

Teacher's Guide for ODYSSEY:

April 2011: So Tall! Trees

Teacher's Guide prepared by: Lea M. Lorber Martin, B.A., English; M.Ed., Elementary Education. Lea has experience teaching fourth grade and is a freelance editor and writer in educational publishing.

Teachers: This Teacher's Guide is designed to be readily reproducible for student use. Please find an Answer Key at the end of the guide.

"Skywalking for Science: Aloft in Redwood Space," pages 6–13

1. What is a botanist?
2. True or False: Redwood trees can grow to be more than 300 feet tall.
3. How old are some of the oldest living coast redwoods?
4. What are the standard pieces of climbing equipment mentioned in "How to Climb a Giant"? How does climbing equipment keep climbers as well as trees safe?
5. According to the article, how are redwoods a key to slowing climate change?

"Bonsai: Tiny Trees on High Alert," pages 14–17

Mark the following statements true (T) or false (F). If false, provide the necessary correction.

1. ___ Bonsai is the art of cultivating tiny potted trees.
2. ___ Bonsai are specially bred miniatures of larger trees.
3. ___ Roots are necessary for support, water and nutrient absorption, and making food for the tree.
4. ___ Jasmonates may one day reduce chemical residues on the food we eat.

"Hamadryad at Midwinter," pages 22–23

- Identify words and phrases that help you visualize images in this piece of fiction, and describe how the words and phrases help you understand the writing.

"Gone Today, Here Tomorrow?" pages 24–27

1. Complete the timeline below:

1904—

1930s—

1950— chestnut blight had spread all over the eastern U.S., killing 4 billion trees

1970s—

1980—

1983—

Today— breeding program appears to be a success, but time will tell

2. Why do you think reforestation is important?

“Moon Trees (and Other Famous American Trees)” pages 28–31

1. Why is the oldest tree on Earth nicknamed *Methuselah*?
2. What is a Liberty Tree?
3. What is a path tree or signal tree?
4. What is a Moon Tree?
5. Where can you find the Survivor Tree?
6. Why are these trees important?

“Whole-Tree Architecture: Cutting the Forest to Save It,” pages 32–35

1. Complete the Cause-and-Effect Chart on clearcutting:

Cause	Effect
Rivers run through clearcut areas.	
Rain turns to muddy runoff.	
Soil nutrients are flushed out to sea.	
All the trees in an area are cut at the same time.	

2. Complete the Cause-and-Effect Chart on whole-tree culling:

Cause	Effect
The bark of standing cull trees is peeled.	
The wood is treated with a water-based sealer.	
The wood is coated with a boron-based solution.	
A home is built with whole trees.	

3. What do you think of when you look at the whole-tree house on pages 34–35? Would you like to live there? Why or why not?

“Christmas Tree Science,” pages 36–38

- Write a colorful description about a year in the life of a Christmas tree farmer.

“The Incredible Edible Tree,” pages 39–41

- Write a reaction to this article. What parts of a tree have you eaten or do you have in your cupboard? Did any edible tree items surprise you and how so? Describe what parts you enjoy most and why, or discuss the parts you would now like to try and why after having read this article.

“Staying Healthy: It’s a Science! Get Some Ds,” pages 42–43

1. Why is vitamin D important?
2. Fill in the two-column chart to list ways to get your vitamin D.

Food Sources Containing Vitamin D	Other Sources of Vitamin D

3. How do you get your vitamin D?

ANSWER KEY:

"Skywalking for Science: Aloft in Redwood Space"

1. a scientist who studies plants
2. True
3. 2,000 years
4. Hardhats, harnesses, and climbing rope. Possible response: Hardhats may protect climbers' heads from injury from falling branches. Harnesses and ropes protect the tree by reducing the weight climbers put on branches, allowing climbers to explore the farthest tips of branches.
5. Redwoods are "champions" at capturing and storing carbon dioxide from the atmosphere, the overabundance of which is causing climate change.

