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**HARVARD FOREST**

HARVARD UNIVERSITY

Established 1907 Long Term Ecological Research Site since 1988



## Harvard LTER Schoolyard Program

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**Teacher Developed Lessons and Documents that integrate  
Harvard Forest Schoolyard Ecology Themes into curriculum.**

- **Presentation Title:** Approaching Walden Lesson Plans
- **Teacher/Author:** Maria Blewitt
- **School:** Austin Preparatory School
- **Level:** Grade 7 Life Science
- **Date:** April 13, 2011

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|-------------------------|--|
| <b>Title of Lesson</b>  | <b>Do We See Evidence of Climate Change?</b> |
| <b>Duration of Unit</b> | 2 class periods                              |
| <b>Subject</b>          | Grade 7 Life Science                         |
| <b>Related Subjects</b> | Grade 7 Reading                              |
| <b>Date</b>             | August, 2010                                 |

**Abstract:** In his essay *Autumnal Tints*, Henry David Thoreau records dates of peak autumn color for the time he lived. Students will compare their fall tree phenology study to his dates to see if they see evidence of climate change.

**Goals/Objectives:** The goal of this lesson is to have students understand that scientific claims are built on evidence.

**Materials:**

Thoreau, H.D. (1862). *Autumnal Tints*. Reprinted by Applewood Books. Bedford, MA.

Student worksheets on following pages, including embedded website.

**Procedure:**

1. Have students read the article from Science News for Kids on Global Climate Change, and complete the worksheet. Science News for Kids is an internet resource provided by the Society for Science and the Public, which also publishes the journal Science News.
2. Later in the fall, after observing when their tree reaches peak foliage color, have the students do the second worksheet and relate their trees to global climate change.

# Why Should We Study the Effects of Climate Change on Fall Leaves



Go to <http://www.sciencenewsforkids.org/articles/20090415/Feature1.asp>.

Please read the article online and answer the following questions:

1. What are some ways that scientists have studied that show that spring is starting earlier than ever before?
2. What is causing the spring to start earlier?
3. Why does it make a difference when spring is?
4. Why does it take a long time to study climate change?
5. Abe Miller-Rushing and Richard Primack are two scientists who study the effects of climate change on plants. Where did they go to get information about seasonal dates in the Boston area from a long time ago?
6. After these scientists studied old information, what did they do to gather information about the seasons in Boston right now?
7. What did they find about the blooming time of flowers?
8. Why could an earlier bloom time hurt the Boston ecosystems – not just the plants that bloom earlier, but the animals in the area?
9. How did Christine Rogers find that climate change could affect kids with allergies?
10. What do you think a citizen scientist is?
11. What is phenology?
12. What is the National Phenology network? BTW, Harvard forest has one of the lilacs that has been planted around the country to track changes in bloom time.
13. Can you guess who is going to be a citizen scientist working on fall phenology this autumn?
14. Use the power words section to define climate change.
15. Thinking about this article, how do you think climate change could affect the changing colors and falling off of the leaves on the trees on Austin's campus?

Name:

Block:

Date:

## **Do We See Evidence for Climate Change in our Trees? 18 points**



Do you remember reading about Dr. Primack and Dr. Miller-Rushing? They used Henry David Thoreau's journals to determine when flowers bloomed in spring during the Thoreau's time (1850's – 1860's). Then, they compared Thoreau's bloom times with bloom times in 2004-2006, and showed that flowers were blooming earlier in the year due to climate change.

In 1862, Thoreau wrote an article for a magazine. The title of the article was *Autumnal Tints*, and Thoreau recorded his observations on when trees reached peak color in the fall. We can do the same kind of research as Drs. Primack and Miller-Rushing, and compare when Thoreau said peak color was in 1862, and when we see peak colors now.

1. Gather up your data sheets for your tree. Find when your tree reached peak fall color – when 100% of the leaves had changed color. Write down that date here. 2 points

Date: \_\_\_\_\_

2. Now let's compare to when Thoreau said the trees were at peak color. As a class, we will record all of the dates for our trees, and fill in this entire chart. 2 points

| Tree  | Thoreau Peak Fall Color Data - 1862 | Austin Peak Fall Color Data - 2010 |
|---|-------------------------------------|------------------------------------|
| Red Maple                                   | Sept. 25                            |                                    |
| Sugar Maple                                 | Oct. 2                              |                                    |
| Scarlet Oak – Thoreau<br>Black Oak – Austin | Oct. 26                             |                                    |
| Quaking Aspen                               | Oct. 26                             |                                    |

3. On the back of this paper, graph Thoreau's dates with Austin's dates. 10 points

4. In the space below, using your graph, write a comparison about the similarities and differences between Thoreau and Austin. 2 points

5. Does there appear to be any evidence that global climate change is affecting our fall foliage? Support your answer with evidence. 2 points

Your graph should include

A good long science title – 2 points

X and Y axis labels – 2 points

Key to indicate which are Thoreau's results, and which are Austin's results – 2 points

Bars drawn to the correct height – 2 points

Neatness and accuracy – 2 points

TOTAL = 10 points

**Title:**

