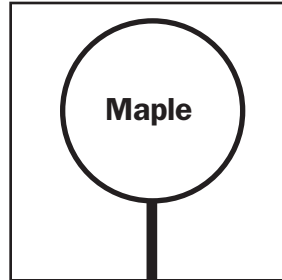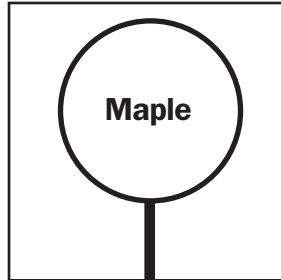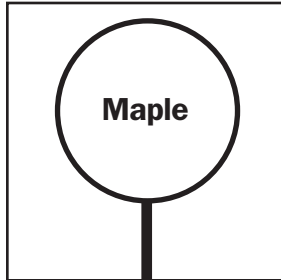
Lesson 7: Tree Product Scavenger Hunt

Objective:
Students will learn to identify many tree products that they use on a daily basis at school, at home and at play.

Materials Needed:
Tree Product Scavenger Hunt Worksheet, pencil.

Time:
30–40 min.

Intro:
Teacher tells students that this is a group activity designed to help them realize how a tree benefits them in countless ways every day.

Procedure:
Teacher will divide students into small groups. Pass out copies of Tree Product Scavenger Hunt Worksheet. Each group will walk around the classroom and make a list of every item that they think is made from a tree or that comes from a tree. Groups can also brainstorm about other non-classroom tree products such as rubber for car tires, wood for their house and baseball bats, fruit on their cereal, etc. After about 20 minutes, each group shares its list. Some examples might include: telephone poles, pencils, hockey sticks, popsicle sticks, newspapers, comic books, textbooks, paper towels and toilet paper, envelopes, cereal boxes, maps, computer paper, wrapping paper, boats, bridges, furniture, rubber, baskets, toys, apples, nuts, other fruits, other food products, and many more. Teacher can compile the group lists into one master list of all the different products to post on the bulletin board with the **Project Plant It!** poster.

Result:
This group activity demonstrates that collective thinking expands the scope of creative ideas to accomplish the activity in a short space of time. Students will be surprised at the length of the master list. Teamwork makes the difference!
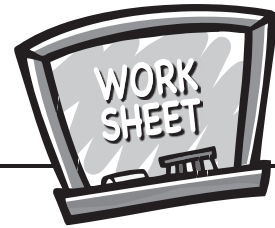
Tree Product Scavenger Hunt

Have you used something that came from a tree today? Work with your classmates to list the tree products
that you use at school, at home or at play.

SCHOOL	HOME	OTHER
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	
_____	_____	
_____	_____	

Lesson 8: Tree Book Report

Objective:
Students will be able to design a creative book report and make a presentation to the class about a book with a tree theme.

Materials Needed:
Tree Reading List (page 54), art supplies.

Time:
Several sessions at 30 min. each

Procedure:
Teacher passes out copies of Tree Reading List and asks students to pick a book that they will find at the library. If multiple students choose the same book, that's OK. Ask students to prepare a book report using one of the art designs listed below:

1. Design a bookmark based on the book. Both sides of the bookmark can be decorated.

2. Make a CD jewel case insert that illustrates the book's theme.

3. Make an illustrated book cover about the book. Make it the size to fit a typical textbook.

4. Make a design for a video game about the selected book and explain how you would play the game.

5. Create a diorama or another 3-D design that carries out the theme of the book.

Result:
Students will expand their creativity and verbal skills by illustrating and presenting their tree book reports.

Lesson 9: Understanding Energy

Objective:
Students will be able to define energy and to investigate different sources of energy in their lives. Students will understand how different sources of energy are used to power machinery and equipment used in their home and in business. Students will also be able to distinguish between renewable and non-renewable energy resources. Students will be able to identify easy ways to conserve energy at home or school.

Materials Needed:
• Energy Toolbox containing a piece of fruit and a vegetable (plastic or real), a piece of charcoal, a light bulb, a small branch or small piece of firewood, a battery, a pinwheel, a bottle of water and a picture of the sun and picture of a nuclear power plant (see Energy Toolbox Reference Sheet for Teachers).

• Home Energy Audit Worksheet

• Student Resource Worksheet for Energy Reports

Time:
Three activity sessions of about 30 minutes each. The fourth activity (Energy Conservation Tips) only takes a couple of minutes each day.

