JR TEACHER GUIDE: TREES

OCTOBER 2006

Dear Teachers,

In this guide we hope to offer you ways to incorporate *Greentimes JR: Trees* into your classroom. Your input directly affects our decisions of what to include in future guides, so please feel free to send feedback and suggestions to freemahe@bc.edu. Also, you can visit www.greenscreen.org for more information.

Happy Learning,
Heather Freeman
Greentimes Program Director

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Background Information

Deciduous trees are trees that lose their leaves before the cold or dry season. These trees often bear the fruit and nuts that we enjoy eating. They live in temperate climates where there is precipitation all year long. Some common types are oak, elm, and maple. Here is a link to a tree identification site for deciduous trees: http://www.ext.nodak.edu/extpubs/plantsci/trees/f436-1.htm. It has great, simple black and white images and descriptions.

Coniferous trees, or conifers, or evergreens are trees that can survive colder, drier climates than deciduous trees. Many, including firs, pines and spruces, have long skinny leaves called needles. Others, including cypress and cedars, have leaves that look like scales. Both types of leaves are more waxy than those of deciduous. Here is a site for conifer identification: http://www.cfl.scf.rncan.gc.ca/imfoc-idwcf/hosttrees/conifers/index_e.html#List

Photosynthesis is the process by which plants convert energy from sunlight into chemical energy that can be used by biological organisms. For young children, the chemical process may be quite complicated, but there are several key points they can learn at an early age:

- All our energy can be traced back to the sun (fossil fuels, food, etc).
- Plants are producers that "make" their own "food".
- Trees and other plants grow upward to reach toward the sun. This is why many forest floors are clear of small plants—the bigger trees block the light.

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Quick, Hands-On Science

Plants Drink Water Too:
Bring a few white daisies (other white flowers work too, but not quite as quickly) and red or blue food coloring. Put one daisy in a glass of water along with a few drops of red coloring and another in a glass of water with blue coloring. Check on the plant later that day and the next day until you see the petals start to change color!

(TIP: the fresher the flower, the better this will work.)

Art Activities

Real Leaf Posters
With a few simples supplies (construction paper, markers, glue) your students can make leaf posters. Have each student pick a leaf to glue in the middle of a piece of paper. Then have them list on the paper defining characteristics of the leaf. Is it pointy? Round? Small? Large? How many lobes does it have? This is a great, simple autumn project to take home for mom, dad, or grandparents to put on the fridge with a magnet! (TIP: for gluing leaves to paper, you will probably need liquid glue, not just a glue stick.)

Painted Leaf Prints
If you want to do a fun paint project with your students, pull out the paint and paper! Have your students collect leaves (preferably those that have already fallen but that are still pliable) outside. Apply a smooth, not-to-thick layer of paint to one side of the leaf (the back side usually picks up the veins better than the front side). Then gently press the leaf onto the white paper. This is a fun way to make cards, to decorate bulletin boards in the classroom, or to decorate paper book covers.

Spotlight: Importance of Urban Trees

Here are a few fascinating facts about urban trees:

- **Cut down on noise pollution:** Trees reduce noise pollution by acting as a buffer and absorbing urban noise.
- **Absorb storm water:** Storm water is an issue in urban areas because there is not enough open space to absorb rain and snowmelt. Trees also absorb storm water that might otherwise result in flash flooding. A city's urban forest can reduce peak storm runoff by 10 to 20 percent.
- **Keep the city cool in the summer and warmer in the winter:** Cities are “heat islands” that are 5-9 degrees hotter than surrounding areas. Trees help keep the city cool by shading hot streets and parking lots. Trees also release water through their leaves, actively cooling the air.
- **Save money:** During a 50-year life span, one tree will generate $30,000 worth of oxygen, recycle $35,000 worth of water, and clean up $60,000 worth of air pollution. That’s $125,000 total per tree!
- **Keep the city safe:** Apartment buildings that are surrounded by trees and greenery are safer than buildings without trees. The greener the surroundings, the fewer crimes occur against people and property.
- **Street Tree Inventory:** In the summer of 2006, Boston’s first street tree inventory was completed. How many street trees are there? 33,918! Counting parks, street trees and private land, a person looking out the window of an airplane would see 29% tree canopy in Boston.

These facts are provided courtesy of the Boston Urban Forest Coalition. Visit www.bostonforest.org for more information!

Writing & Reading Comprehension

Tree Poems
Your students can write a poem about a tree they know. Haikus are short poems that teach children about syllables and allow them to put simple thoughts down on paper. A haiku has 3 lines. The first line is 5 syllables, the second line is 7 syllables, and the third line is 5 syllables. Here is an example:

5 Roots deep down below
7 Branches spreading above
5 Safe, strong, soft shade

Another simple poetic form to use is alliteration. Can students find the repeating consonants in the poem above?

If your class writes tree poems, please email us so we can share them on our website! We'll be posting submissions from classes all fall and winter.

