Dear Educator,

Thank you for joining third, fourth, and fifth grade teachers throughout California in teaching today’s youth about the benefits of trees in our cities and towns. Trees provide not only beauty to our communities, but also many things that often go unnoticed - trees produce and conserve energy, filter our water supply, and even increase students’ concentration and reduce obesity!

We hope that you’ll use these activities throughout the school year and that your class will join us in March as we celebrate California Arbor Week. California ReLeaf, the California Department of Forestry and Fire Protection, and the California Community Forests Foundation are proud to have California’s educators as our partners to green California’s communities!

Activity A: Identifying a Tree’s Value
Activity B: Keyword Word Search

Activity A: What Are Urban & Community Forests?
Activity B: Trees in my Community
Activity C: Tree Jobs

Activity A: Name That Tree
Activity B: Measuring Trees

All lessons meet California Science Content Standards.

For more ways to participate, visit arborweek.org.
California Science Content Standards:

Life Science 3.3-a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Life Science 3.3-c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

Life Science 4.2-a. Students know plants are the primary source of matter and energy entering most food chains.

Life Science 4.3 Living organisms depend on one another and on their environment for survival.

Life Science 4.3-c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

Life Science 5.2-f. Students know plants use carbon dioxide (CO2) and energy from sunlight to build molecules of sugar and release oxygen.

Objectives:
- To understand the relationship between trees and humans.
- To understand the different benefits of a tree.

ACTIVITY A

Identify the great value trees bring to people by having the students identify the benefits that trees provide. List these benefits on a board or chart. Examples can include:

- Trees release oxygen into the air.
- Trees absorb harmful carbon dioxide from the air (An acre of trees absorbs the amount of carbon produced by driving a car for 26,000 miles.)
- Trees give us shade from the sun and a cool place when it’s hot. (Just three strategically placed trees can decrease utility bills by 50 percent.)
- Trees provide a home for wildlife and shelter for humans.
- Trees produce fruit and nuts for animals and humans to eat.
- Tree roots prevent soil runoff and eliminate it from washing away.
- Trees provide hundreds of products, which we use everyday (paper, benches, baseball bats, etc.)
- Time spent among trees and in green spaces reduces stress levels in both adults and children.
- Trees give us beautiful areas for camping, hiking, and playing.
- Students with a view of trees perform better on tests and concentrate better.
- People who live in tree-lined neighborhoods are three times more like to be physically active and 40% less likely to be overweight.

ACTIVITY B

Students will try to find the many ways trees are important by searching for key words in the crossword puzzle (attached). Once the students have found as many words and they can, have each student share with a partner and explain why all of the found words are significant in relation to trees.
How many of these words can you find?

CAMPING  FRUIT  PLAYING  STRESS REDUCTION
CARBON DIOXIDE
CONCENTRATION
EXERCISE       HIKING  RUNOFF    WILDLIFE
PAPER
SHADE
SHELTER
California Science Content Standards:

Life Science 3.3-d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

Life Science 3.3-c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental, and some are beneficial.

National Standard 4.3-4 Many people choose science as a career and devote their entire lives to studying it. Many people derive great pleasure from doing science.

National Standard 8.7-1 People engage in the activities of science, engineering, and environmental related fields. Some professionals work in teams, and some work alone, but all communicate extensively with others.

Objectives:
- To identify the many professions that relate to the study of trees.
- To understand the meaning and importance of urban forestry.

BACKGROUND FOR TEACHERS:

What is an urban or community forest? An urban or community forest is comprised of trees and other vegetation in and around our communities, including the trees in our yards and along residential streets, in parking lots and along commercial thoroughfares, on school grounds, and in parks and open spaces.

Why are urban and community forests important? Healthy urban and community forests are integral to the ecological, economic, and social well-being of our communities. From cleaning our air and water to saving energy through cooling shade, from raising property values to rekindling neighborhood pride, from providing places for children to play to providing homes and food for wildlife, our communities’ trees have a lot to offer. When selected, planted, and cared for properly, trees can improve the quality of our lives for decades to come.

Have students think about all the trees they see on an every day basis. Thinking back on how they use trees (from Lesson One), have the students try to imagine their world without trees. Each student will have the opportunity to act as a urban and community forester. He/she will be given eight trees to plant in a community where no trees exist. Using the “Community Map,” students will plant (draw) their eight trees where they feel the trees would be most beneficial. Have the students number their trees as they draw them and then describe their rationale below the map.
Your job as an urban and community forester is to plant (draw) 8 trees in this urban community. Think about where the best location may be for each tree. Number the trees you place on the community map and describe why you planted the tree in that particular location.

1. _________________________________________________________________
2. _________________________________________________________________
3. _________________________________________________________________
4. _________________________________________________________________
5. _________________________________________________________________
6. _________________________________________________________________
7. _________________________________________________________________
8. _________________________________________________________________

Student Name: ______________________________________________________
ACTIVITY C

Review what the students learned about trees in lesson 1. Tell the students that today they will explore many careers related to the study of trees. Cut apart the “Tree Jobs” cards and pass out one card to each of your students. The object of this activity is to have the students match up so that the job title is connected to the job description.

Teacher Key:

Arborist- Provides tree services to homeowners, commercial property owners, and cities and towns.

Forester- Cares for the land and sustains the long-term health of forests.

Park Planner- Plans all aspects of public park use.

Nursery Manager- Propagates, purchases, cares for, and sells potted trees, either wholesale or retail.

Tree Grower- Raises high-quality trees for wholesale and retail.