Procedure:
See directions below for each of the activities in this lesson plan.

Result:
Students will understand the impact of energy sources in all aspects of their lives, and will be able to articulate their discoveries to their families and other classmates.

Activity #1: Sources of Energy
• Teacher asks students what gives them energy and what their energy allows them to do (work). For example, an apple gives you energy to do all sorts of things like ride a bike, shoot basketball or read a book. Explain that like the apple, there are other things that contain energy (energy sources) and that like people, there are other things that use energy. Teacher asks students for examples of things that contain energy and examples of things that use energy.

• Teacher asks students if they know the definition of renewable energy sources (energy that comes from naturally occurring, inexhaustible resources like water, wind, biomass, etc.) and non-renewable energy sources (energy that comes from a source that cannot be re-created, produced or grown, such as fossil fuels, oil, natural gas).

• Teacher holds up each item in the Energy Box and asks students how the item represents a form of energy, and asks students to vote by show of hands on whether the item represents a renewable or non-renewable source of energy (see Energy Toolbox reference sheet for correct answers).

• Point out the items that are considered symbolic of "fossil fuels" that come from the remains of prehistoric plants and animals (charcoal).

• Invite discussion on the items and how they are important sources of energy for people or things/appliances to operate effectively and to "do the work" that is required.

Lesson 9: Understanding Energy, continued

• Students are encouraged to tell their families about the items in the Energy Toolbox and how those items are sources of energy.

Activity #2: Home Energy Audit
• Teacher explains that an audit is an evaluation process, where information is gathered and reviewed so that improvements can be recommended.

• Teacher tells students that they will be participating in a home energy audit, in order to review all of the ways that energy is used in their daily lives.

• Teacher asks students why a home energy audit might be helpful and what results it might achieve.

• Teacher hands out copies of Home Energy Audit Worksheet. Students are given a homework assignment to walk around their home and yard and write down the names of every device or appliance that uses energy of any kind to run. Ask students to think about all types of energy sources that are used, such as a fireplace, wood stove or solar-powered garden lights, not just electricity.

• Teacher asks students why a home energy audit might be helpful and what results it might achieve.

• Students will then be asked to put an X beside any of the items that they think aren't absolutely necessary to living comfortably. Students will collaborate on this project as they share their lists and give opinions about what items they think are most important and what items that could be used less often or not at all.

Activity #3: Energy Reports and Class Quizzes
• Teacher divides the class into 5 energy teams: Solar, Wind, Water, Fossil Fuels, and Nuclear.

• Teacher gives each team a copy of the Student Resource Worksheet for Energy Reports.

• Each team researches its assigned form of energy on the Internet and develops a list of at least 10 interesting facts or statistics to share with the class.

• Teams will also research and share a brief report on how their assigned source of energy is harnessed to do things like create heat, operate machinery, generate electricity/power, etc.

• Teams will brainstorm among themselves about the advantages and disadvantages of using the different sources of energy for different purposes and be prepared to share some information in their class reports.

• Each team will then create a short quiz based on the information that they shared with the class. Teams can create any type of quiz they want, such as true/false, fill in the blank, or multiple choice. Teams give their quizzes to the rest of the class, and give encouraging comments to their classmates for doing a good job on the quiz.

Lesson 9: Understanding Energy, continued

Activity #4: Energy Conservation Tips
• Using online research*, students will find simple tips to conserve energy that they can share with their classmates and families.

• Teachers are encouraged to check with the school's office to see if the students participating in Project Plant It! could share an energy conservation tip each day during the morning announcements on the school's public address system. This would enable Project Plant It! students to be seen as role models in the school's ongoing energy conservation efforts.

* Example: More than 100 energy conservation tips can be found on Dominion's website at **https://www.dom.com/about/conservation/daily-tips.jsp**.

Energy Toolbox Reference Sheet for Teachers

Fruit and/or vegetable – Renewable source of energy as food for people and animals.

Sun photo (or point to it) – Renewable source of energy. Solar energy is converted into sugar during photosynthesis to fuel plant growth, and solar energy provides an economic heating source for homes and buildings.

Bottle of water – Renewable source of energy. Pour water into cup to simulate water power that is used to generate electricity in hydroelectric plants.

Pinwheel – Renewable source of energy. Blow on it to simulate wind power that is used to generate electricity with turbines (if possible, find photo of wind turbines in action).

