A METER SQUARE BIODIVERSITY PLOT
Species in a Meter Square

Materials:
- 4 Flags per plot
- Meter sticks
- Rulers
- String
- Clip boards
- Hand lenses
- Field guides
- Pencil/ Pens (optional: colored pencils)
- Data sheets
- Graph paper/poster board

Procedure:
In preparation for this activity, take some time to locate two areas in the schoolyard that differ in several aspects. For example, one site could be an area that receives full sunlight and the other is in perpetual shade. Another option would be to use the school garden as one area and the school lawn for the second. Both areas should have some amount of plant diversity, but must differ in environmental conditions. Be creative in your site selection, but don’t explain why you chose the areas to the students.

1. Explain to the students what biodiversity is and how scientists use it to determine ecosystem fitness/hot spots for conservation
2. Break students into groups and allow them to complete the background information worksheet.
3. Collect the worksheets and pass out the activity sheets to each student group.
4. Take the students outside and show them the two (or more) areas they will be measuring. Each group will need a set of data sheets for each area.
5. Give them equal time to observe and measure both areas and ample time for class comparison and discussion. Encourage students to use hand lenses to observe fine details.
6. After collecting data in at least two areas, compile the data into a graph (either in groups or as a class), and use the graph to identify patterns and differences. The y axis should include the number of individuals, while the x axis would list the species. Use the questions on the worksheets as a guide.
7. Redistribute the completed background worksheets to each student and ask them if they would change their answers at all after having completed the activity.
A METER SQUARE BIODIVERSITY PLOT
Building Background Knowledge

Name:             Date:

Work in small groups and share your thoughts on how you might use a meter square sample plot to study the biodiversity of an area. Record some of those ideas here. You will use this worksheet again, writing down more thoughts, after the outdoor activity.

List different habitats you might find near your school or in your neighborhood.

What sorts of plants and animals would you expect to find in those habitats?

What would be an indicator of a healthy habitat?

What types of questions could you answer by measuring a small sampling area, say 1 meter by 1 meter square?

What types of questions you might try to answer using a large sampling area, say 100 meters by 100 meters square (or bigger)?
A METER SQUARE BIODIVERSITY PLOT
Species in a Meter Square Activity

Step 1: Write out your research statement, what are you comparing?

Example: “We will compare plant species found in a forested area with those found in a sunny grassy area near the PE field.”

Step 2: Using a meter stick and flags (or other measuring tool), mark your sampling area.

Step 3: Describe and draw on your data sheet a picture of each plant/animal species you see in the sampling square.

Step 4: Count the number of individuals of each species and record those numbers on your data sheet.

Step 5: Make a graph of species found and determine which species was the most common and which species was the least common.

Step 6: Compare your study plot to that of other groups and discuss the following questions:

1. What plot had the most number of total species?
2. What plot had the greatest number of total individuals?
3. Did you see any animals? What were they doing?
4. Why were some areas more diverse than others?
5. Explain some problems scientists face when they try to count entire populations. What methods can they use to deal with some of these problems? Do they need exact numbers of all populations?
A METER SQUARE BIODIVERSITY PLOT
Plant Data Sheet

Name:             Date:

Description of sample site (i.e., weather, temperature, soil type):

<table>
<thead>
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<th>Description of plant/animal</th>
<th>Drawing of plant/animal</th>
<th>Number of individuals</th>
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A METER SQUARE BIODIVERSITY PLOT
Adapting the Lesson

Materials
If you are having difficulty finding materials to mark the plots, try using classroom items. A flag can be replaced with a pencil, the meter tape can be used to mark several lengths on a stick or string and students can use that as a reference. You may also want to distribute rulers, magnifying glasses or hand lenses, and cameras for students to use during their investigations. Field guides are wonderful tools students can use to identify the exact plant or animal species they observed in their sample area. Using field guides during and after the activity can give scientific names and information on each species, encouraging further investigation.

Suggested field guides:
Everglades Wildflowers: A Field Guide to Wildflowers of the Historic Everglades, Including Big Cypress, Corkscrew, and Fakahatchee Swamps by Roger L. Hammer
Florida Wild Flowers and Roadside Plants by C. Ritchie Bell and Bryan J. Taylor
The Trees of Florida: A Reference and Field Guide by Gil Nelson

Younger Students
Measuring out plots may be difficult for younger students and areas can be defined instead by using hula hoops, frames or boxes with the bottom and top cut out. Each group can focus on one area and compare results with a group who measured a different area to save time. During the graphing portion of the activity, bring the class together to discuss results and address any misconceptions the students may have about habitats and biodiversity.

Older Students
Emphasize the importance of documentation during scientific inquiry and dissemination of the results with other members of the scientific community. Have students write group or individual reports which outline the observations made, explain the similarities and differences in data and suggest ideas for future research to answer additional questions. Citizen science activities are a great way to connect student observations with global research initiatives. Use the links provided on the resource guide to start a citizen science project with your students. Biodiversity measures such as species richness and the Simpson’s Index are good tools to use when explaining how scientists apply collected data to large areas.

Extension Activity
As an extension, you can go deeper into the aspects of human influence on biodiversity, and the responsibilities citizens have to their environment. The following questions can be used to start the discussion:

1. What happens when new plants are introduced to a habitat? Do they have a negative impact on the native plants growing there? Give examples to support your ideas.
2. Discuss environmental stresses that could affect your habitat of study. What would happen if a hurricane or tornado struck your study area? Do you think your plant habitat could survive such natural disasters? Should humans take measures to ensure biodiversity?
3. Discuss whether the United States should be involved in controlling plant diversity in other countries.