Urban & Community Forester- Cares for urban and community forest ecosystems within metropolitan and surrounding areas for the benefit of the residents.

Tree Trimmer- Provides tree care services to homes and businesses that promote optimal growth and correct problems with minimal damage.

Urban Planner- Coordinates and balances the complex relationships of a city. He/She understands the needs of a community and advises on the best way to pursue common goals.

Lumber Harvester- Turns logs into lumber.

GIS Technician- Uses Geographic Information Systems (GIS) to manage resources and plan land-use.

Research Scientist- Expert in research related to trees. Seeks ways to optimize the performance of trees by studying the effects of variable conditions on trees.

Community Project Manager- Works with communities to implement urban and community forestry grant programs.

Landscape Architect- Plans and designs private, public, and commercial greenspaces.

Utility Arborist- Manages trees near utility lines.

Wildland Fire Manager- Prevents, suppresses, contains, and controls damage and injuries from fires.
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<tr>
<th>Arborist</th>
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<th>Park Planner</th>
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<td>Tree Grower</td>
<td>Urban &amp; Community Forester</td>
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California Science Content Standards:

**Activity A**
Investigation & Experimentation 5.e. Collect data in an investigation and analyze those data to develop a logical conclusion.

6.a. Classify objects (e.g. rocks, plants, leaves) in accordance with appropriate criteria.

6.g. Record data by using appropriate graphic representations (including labeled diagrams) and make inferences based on those data.

**Activity B**
Investigation & Experimentation 6.b. Measure and estimate the weight, length, or volume of objects

5.c. Use numerical data in describing and comparing objects, events, and measurements.

Objectives:
- To understand how to use a key to identify a tree species.
- To understand how to properly measure a tree’s circumference and height.

ACTIVITY A

BACKGROUND FOR TEACHERS:

Ideally, this activity will work best outside on your school grounds. If that’s not possible, photos and samples will have to do. You’ll need information about several parts of the tree, so if you’re using photographs, take an up-close picture of a leaf, a branch, the bark, any flowers or fruits, and the tree as a whole. Bring a leaf and, if possible, a fruit or flower, to your classroom. If you can find a branch on the ground, bring that along, too.

Introduce the idea of a key chart to students. Explain that a key chart guides the user from a very broad category to a specific answer. Today, students will be using the Urban Tree Key. It uses the many different characteristics of trees to identify a specific tree. With each question, students will exclude many species, shrinking the list of possible matches with each step. At the final stage, students will be able to identify the trees in their schoolyard.

To complete this activity:

- Have students take a notepad or a copy of the following page, pencils, and crayons outside. Ask them to choose a tree in your schoolyard to identify.
- Have students take notes or draw pictures of the different attributes of the tree. See the next page for a list of attributes and questions to ask.
- Back in the classroom, have students log-on to: [www.urbantreekey.org](http://www.urbantreekey.org). Ask them to click the “Start Here” button on the left-hand side and then use their drawings, notes, and samples to answer the questions and identify their tree.

NOTE TO TEACHERS: Keep in mind that this 1st version of the Urban Tree Key only includes 45 species. On the streets of San Francisco alone, there are more than 200 species. If students get to the end without identifying their tree, have them go back over the questions to be sure they haven’t gone astray somewhere. If they still don’t have luck, check out the Resources page for more information and sources for identifying species. If your students come upon a species not included in the list, encourage them to send the species to the creators of the Urban Tree Key to ask them to include it in their next version.
Identifying a Tree

Leaves

Does the tree have broad flat leaves, scale-like evergreen leaves, needle-like evergreen leaves, or fronds (like a palm)?

Are the leaves or fronds are in bunches?

Do they alternate or are they opposite of each other?

Are there are smooth or have rough edges?

Do they have a specific shape?

Draw a picture of the leaves, needles, or fronds.

Bark

Is the bark peeling or coming off in shreds?

Does the bark have a more common ridged or furrowed appearance?

Take a rubbing of the bark and make notes.

Flowers or Fruit

Does the tree have flowers or fruit?

If it does, draw the flower or fruit.
**ACTIVITY B**

One of the ways we care for the urban forest is by measuring the growth of the trees within it. Tree growth information can be used to identify unusual growth patterns or if the balance between growth and failure is not good enough to sustain a forest ecosystem. In this activity, students will measure the tree’s trunk circumference and height.

**Trunk Circumference**

The circumference of the tree is to be measured at 4.5 feet above the ground on the uphill side of the tree. The best tool to use to measure circumference is a flexible tape measure or one can use a non-stretch string and a ruler. To ensure an accurate measurement make sure the tape or string is perpendicular to the axis of the trunk and is not twisted.

**Tree Height**

The total height of the tree is considered to be the distance between the base of the tree trunk and the topmost twig. The most reliable measuring tools are the Abney hand level, clinometer, or transit. If these tools are not available, one can measure the tree’s height with a straight stick.

1. Measure the distance from your eye to the joint of your thumb and index finger (arm is stretched out -- see photo 1).

2. Hold the stick straight up and down at arm’s length in front of you and make sure the portion above your hand is the same as what you measured from your eye to your hand (see photo 2).

3. Step backwards until the tree’s base appears to rest on the top of your fist, while the top of the stick appears to touch the top of the tree (see photo 3).

4. At this exact point, the height of the tree is equal to the distance from the base of the tree to you. Place a stake in the ground and measure (in feet) from the trunk of the tree to the stake to find the height! You can also stay were you are and have a friend measure the distance between the base of the tree and your feet.