Branch or firewood – Renewable source of energy as long as a tree is planted for each one that is cut down. Many homes and buildings are heated with wood-burning appliances.

Charcoal – Non-renewable source of energy (coal). Coal is burned in homes and in machinery.

Light bulb – Electricity can come from renewable and non-renewable sources.

Battery – This is tricky! The power from a battery can be renewable if it's recharged, but usually a battery is considered a non-renewable resource.

Nuclear plant photo – Nuclear power comes from uranium, which is a non-renewable resource.
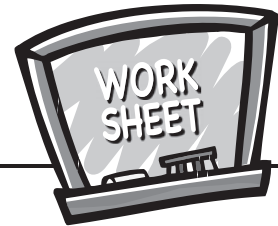
Home Energy Audit Worksheet

List items in your home that need a form of energy to operate effectively.

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

❏ _____   ❏ _____   ❏ _____

Student Resource Worksheet for Energy Reports

Helpful Websites about Solar Energy
• http://www.facts-about-solar-energy.com/facts-about-solar-energy.html
• http://www.renewablepowernews.com/archives/1299
• http://www.solarenergy-facts.org

Helpful Websites about Water Energy
• http://interestingenergyfacts.blogspot.com/2008/03/hydropower-facts.html
• http://www.eia.gov/kids/energy.cfm?page=hydropower_home-basics

Helpful Websites about Wind Energy
• http://environment.nationalgeographic.com/environment/global-warming/wind-power-profile
• http://windeis.anl.gov/guide/basics/index.cfm
• http://www.conserve-energy-future.com/WindEnergyFacts.php

Helpful Websites about Fossil Fuels
• http://www.api.org/oil-and-natural-gas-overview/classroom-tools/teaching-tools/facts-fossil-fuels.aspx
• http://interestingenergyfacts.blogspot.com/2009/09/fossil-fuels-facts.html
• http://www.greenlivingtips.com/articles/333/1/Fossil-Fuel-Fast-Facts.html

Helpful Resources on Dominion's Website
• http://www.e-smartonline.net/dom/index.php
• https://www.dom.com/about/stations/index.jsp

Facts or Statistics:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

Lesson 10: Planting a Tree!

Note to Teacher: We recommend that this lesson be taught the week of Arbor Day, using your classroom seedling from **Project Plant It!** This lesson will model the planting process that students are to duplicate at home. If planting the seedlings on school property is not possible, we suggest contacting your local Parks and Recreation Department to determine where to best plant and care for the seedlings.

Objective:
As students plant the seedling, they will:
• apply their knowledge of the needs of living things to choose appropriate location
• estimate various heights
• correctly use a 12-inch ruler to measure area
• identify the different components of soil
• accurately describe the function of roots

Materials:
Trees, rulers, shovels, tree planting guide, chart paper, overhead projector

Time:
1 hour

Procedure:
• Do not plant trees underneath or within 25 feet of an overhead power line. Do not plant trees on top of underground power, cable, phone or gas lines. To ensure your safety, call 811 before you dig.

• Teacher asks, "What do we need to know or think about in order to plant our trees?" Record responses on chart paper or overhead projector.

• Pass out tree planting guide (page 53) and the Planting a Tree Worksheet.

• Read through the planting directions together as a class. **(The directions are also located on the inside of the seedling tube label.)** Discuss needs of living things, filling out question #1. In pairs, have students identify the source of the trees' food. Discuss as class. Then go through water, air, light, and place to grow, making connections first in pairs, then discussing as a class.

• Draw a diagram (#2 on the worksheet) of the tree and label where the tree will get all of its needs. Teacher models on overhead projector.

• See if anyone can find out how tall and wide the tree seedlings will grow. Using the Tree Planting Guide on page 53, discuss what the class will need to consider when choosing where to plant the seedlings (proximity to overhead power lines and underground power, cable, phone or gas lines). Use a ruler and yardstick to try to estimate the height and width of the seedlings when fully grown. Discuss how many students stacked head to toe, and how many classrooms stacked on top of each other, it would take to reach the height of the fully grown tree.

Lesson 10: Planting a Tree!, continued

• Split students into groups of 3 or 4. Roles: digger, soil observer, hole measurer, habitat observer. Each group should have a shovel and ruler. After explaining expectations when going outside, class goes to planting site.