Vocabulary
There are a lot of new vocabulary words in the *Greentimes JR* articles. Most of them are in bold typeface. Some include: ecosystem, photosynthesis, chlorophyll, glucose, deciduous and coniferous. Here are a few ideas of ways to reinforce these new words.

- Hold an informal spelling bee after reading the articles.
- Ask students to choose a vocabulary word and use it in a sentence of their own.
- Have students write questions about trees using a vocabulary word, then answer the questions as a class.

Personal Tree Stories
Does your schoolyard have a tree or trees in it? Take a quick class trip outside to study the tree. When you return to the classroom, have students write down whatever it is that the tree makes them think of, or something they noticed about the tree. Make a list of all the students' thoughts—if you would like, have them name their tree. The goal of this activity is for the students to think about what the tree means to them, and why it is important. For a more elaborate project, have students write a paragraph about their tree and **submit it to us at www.greenscreen.org for possible publishing!**

Reading Suggestions

The Lorax, by Dr. Seuss
This classic children's book is not about real trees that grow on planet earth, but it is a wonderfully entertaining story that demonstrates our dependence on trees and the concept of balance in ecosystems.

The Seasons of Arnold's Apple Tree, by Gail Gibbons
This has great content on both trees and seasons—two lessons in one!

Maya and the Town that Loves a Tree, by Kiki and Kathryn Shaw
This book tells the story of a young girl who shows her community how to love a tree.

Tips on buying books… many people aren't aware that websites like www.amazon.com sell both new and USED books. This is a great way to save money when you're trying to enlarge your classroom library.

Out-of-School Time

After school, students want to have fun and relax. And many out-of-school-time programs want them to continue learning! UEI has developed a 10 week (~2 hours per week) OST curriculum for trees using *Greentimes JR*, science experiments, fun activities and games, and more resources, all in an easy-to-use packet designed especially for OST educators. If you are interested in receiving this packet, please contact us. (freemahe@bc.edu)

Worksheet Instructions, Framework Connections and Answer Key

Worksheet 1

This worksheet is about reinforcing science concepts and vocabulary found in the newsletter. The two activities could be completed as students read the newsletter or as a quiz afterwards. This could also be an easy take home assignment.

Answers:

True or False?	Fill in the Blank
1. True	1. photosynthesis, food
2. False (chlorophyll)	2. water, carbon dioxide, chlorophyll, sun
3. True	3. shelter
4. True	4. autumn
5. False (coniferous, or evergreen)	5. urban
6. True	6. needles

Worksheet 2

This worksheet offers students the opportunity to practice responding to short answer questions in a concise and grammatical fashion.

Answers:

Short Answer

1. Trees clean the air, store water, and serve as food and shelter.

2. Urban trees are important because they shade buildings (and reduce energy costs), they block the wind in the winter so it takes less energy to heat our homes, and they make communities better to look at and live in.

3. They stop making food because there is not enough sunlight for the trees to make chlorophyll.

4. Trees produce just enough glucose to survive the winter.

5. Coniferous trees have needles that stay green all year long and deciduous trees have leaves that change colors and fall off in the autumn.

6. Photo refers to light and synthesis means to combine separate parts into one.

Name: _____ **Date:** _____

GREENTIMES JR: TREES
Worksheet 1

True or False?

For each statement, write “true” or “false” in the blank provided.

1. Trees clean the air. _____
2. Carbon dioxide makes plants look green. _____
3. Glucose is a type of sugar. _____
4. Plants need energy from the sun. _____
5. Trees with needle-shaped leaves are called deciduous trees. _____
6. Evergreen trees are also called coniferous trees. _____

Fill in the Blank

Fill in each blank with the correct word from the word bank provided. Words may be used only once each. Not all the words will be used.

Word Bank

photosynthesis	**ecosystem**	**glucose**	**energy**	**needles**
water	**urban**	**chlorophyll**	**sun**	**autumn**
shelter	**food**	**carbon dioxide**	**leaves**	**green**

1. _____ is the process in which plants make their _____.
2. Plants need _____, _____, _____, and the _____ to make food.
3. Trees provide us with _____.
4. Trees lose their leaves in _____ to protect themselves during the winter.
5. _____ trees are just as important as trees in the forest.
6. _____ are one kind of leaf.

Name: _____ **Date:** _____

GREENTIMES JR: TREES
Worksheet 2

1. Why are trees an important component in ecosystems?

_____

_____

_____

2. Name three reasons why trees in urban areas are important?

_____

_____

_____

3. Why do trees stop making “food” in the autumn and winter?

_____

_____

_____

4. How do trees survive in the winter if they are not making food?

_____

_____

_____

5. How are the leaves of coniferous trees different than the leaves of deciduous trees?

_____

_____

_____

6. The word photosynthesis can be broken down into two parts, photo and synthesis. What do these two words mean?

_____

_____

_____