Introduction

Did you know that researchers go on expeditions all around the world to collect samples of plants, including trees? Why do you think this is important? Well, scientists explore the world around them in order to document and record what surrounds us. It is important to study and learn about our surroundings because, as living things, we all exist together and we all play a role in what is best described as “the circle of life.”

In the “Tree of Trees” lesson, we introduced the importance of naming and how similar things are grouped together and organized into a hierarchy. We now challenge you to combine this knowledge and take part in an expedition or an inventory of your surroundings. This lesson uses tree species located throughout the Smithsonian Gardens to highlight how scientists take part in an expedition. These expeditions begin with a mission to explore and collect specimens from an area.

The scientists at the Smithsonian that collect plant samples are called Botanists, and once they take some leaf, flower, fruit, and/or wood samples they dry them, and then store them as part of a collection. This collection of dried plant material is called a herbarium and scientists study the specimens to understand plant forms and the relationships among plant groups. Today scientists are using these types of collections to learn about changes in flowering times based on multiple collections from the same location over 100 years of time. What other types of collections can you think of?

The Smithsonian Herbarium houses around 4.8 million dried plants. This collection includes plant specimens from expeditions like the United States Exploring Expedition from 1838-1842, which means some of the plant specimens are over 150 years old! The picture to the right is a specimen from the Smithsonian herbarium of an American elm (Ulmus americana) that was collected on the grounds of the Smithsonian mall.

With that we want to introduce you to the world of tree expeditions and encourage you to take a stroll through your own community to find out what’s there! You never know what you might come across until you start looking. Now get outside and take note of the trees that surround you!
Learning Goals:
- Get students to develop their observation skills
- Introduce the concepts of collections and continue learning about how we group things together
- Introduce the scientific method and scientific inquiry

What you'll need for your expedition:
- Notebook
- Activity sheet and/or notebook
- Colored pencils

Back in the classroom:
- Heavy paper, glue, and wax paper

Useful sources:
- DC Flora Kids page
  http://botany.si.edu/DCflora/kidspage/index2.htm

Plant key of your area, examples:
Activity:

1. In the classroom or at home: Have a group discussion on what is a collection- keep this general and not about a specific type of collection. Ask students what they think a collection is and record their suggestions on the board. Encourage them to think about what was discussed and learned from Lesson 1, regarding names.

   Activity Part I:
   - Bring in magazines and have students cut out images that they can group together to make a collection. Use the activity sheet labeled “Your Collection” for students to glue their images together as a collage and answer the questions on the sheet. Have them present their collection to the class.
   - Ask students if they collect anything? If so, have students bring in pictures of their collection and ask them to share how long they have had their collection and what characters they look for in adding new object to their collection. If they do not collect anything, ask them what they would collect and why?

2. Explain in more depth about plant collecting and review the following terms from the Smithsonian Botany Department, on the DC Flora Kids page, to discuss why collecting is important. http://botany.si.edu/DCflora/kidspage/collection.htm
   - Observe, collect, record/identity, preserve
   - Observe – have students take note of what surrounds them
   - Collect – Only collect what you need and what will benefit your collection
   - Record/Identify – Take notes about the collection and identify trees using a key
   - Preserve – Learn about how the specimens are kept in collections for the future
     *This website also includes an excellent video on how scientists preserve plant specimens, like the example of the herbarium sheet on the introduction page, for the future.

3. On your Smithsonian Gardens Expedition walk: Complete activity sheet II titled “Smithsonian Garden Expedition.” *If you cannot make it to the Smithsonian Gardens, then review the activity and skip to #4.
   - Do a scavenger hunt, using the hints about locations, and find the trees based on the descriptions provided
   - Once you have located the tree, complete the “plant collecting label” activity which allows students to record notes about the surroundings and anything else about the tree, including flowers or fruits
     Note: *It is important not to collect the leaves on the grounds of the Smithsonian Gardens or local public parks because if everyone did then the trees might lose all their leaves!
Activity:

4. Back in your classroom or at home:
   Activity Part III:
   - Take a walk of your schoolyard or nearby park and count the trees in the area. Pick a leaf from each tree, or have students bring a leaf from home. Have students break into groups and be responsible for tracing the leaves. This exercise shows the students the next phase of an expedition. Refer back to the steps of an expedition: observe, collect, record/identify, and preserve. This is the preserve step in action. Prepare some of the leaves as explained from the DC Flora Kids page, by gluing them to paper and attaching plant collecting label. Review all the leaves and ask them to point out the different characters.
   - Now use the pictures from the Smithsonian walk to compare with the trees from your local neighborhood. Are any the same?
   - Combine all tree leaf pictures from your expedition and make a book that you can keep. Explain that this is similar to how we keep specimens or preserve them for future research. Make the connection between this class collection being preserved like specimens being preserved in the Smithsonian herbarium.

Other ideas:
For younger students: Have the younger students color different leaf shapes and discuss that there are many types of leaves that are found on trees. Read a book from your library about forests, trees, etc

For older students: You could have them prepare the specimens as mentioned through the DC Flora Kids Page in order to make their own small tree leaf collection. Have them find 10 different trees for their collection and prepare an inventory of what they found.
Activity Part I

Your Collection

-What characteristics of these objects make this a collection, or how are these objects similar?
Try to locate the trees below based on what you see in the pictures and the hints along with each one. As you walk around the grounds, take note of how many trees you see.

This tree can be found near a museum that houses airplanes. It is a *Picea pungens*, or commonly called a blue spruce.

**Picea pungens**
- Date: ____________
- Location: __________________________
- Habitat: ____________________________
- Plant descriptions (flowers/fruit): ____________________________

This tree can be found near a museum that highlights the life of American Indians. It has interesting bark and likes moist soil. It is commonly called an American sycamore.

**Platanus occidentalis**
- Date: ____________
- Location: __________________________
- Habitat: ____________________________
- Plant descriptions (flowers/fruit): ____________________________
This tree is found near a garden feature called a “moongate.” It is near a building that houses an exhibit called the “Peacock Room.” Common name = Weeping beech

This tree is found in a place where butterflies love to roam. It has three different types of leaves and is commonly called Sassafras.

<table>
<thead>
<tr>
<th>Plant</th>
<th>Date: ___________</th>
<th>Location: __________________________________________</th>
<th>Habitat: __________________________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Fagus sylvatica</em></td>
<td></td>
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<td></td>
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<tr>
<td><em>Sassafras albidum</em></td>
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</tr>
</tbody>
</table>
Activity III: In your school yard, local park or from home:

- Count the trees in the area: ________________________________
- Pick a leaf from each tree, or bring a leaf from home
- Prepare some of the leaves as explained from the DC Flora Kids page, by gluing them to paper and attaching plant collecting label. Review all the leaves and discuss the different characters.

Trace your leaf here

Glue your leaf here

Name: _________________________  Date: ______________
Location: _______________________________________
Habitat: _________________________________________
Plant descriptions (flowers/fruits):____________________

ENGLISH BLUEBELL

PEONY