• Teacher models how to look around and above and test the soil to find a good spot. Then the teacher will remove weeds and measure out 1-foot circle. When weeding, demonstrate how the roots of a small weed hold the soil in place. Discuss how much soil the roots of a huge tree keep in place and how that prevents erosion, or the soil being carried away. Then plant and water the tree seedling.

• Students break into groups and record what types of soil components they see in the topsoil (rock, clay, silt, sand, humus).

• After the tree seedlings are planted, gather the class together to identify the ways they have helped the environment. Look specifically for the following responses about tree planting: provides a renewable resource, prevents soil erosion, enables the absorption of carbon dioxide and release of oxygen, and reduces pollution and harmful greenhouse gases (#6 on worksheet).

• Go back inside and finish recording information on worksheet. Collect for assessment.

Result:
Students will plant trees while reviewing measurement, soil, living things, and erosion.

Additional Writing Activity:
Discuss the importance of using the senses to enhance your students' writing. Have students sit by their tree for 2-10 minutes with a notebook and write what they think the tree (if it were personified) would hear, see, smell, taste, and feel. Use this information to write a descriptive piece in the voice of the tree.

Planting a Tree (answer key)

1. What does our tree need to live?

   food, water, air, light, place to grow

2. Draw a picture diagram of where we will plant our trees and how they will get everything they need.

   (food from nutrients in soil, water from hose and rain and groundwater, air around it, light from sun, room to grow)

3. What will we look for when we choose a spot to plant?

   The tree should be planted:

   · at a safe distance from overhead power lines: at least 25 feet

   · at a safe distance from underground power, cable, phone or gas lines.

   · in a location that will receive direct sun and has well-drained soil

Planting a Tree (answer key), continued

4. What are the five components of soil?

   rock, clay, silt, sand, humus

5. Which components of soil did you see?

6. List at least three ways planting a tree helps the environment.

   Planting a tree helps the environment by:

   · providing a renewable resource

   · preventing soil erosion

   · absorbing carbon dioxide and releasing oxygen

   · reducing pollution and harmful greenhouse gases

7. Using complete sentences, write a paragraph about why you chose the place you did to plant your tree.
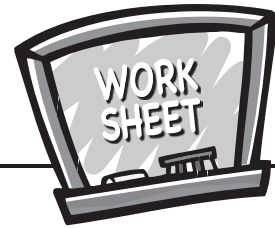
Planting A Tree

1. What does our tree need to live?

_____

2. Draw a picture diagram of where we will plant our trees and how they will get everything they need.

```




```

3. What will we look for when we choose a spot to plant?

_____

_____

_____

_____
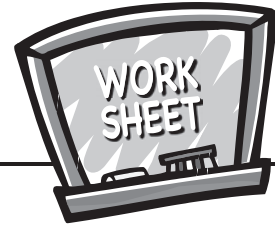
Planting a Tree, continued

4. What are the five components of soil?

_____

5. Which components of soil did you see?

_____

6. List at least three ways planting a tree helps the environment.

_____

_____

7. Using complete sentences, write a paragraph about why you chose the place you did to plant your tree.

_____

_____

_____

_____

_____

_____

_____

Lesson 11 – Watch It Grow!

Objective:
Students will measure the growth of their tree seedlings to the nearest half-inch and chart the growth using a data table and graph.

Materials:
Rulers, yardsticks, blank graphs and data tables.

Time:
15 minutes, once a week

Procedure:
As a class and/or individually, students will keep a table and graph of how tall their tree seedlings grow. The day the tree seedlings are planted, the students will measure the height from soil to the top of the seedling. Record the date and height in a data table. As a class, set up a graph with title, scale and labels. Use a line or bar graph like the ones illustrated below. Update weekly or biweekly. Emphasize the importance of keeping the measuring points constant and measuring carefully.

Result:
Students will learn to collect data and graph something meaningful to them.

Additional Activities:
1. You can also measure the water used to water the tree when you go out to measure the height. Discuss how many pints in a quart, in a gallon, etc.

2. Have the students measure their trees at home and complete a growth chart. Have them compare the growth of their home tree to the class tree. Are they growing at the same rate? Why or why not? What factors could be involved? Amount and frequency of watering? Amount of sunlight? Different soil conditions?

