

RESOURCE LIBRARY
ACTIVITY : 1 HR

Plot Study Observations

Students conduct a plot study to observe and record the presence of all living organisms in a selected area.

GRADES

6 - 12+

SUBJECTS

Biology, Geography, Physical Geography

CONTENTS

2 PDFs

OVERVIEW

Students conduct a plot study to observe and record the presence of all living organisms in a selected area.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/plot-study-observations/>

Program

bioblitz

DIRECTIONS

1. Show students the presentation **Making and Recording Observations**.

Use the Powerpoint presentation to introduce students to the importance of observations—both in daily life and in scientific research. As a class, discuss differences in powers of

observation among species; differences between scientific and casual observations; factors that impact human observations; and techniques scientists use to record observations.

2. Review best practices.

Explain to students that they will conduct a plot study to observe and record the presence of all living organisms—plant and animal—in their selected area. Review best practices for scientific observation and recording; for example, remind students:

- there are different ways to record data, including written descriptions, photographs, and sketches
- different factors—such as location, time, tools, knowledge, or perception—impact human observation

3. Distribute the worksheet and brainstorm.

Distribute the worksheet Plot Study Datasheet and ask the class to brainstorm the characteristics they think are important to observe and record for each organism observed; for example, size, color, and markings.

4. Label the datasheet.

Have students label rows in the first column of the datasheet with the characteristics they have determined to be important.

5. Divide the class into small groups and distribute additional materials.

Make sure each group has a length of rope or hula hoop, a clipboard, and copies of Plot Study Datasheet.

6. Have students go to the research area and complete the plot study.

If necessary, show students how to mark off a bounded area. Provide additional support, as needed.

7. Review the results.

Have students report their findings back to the class.

8. Discuss the results.

Use the prompts below for a whole-class discussion.

- Mark the location of student plots on a map of the study area. Discuss abiotic factors encountered, such as temperature, sunlight, water, or wind. Ask: What abiotic factors were common to most of the plots? What factors were common to only a few of the plots?
- Identify difficulties encountered during sampling, including sampling of very small organisms, flying or crawling organisms, or physical factors such as rain or wind, and discuss possible effects on data. List possible sources of error in sampling data.
- Discuss biodiversity in the student plots and identify plots containing most/least diversity. Ask students whether they notice any correlation between location of plots, abiotic factors, and apparent biodiversity.

Modification

This activity is designed as an outdoor activity. To adapt it for inside, ask students to observe and record objects rather than wildlife specimens.

Informal Assessment

Have students write a paragraph that summarizes the observations they made.

Extending the Learning

Consider having students do this activity more than once. An inventory is a snapshot in time. It tells us what we have right now on this day, under these conditions. Different days and different conditions will produce different results. For this reason, inventories are most valuable when they are part of a monitoring program that allows you to track changes over time.

Species richness and evenness are other measures that scientists use to measure the variety of living organisms in a community. Richness is how many different types of organisms are found in an area, and evenness is the abundance of each organism. Comparing richness and evenness of an area over time is one method of monitoring ecosystem health. Changes in data over time may indicate environmental changes.

To calculate the richness of the sample, count the number of different “species” found in the sample. To calculate evenness, use the following equation. $Evenness = n_i/N$, where n_i = number of specimens found in group and N = total number of specimens found. When added together, the evenness number should total 1.

OBJECTIVES

Subjects & Disciplines

Biology

Geography

- Physical Geography

Learning Objectives

Students will:

- conduct a plot study
- make observations about the characteristics of plant and animal specimens
- record those observations in a scientific manner

Teaching Approach

- Learning-for-use

Teaching Methods

- Discussions
- Hands-on learning
- Multimedia instruction

Skills Summary

This activity targets the following skills:

- Critical Thinking Skills
 - Remembering
 - Understanding
- Geographic Skills
 - Acquiring Geographic Information

- [Analyzing Geographic Information](#)
- [Organizing Geographic Information](#)

National Standards, Principles, and Practices

NATIONAL GEOGRAPHY STANDARDS

- **Standard 8:**

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- **(5-8) Standard C-4:**

Populations and ecosystems

- **(9-12) Standard C-6:**

Behavior of organisms

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Clipboards
- Hula hoop
- Pencils
- Pens
- Rope (6-8')
- Rulers
- Thermometers

REQUIRED TECHNOLOGY

- Internet Access: Optional
- Tech Setup: 1 computer per classroom, Projector
- Plug-Ins: Flash

PHYSICAL SPACE

- Outdoor natural environment

GROUPING

- Large-group instruction

BACKGROUND & VOCABULARY

Background Information

Some species are relatively easy to locate and observe—they might be larger, more abundant, have unique characteristics, or stay rooted in place. Other species are more elusive—think of species that are small or agile, able to run, fly, or swim away. Or think of species that are active only at night, or live only in the tallest treetops or the darkest caves. Yet, during a BioBlitz, every species, large and small, counts. So, while participants need to know where to look and what to look for, it's also important to know how to make and record scientific observations.

Prior Knowledge

["field skills"]

Recommended Prior Activities

- [Field Investigations](#)
- [Neighborhood BioBlitz](#)
- [North Atlantic Right Whales](#)
- [Species Identification](#)
- [WildCam Observations](#)

Vocabulary

Term	Part of Speech	Definition
abiotic	adjective	lacking or absent of life.
bioblitz	noun	a field study in which groups of scientists and citizens study and inventory all the different kinds of living organisms within a given area.
biodiversity	noun	all the different kinds of living organisms within a given area.
plot study	noun	a list of all living organisms in a specific area.

Term	Part of Speech	Definition
scientific observation	<i>noun</i>	something that is learned, and can be repeated, by watching and measuring an object or pattern.

For Further Exploration

Audio & Video

- [National Geographic Video: A New Perspective on Biodiversity](#)

Websites

- [National Geographic: BioBlitz](#)

PARTNER



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