"Bonsai: Tiny Trees on High Alert"

1. (T)
2. (F) Bonsai are genetically full-sized species.
3. (F) Roots are necessary for support, water and nutrient absorption, and for the storage of reserve energy.
4. (T)

"Hamadryad at Midwinter"

Possible response:

The words "crackled with dry cold" sends a shiver down my spine. It helps me visualize the forest in winter because I can hear it and feel it. The phrase "The firs and pines wore white on their darkness" helps me visualize the backdrop. The trees are "wearing" coats of white. I can see snow-covered pines, with limbs sagging under the weight of the snow. The imagery helps me understand the severity of the cold that the hamadryad *Acerea* is enduring because I can see it and feel it.

"Gone Today, Here Tomorrow?"

Possible response:

1.
1904— fungus deadly to American chestnut trees is first detected
1930s— cross-breeding of American and Chinese chestnut trees begins
1950— chestnut blight had spread all over the eastern U.S., killing 4 billion trees
1970s— breeding effort was abandoned
1980— new strategy for breeding arises
1983— group forms to promote "the redwood of the east"
Today— breeding program appears to be a success, but time will tell
2. Responses will vary but may include thoughts about the importance of preserving all species of living things or about slowing climate change through the help of trees.

"Moon Trees (and Other Famous American Trees)"

Possible responses:

1. *Methuselah* is a biblical patriarch said to have lived 969 years. The oldest tree is nicknamed *Methuselah* because it has been around for so long.
2. A Liberty Tree is a tree that represents the elm that served as a rallying point for colonists resistant to British rule.
3. A path tree or signal tree was bent as a sapling so that its trunk would grow horizontally to mark trails or good hunting spots.
4. A Moon Tree is one of some 400 seeds that orbited the Moon and was later planted at a national landmark.
5. The Survivor Tree stands in the Oklahoma City National Memorial & Museum.
6. These trees are important because they preserve American culture and history.

“Whole-Tree Architecture: Cutting the Forest to Save It”

Possible response:

1.

Cause	Effect
Rivers run through clearcut areas.	Without shade, water warms, which may be too warm for fish to survive.
Rain turns to muddy runoff.	Nutrient-rich topsoil runs downstream.
Soil nutrients are flushed out to sea.	Nutrients harm aquatic life.
All the trees in an area are cut at the same time.	Other ecosystems are put at risk.

Possible response:

2.

Cause	Effect
The bark of standing cull trees is peeled.	Nutrients in bark enrich forest soil.
The peeled wood is treated with a water-based sealer.	The wood will not dry and crack.
The peeled wood is coated with a boron-based solution.	The wood is protected from mold and bugs.
A home is built with whole trees.	No chemical by-products, off-gassing, or other health risks are produced.

3. Responses will vary but may include comments about the house reminding students of camping, log cabins, nature. Responses should include reasons as to why students would or would not like to live in a whole-tree house.

“Christmas Tree Science”

Responses will vary but should include specific tasks from each season. Specific tasks may include:

Spring: Farmers plant at least one tree for each one that was cut the previous Christmas.

Summer: Farmers regularly examine trees for pests and regularly shape branches.

Fall: Farmers cut trees that will be shipped elsewhere and prepare for cut-your-own customers.

Winter: Farmers clean up farmland, getting rid of brush and stumps, before any heavy snowfall.

“The Incredible Edible Tree!”

Responses will vary but should include details about what students have seen or eaten before, what items surprised them, what they like to eat most and why, or what they are interested in trying. Students may be interested in eating other kinds of leaves if they like Thai food, for example, or they may be surprised about the dried flower buds in their pumpkin pie.

“Staying Healthy: It’s a Science! Get Some Ds”

Possible responses:

1. Vitamin D supports bone development, helps prevent rickets, and may help to prevent some cancers.

2.

Food Sources Containing Vitamin D	Other Sources of Vitamin D
Sockeye salmon	Sunshine on your skin
Fish liver oil	Vitamin D ₃ tablets

Milk	
Catfish	
Eggs	

3. Responses may vary but should include sources listed in the chart, such as drinking milk or playing in the Sun, responsibly!