Height of Tree Over Time
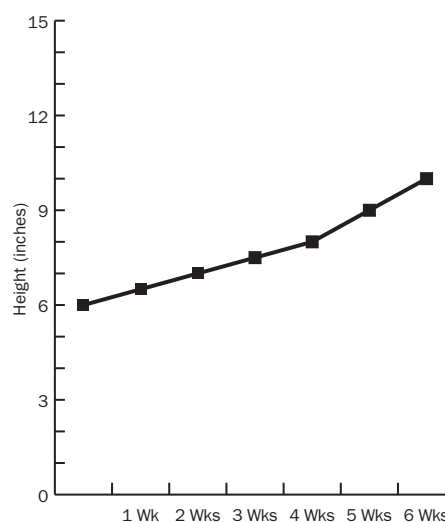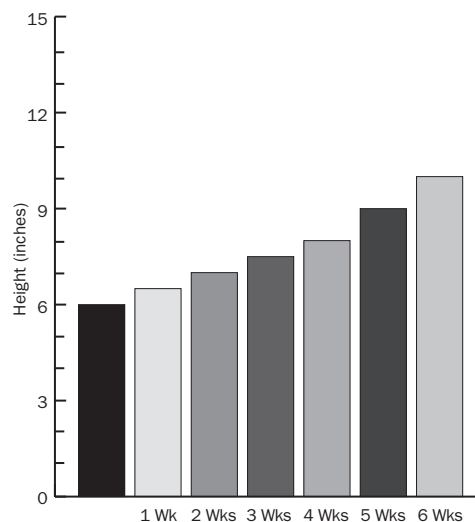
More Tree Fun

More Project Plant It! Activities

Although **Project Plant It!** concludes with tree-planting ceremonies at the school or at home on Arbor Day, many students will want to continue learning about the fascinating world of trees. Here are just a few suggestions of educational activities for all young tree lovers and their families:

Start a Leaf Collection

The best way to learn about different types of trees is to start with a leaf collection. Students will quickly realize that leaves come in all shapes, sizes and colors, especially in the fall. Leaves can be pressed between pieces of wax paper, flattened under a heavy book and mounted in a notebook or scrapbook. Students can use the **Project Plant It!** poster to identify the leaf and label it properly in their collection. A leaf collection can be the first step to a lifelong love of trees.

Remind students to collect leaves in the fall after the deciduous trees have changed color. When the energy of the sunlight decreases in the fall, leaves do not produce the same amount of green pigment (chlorophyll) that they do in the spring. As the green pigment fades, the result is a burst of color from the other pigments that were underneath the green all along. A student's leaf collection can also be virtual from research on Web sites or reference books. They can also draw pictures or use clip art if real leaves are not readily available.

Begin a Tree Journal

Many famous authors found inspiration from nature and the quiet strength of trees. Students might enjoy reading a youth biography of Henry David Thoreau, an American writer who kept a journal of his thoughts about nature and much preferred the company of trees to people. Students can write about their plans and dreams in a journal, as well as working on their creative writing projects such as a poem or story. They can relax with their journal under a big shady tree in their yard or in a public park and let their imaginations soar to the crown of leaves above them.

Create a Tree Guidebook

Students who enjoy photography or drawing can use their skills to compile a detailed Tree Guidebook of the trees near their home or school. Along with photos or art depictions of the trees, leaves, fruit and seeds, the Guidebook can contain actual samples of these items such as a pressed leaf, a twig or a dried seed. The student's friends and family will be very impressed to know a real tree expert.

Make a Bark Rubbing

Hold a large piece of heavy white paper to a tree. Using a crayon, rub lightly back and forth on the surface until the raised parts of the bark make a mark on the paper. This is a great way to learn more about the different species of trees around the school or in the students' neighborhoods. Encourage students to share their bark rubbings with the class.

More Project Plant It! Activities, continued

Read about Famous People Who Loved Trees

All of the people below loved the outdoors, especially trees, and dedicated their lives to protecting and preserving our natural world. Students can read more about these well-known environmentalists, among many others, in youth biographies or at **www.ProjectPlantIt.com**.

J. Sterling Morton — founder of Arbor Day
http://www.arborday.org/arborday/history.cfm

Johnny Appleseed — the traveling apple seed man
http://www.appleseed.net/

John Muir — founder of The Sierra Club
http://www.dep.state.fl.us/SECRETARY/kids/pioneers/muir.htm

Tree Trivia

Pass out copies of Tree Trivia sheet on page 55. Encourage students to read these interesting facts about trees and to keep adding cool facts to this list.

