Trees, Trees…Everywhere?
An Inventory of Trees on Your School Site

Eco-Standards Check Activity

Essential Question: *How many trees occur on the site and how large are they?*

Location: Checkpoints outdoors

Objectives: *Learners will*
1) count the number of hardwood and softwood trees.
2) measure the circumference of the 3 largest trees.
3) identify the largest tree (by species or common name).

Skills: data collection, observation, communication

Supplies:
- yardstick or meter stick
- tape measure
- clipboards
- pencils
- pieces of yarn or string
- GEN tree cards
- tree guide
- calculator
- Standards Checks data sheet
- Standards Checks map

Subjects: Science, math

Time: 30 minutes or more (depends upon the number of trees)

At a Glance:
Learners will survey the trees on the school site and measure their diameter. This data will be compared from year to year to determine if growth has occurred.

Background Information:
Humans can only live a few minutes without air, yet it is one of the resources that we rarely think about until it is polluted and poses a danger to our health. We are fortunate that nature provides us with a good filtering system that takes the dust and poisonous gases out of our air, and releases clean air filled with oxygen, the gas we need to breathe. This filtering system is made of plants, especially trees. In many urban ecosystems trees are losing ground to lawns and asphalt. How is your GEN club site doing? The Air Department Standard Checks help the children think about the connection between green plants and clean air and evaluate the condition of our ecosystems.

Foresters classify trees into two types, hardwoods and softwoods. Softwoods are species that have wood that is less dense and grow faster. They produce cones instead of flowers. Examples of softwoods are pines, spruce, fir, cedar, yew, and cypress. Hardwoods are denser and grow more slowly. They are broad-leaved species, such as oak, pecan, elm, birch, dogwood, redbud, hickory, magnolia, and maple. Lots of trees means cleaner air, and different species of trees may provide more efficient air filtering. The amount of air purification that occurs at your school site will depend not only on the number of trees growing there, but also on the size of the trees. Large trees have many leaves and will be taking in large quantities of air. Measuring the circumference of a tree (how big it is around) is a good way to measure the size of a tree.

Getting Ready:
Learners will work within a certain distance from Checkpoints. Check the area for hazards, such as poison ivy plants. (Remember that poison ivy has a fuzzy-looking stem that can grow up the trunk of trees.) Assemble the required sets of data collection materials beforehand.

Procedure: Part A:
1. Review the tree classification with the learners. Use the GEN tree cards to sort softwoods (pines, etc) from hardwoods.
2. Split learners into three teams. Each group should have a data sheet, clipboard, tape measure, meter stick and yarn.
3. Demonstrate the technique for measuring dbh (as follows):

- In the scientific literature, tree size is usually estimated by measuring the dbh, which stands for diameter at breast height. In this exercise, learners will measure the circumference of the tree at breast height. (Circumference and diameter are related by the formula, circumference = 3.142 x diameter.) Generally, it is assumed that an adult will take the dbh measurement, and it will be approximately 4.5 feet from the ground surface. Because children will be collecting this data for the standards check, we need to specify the height of the tree at which this measurement will be taken. Take the circumference measurement at **one meter** above the ground surface using a meter stick.
- At one meter from the ground surface, wrap the tape measure around the trunk. Be sure there are no branches in the way and that the tape measure lies flat against the bark. In addition, be sure the tape is parallel to the ground and not held at an angle.
- Read the measurement of the size of the tree trunk in inches or centimeters.

4. Assign a Checkpoint area to each group. Emphasize that they should only count and measure a tree once.
5. Measure distances of the trees from Checkpoints by counting strides or using tape measures. (One adult stride is approximately 2.5 feet. The stride length of a child will vary based on age/size of the child. To determine a more definite stride length, count strides within a known distance three times and then divide by three to get the average.)
6. Use a tree identification guide to identify the trees. Make brief notes about the conditions of the trees (healthy, not so healthy).
7. Record measurements on data sheets. Data sheets will be stored in GEN Club Log Book for comparison in later years.
8. Divide circumference by 3.14 to get the diameter of each tree.
9. Map the trees on a Standards Checks Map.

Part B: Earth's Majestic Tree Cleaners! Tree Walk

1. Choose a loop to walk on your school site and walk the same way each time you do this standards' check.
2. Orient the learners to the 'Earth's Majestic Tree Cleaners! Tree Walk' data sheet. Learners may remain in same groups from Part A's activity.
3. As the group is led on the tour of the school site, they are to note the type of trees that are seen. Write the type of tree on the data sheet, then place a tally mark (/) next to each tree as it is seen on the site.
4. At the end of the tour, add up the total number of tally marks for each tree type.

Discussion/Assessment:

Discuss the trees that were measured. Do they have both hardwoods and softwoods?
Does the site have many different kinds of trees?
How large are the trees?
Where are the biggest trees found?
Let the children think about what was on the site before the school was built. Were trees left that now are large and excellent air filters?
How can the GEN club help the Air Department work more efficiently on their site?
Explore some of the largest trees near your school site. Who knows what history you may discover? One tree in Athens, GA was willed its own piece of land and therefore owns itself.

Connections
The largest trees in the U.S. can be explored by visiting the National Register of Champion Trees website: **http://www.americanforests.org/resources/bigtrees/register.php**
Download the register of Georgia's champion trees at:
http://www.gfc.state.ga.us/ForestManagement/ChampionTree.cfm

TREES, TREES…EVERYWHERE

Team Members_____**Date**_____

Checkpoint # or Name _____

Weather Conditions_____

Temperature _____ **Humidity** _____

INSTRUCTIONS: Choose 4 trees near the checkpoint and collect the following information about each. If there are no trees near your checkpoint, select alternate trees on your site.

Time: 20 minutes

Tree Location *(distance in paces and direction N S E or W from Checkpoint)*	**Circumference** *(cm)*	**Dbh** *(cm)*	**Common Name** *(Genus species if possible)*	**Condition** *(excellent, good, fair, poor)*
Tree #1				
Tree #2				
Tree #3				
Tree #4				

Earth's Majestic Tree Cleaners! Tree Walk

Team Members _____Date _____Time _____

NOTE: For this activity choose a loop to walk on your school site and walk the same way each time you do this standards check.

Location: _____

Weather Conditions:_____

INSTRUCTIONS: Place a check (/) next to each tree you see on your site. At the end of your tour, add up the total number of each organism you saw.

Common Name of Tree (add genus species if known)	**Hardwood or Softwood?**	**This many times. . .**	**Total**