

Harvard LTER Schoolyard Program

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



- Lesson Title: *Outline of Introductory Lessons for HF Schoolyard Ecology Buds, Leaves and Global Warming*

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- School: Overlook Middle School
- Level: Middle School-Grade 7

**Introductory Lessons for
Harvard Forest Schoolyard Ecology
Buds, Leaves and Global Warming**

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The following is a list of activities I do with my seventh graders to get them ready for the Buds, Leaves and Global Warming fall protocol. They are listed in the order we do them. At the end of each activity, there is a bulleted list of any corresponding worksheets or packets to go along with that activity. They are all included in this folder. If you would like an electronic copy of anything, please email me at the above address and I would be glad to send it to you. Enjoy!

First Session

Activity 1. Brainstorm what the students (think they) know about fall, leaves changing color, falling off of the trees and coming out again in the spring. Save these overheads or poster papers to look at misconceptions later on as they are important to correct. Pass out the True/False “quiz.” Have them answer the questions then go over it together. Save for later to take care of misconceptions.

- True/False Quiz

Activity 2. Read the article “Why Leaves Change their Color” from the U.S. Dept. of Agriculture. While reading, take notes on the graphic organizer.

- 4 page article titled “Why Leaves Change their Color”
- 2 page graphic organizer titled Why Leaves Change Color/
- a key of important details is provided for the graphic organizer

Second-Third Sessions

Depending on how much time you can spend on each session, you might have to finish Activity 2 above during this session.

Activity 3. Once Activity 2 is complete, review brainstormed list and T/F activity from the first session and correct any misconceptions.

Activity 4. Pass out the student packet and explain the Buds, Leaves and Global Warming project we will be taking part in this fall. At this time I review the steps of the **Scientific Method** in terms of Dr. O’Keefe’s study. His **questions**, or basis of the study, are listed on the top of the note packet. We discuss possible **hypotheses** and how he has set up the **experiment**. Our responsibility is assisting with **data** collection. If possible, have students look at the website listed on the top of the page and let them take a look around the site. Let them look at the different schools participating and what the data looks like. Discuss how the **conclusions** will take years and why it will take so long.

Start the vocabulary. Do a little bit of the packet each day so it doesn’t seem overwhelming.

- 3 page student packet with “vocabulary” and “important questions to answer”
- copies of complete notes

Activity 5. To get students “thinking like scientists” I have them bring in a seed pod. (Autumn is a great time to get some very interesting seed pods.) In their science journals, students look at, sketch and write about shape, texture and think about how it grows on the plant and how it will germinate.

In addition to this activity, students can observe various coniferous and deciduous branches. In their science journals they document observations in both words and sketches. Have them write questions about their branch. If time, they should share with the whole class so everyone can hear what others are thinking. (This gets them observing and thinking like scientists. The only question they can’t ask is “What kind of tree is it?” The emphasis should be on structures, colors, smells, textures, etc. and not solely on identification.)

Also, tie these branches with blue flagging marking where to start counting the leaves (just like you will have on the study trees outside.) Have students practice figuring out which will be “leaf 1, 2,” etc. Practicing inside saves a lot of time outside!

- “A Seedy Character”
- “Be a Leaf Peeper”
- Lab Group Rubric

Fourth Session

Continue with student vocab. and question packet.

Activity 6. On the overhead, show them how to measure in cm the length and width of different types of leaves. They will practice measuring pictures of leaves on the “A Key to Trees” worksheet, as well as identify the different trees on the page.

- “A Key to Trees” 1990 Instructional Fair, Inc.

Activity 7. Prior to this activity you have taped six different types of leaves to the tables at each lab station. Pass out the actual data collection sheets students will be using outdoors. Have them measure the lengths and widths of the different types of leaves and record their data. They will also estimate the % color change of each leaf. They will leave their data sheet at the station so all classes can compare their data and see if they are getting similar answers. If anyone is way off, it is easier to catch the measuring problem indoors than outdoors.

- Autumn Student Data Sheet
- Collection of fall data master

Fifth Session

Continue with student vocab. and question packet.

Activity 8. Pass out and have students look at the “Outdoor Classroom Rubric” as you discuss your expectations in the “outdoor classroom.” At the end of each outdoor session, leave time for students to score themselves on the rubric first. You will score them later and if your scores and theirs are really off, you will have a discussion with them. Practice using the rubric and their outdoor skills while participating in the “Un-Nature Walk.”

- Outdoor Classroom Rubric
- “Un-Nature Walk: Observation Skills Upgrade” from “Let Nature be the Teacher” by Joann Blum.

Sixth Session

Activity 9. Pass out “Outdoor Classroom Rubric” and clipboards. Have students bring their vocab. and question packet and head outside to “meet their trees.” Start with question 5 on page 2 and answer the questions through page 3. On page 3 they sketch their branch and number the leaves. (This sketch was extremely useful in helping them ID the different

leaves #1-6 since the protocol has changed and we don't # individual leaves!! It should also help ID the correct buds in the spring.)

From here, start the fall observations on the "Autumn Data Collection Sheets."

Later on...Graphing

Set out copies of any years of data you have. Have students fill in a data table of Leaf Fall and Bud Burst so they can calculate the growing season of their trees. See suggested graphing activities.

- Harvard Forest Study Graphing and Analysis
- Graph and Analysis Rubric Checklist