Recommended Activity:
Project Plant It! Creativity Showcase for Your School

Encourage all participating students at the school to create original works of art to show their love of trees.

Here are some suggestions to get your contest started:

Suggested Theme: WHAT TREES MEAN TO ME

Categories

Literature
This includes any original creative writing in fiction or nonfiction such as a story, poem, essay or drama. If English is not the student's primary language, the student may submit the entry in another language with some form of translation.

Music
This includes any original musical composition submitted on paper or audio tape with or without words on any instrument with a maximum length of five minutes.

Visual Arts
This includes any original two-dimensional visual arts creation such as a poster, painting/drawing, photograph, computer-generated art or collage.

Rules
• All entries should be original works by an individual student or a group of students
• Set a deadline when all entries are turned in; announce winners on Arbor Day
• Provide an entry form such as the one shown at the bottom of this page; an entry form must be attached to each entry
• Entries are judged by selected teachers
• Offer prizes for category winners; inexpensive prize suggestions include a free homework pass, store-bought stickers or teacher-created certificate

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SAMPLE ENTRY FORM — please complete this form and attach to each entry

Student Name(s)_____ Grade _____

Title of Entry_____

Category _____

Tree Planting Guide for Students and Parents or Guardians

Whether you will be planting your **Project Plant It!** tree outdoors or indoors, follow these instructions to ensure that your tree grows up strong and healthy.

How to plant your tree seedling outdoors
• Select a sunny location with moist, well-drained soil.
• Remove all weeds, grass and other debris from a 1-foot circle around the site.
• Dig a saucer-shaped hole 6 inches across. This lets the roots spread as the tree grows.
• Turn the soil in your hole approximately 6 inches deep and break up any big chunks.
• Remove your seedling from the tube and take the plastic wrapper off the root plug.
• Place the root plug just below the surface of the soil, so that the roots are completely covered.
• Make sure you do not plant the seedling too deep. About an inch of soil on top is plenty.
• Water the seedling and, if possible, cover your planting site with 2–3 inches of mulch.
• Do not let the mulch touch the tree. This helps keep disease away from the tree.
• Water your seedling when it gets dry every week or two during the first year.

How to grow your tree seedling indoors in a container
• Choose a 1-gallon container with drainage and enough room for the roots to grow.
• Add soil.
• Remove your seedling from the tube and take the plastic wrapper off the root plug.
• Place the root plug just below the surface of the soil so that the roots are completely covered.
• Make sure you do not plant the seedling too deep. About an inch of soil on top is plenty.
• Keep your seedling watered about every week as it gets dry.
• Plant your seedling outside in the ground as soon as possible.

How to store your tree seedling
If you cannot plant your seedling right away, do not worry. You can actually store it for a short time in your refrigerator. Put your tree tube in the vegetable bin to keep it cool and safe.

Important Safety Tips
• Do not plant trees underneath or within 25 feet of an overhead power line. Do not plant trees on top of underground power, cable, phone or gas lines. To ensure your safety, call 811 before you dig.
• Remember: never climb a tree that is near power lines.

Tree Reading List

Note to Teacher: The list below represents only a very small sample of the available resources about trees. If you Google "Trees," for example, more than 11 million references are cited! Library shelves are full of books about trees, leaves, rainforests, plants and every other tree topic imaginable. Students can easily read these suggested age-appropriate books that complement the **Project Plant It!** program. There is also a list of books for teachers and parents/guardians who want to join the students in their quest to understand the world around them.

Suggested Books about Trees for Third Graders

A Tree is a Plant by Clyde Robert Bulla

A Tree is Growing by Arthur Dorron

Be a Friend to Trees by Patricia Lauber

Discovering Trees by Douglas Florian

Flowers and Trees by Time Life Books

The Giving Tree by Shel Silverstein

The Great Kapok Tree by Lynne Cherry

Leaves by Rena Kirkpatrick

Leaves and Trees by Elaine Pascoe

Mighty Tree by Dick Gackenbach

Outside and Inside Trees by Sandra Markle

Sky Tree by Thomas Locker

Trees by Martyn Hamer

Trees by Andrew Langley

Trees by Jonathan Pine

Trees by Illa Podendorf

Suggested Books about Trees for Teachers and Parents

Last Child in the Woods: Saving Our Children from Nature Deficit Disorder by Richard Louv

Picture Guide to Tree Leaves by Raymond Wiggers

Science Project Ideas about Trees by Robert Gardner

State Trees by Sue Brandt

Tree by David Burnie (Eyewitness Book series)

Tree Almanac: A Year-Round Activity Guide by Monica Russo

Trees by Allen Coombes
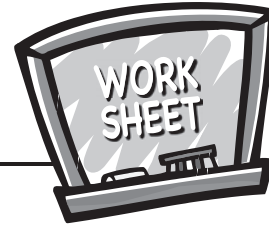
Trees by Linda Gamlin

Suggested Web Sites about Trees, Energy and the Environment

American Forests: www.americanforests.org

Dominion Resources: www.dom.com

National Arbor Day Foundation: www.arborday.org

TreeLink: www.treelink.org

Tree Trivia

Here are some fun facts about trees. Do some research on your own and add more "tree trivia" to this list!

Large oak trees with 700,000 leaves may release 150 gallons of water a day.

An oak tree can drop more than 50,000 acorns in one year.

Over a lifetime, one tree will:
• provide a day's worth of oxygen for up to four people
• remove approximately 14 lbs. per year of carbon dioxide from the atmosphere
• recycle $37,500 worth of water

Trees can live longer than any other plant or animal.

The oldest known tree in the world, a bristlecone pine, was 5,000 years old when it died. The oldest tree still living is also a bristlecone pine that is over 4,600 years old.

The biggest living thing in the world is a Giant Sequoia tree in California called General Sherman. It is estimated to weigh 2 million pounds and is 270 feet high.

The biggest forest in the world is in the north of Russia. It stretches over 2.7 billion acres.

It takes 30 gallons of sap to make one gallon of maple syrup.

Growth rates of trees can vary. Fast-growing trees can reach 40 feet in 40 years, but the bristlecone pine takes 1,000 years to reach 40 feet.

The heaviest timber in the world comes from the Black Ironwood tree which grows in South Africa.

The tallest tree still standing is a Mountain Ash in Tasmania. It is 325 feet tall and still growing.

The only places in the world where trees do not grow are deserts, extremely cold places (such as Antarctica and the Arctic) and very high mountain peaks.

On a warm day, a large tree can take in as much as 260 gallons of water.

Trees are usually considered mature when they first bear flowers, fruit or seeds. This can take up to ten years to occur for the first time.
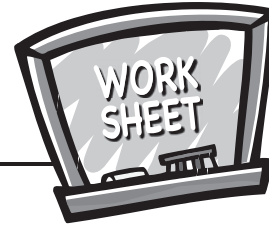
Poems and Cheer

Please use these works to help your classroom and school celebrate Arbor Day and inspire your students to create poems, cheers and songs of their own.

"In Time of Silver Rain" by Langston Hughes.

In time of silver rain
The earth
Puts forth new life again,
Green grasses grow
And flowers lift their heads,
And over all the plain
The wonder spreads
    Of life,
    Of life,
    Of life!

In time of silver rain
The butterflies
Lift silken wings
To catch a rainbow cry,
And trees put forth
New leaves to sing
In joy beneath the sky
As down the roadway
Passing boys and girls
Go singing, too,
In time of silver rain
    When spring
    And life
    Are new.

TREE CHEER
written by Brenda Green
Originally performed by the cheerleaders of
Clark Springs Elementary School, Richmond, VA

PLANT TREES

Plant, plant, plant the tree,
Water that tree; and
Watch it grow.

Keep, keep, keep it up,
Love that tree; and
Watch it grow.

Plant, plant, plant the tree,
Water that tree; and
Watch it grow.
Gro-o-o-o-ow trees!

When I say "Plant the" you say, "Trees"!
"Plant the" ("Trees")!
"Plant the" ("Trees") !

When I say "Water" you say, "Grow"!
"Water" ("Grow")!
"Water" ("Grow")!

When I say "Love the" you say, "Trees"!
"Love the" ("Trees")!
"Love the" ("Trees")!
Gro-o-o-o-ow trees!

Thank you all you Arbor Day Fans!
Let me hear you clap your hands,
Now that you got that beat,
Let me hear you stomp your feet.
Now that you got that groove,
Let me hear your body move.
Ah-woo-ga!
Ah-woo-ga!
Ah-woo-ga!
Thank you all you Arbor Day Fans!

PROJECT
PLANT IT!

Sponsored by Dominion, one of the nation's largest producers of energy, **Project Plant It!** is a community effort to educate children, plant trees, and improve the environment.