HANDS-ON LAB

Biodiversity All Around Us

Guided Inquiry

TIME REQUIRED Small groups 45 minutes

LAB RATINGS Easy 1 2 3 4 Hard

Teacher Prep–1
Student Setup–2
Cleanup–1

Materials

For each group:

- flashlight
- magnifying glass
- meter stick
- string, 4 m in length

For each student:

- lab apron
- safety goggles

3D LEARNING OBJECTIVE

Engaging in Argument from Evidence

Students will measure the biodiversity of a specific area and will study relationships between organisms. They will use evidence to support a claim about relationships in the sample area. Students will also hypothesize about how changes in the biodiversity of an area influence resources that are available to humans.

SAFETY INFORMATION

Remind students to review all safety cautions and icons before beginning this lab. Contact with certain plants and animals may cause injury or allergic reactions. Students should use caution while outside and should wash their hands at the end of the lab. Advise students to report broken flashlights or magnifying glasses immediately so that you can clean up any pieces of glass.

TEACHER NOTES

In this activity, students will explore how environmental factors and human activity impact ecosystems. Survey the areas that students propose to observe ahead of time to make sure they do not contain harmful plants. Adult supervision is recommended while students are making their observations. Lead students on a tour of the grounds outside your school. Ask them to describe their surroundings and identify areas where they would expect higher and lower levels of biodiversity. Challenge students to think of how they could assess biodiversity. Allow students to conduct all reasonable experiments in their selected study area. When students have collected and analyzed their data, have groups compare their results to determine how biodiversity changed with location. Ask students to develop a hypothesis about how changes in biodiversity in their study area influence resources that are available to humans.

Note: This lab could be extended to a field trip that involves parents. If you are unable to take students on a field trip, help them understand the difference between a severely disturbed area (a paved parking lot) and an area that is less disturbed (a natural area). Different levels of biodiversity exist everywhere and can be studied with students.

PUTTING THIS LAB IN CONTEXT

Encourage students to consider this activity in a larger context. Challenge students to think about changes in biodiversity with cause and effect in mind. What activities or events might cause a change in biodiversity in a region? What would the short-term and long-term effects be on relationships among organisms in that region due to that change? How would it affect humans?

ANSWER KEY

1. Answers will vary depending on the study site that students have selected. Students should include a thorough description of the area and any evidence of human activity they observed. They should also make a hypothesis regarding observing biodiversity in the area.

3. Answers will vary, but students should include a list of organisms and the number of each organism observed.

4. A) Students should describe potential relationships that exist among organisms observed. They should include labels for those organisms and relationships, including producers, consumers, predators, prey, parasites, mutualism, commensalism, and competition. Students should also explain the roles that these organisms play in the ecosystem.

B) Students should develop a hypothesis about how changes in the biodiversity of an area can influence resources that are available to humans.

Name: Date:

HANDS-ON LAB

Biodiversity All Around Us

In this lab, you will observe and measure the biodiversity of an area outside that you will investigate with your classmates. You will identify the relationships among various organisms within that area. While you will explore a small study site, this activity will lead you to hypothesize about relationships in the ecosystem based on relationships observed in the sample area. You will also hypothesize about how changes in biodiversity influence resources that are available for human consumption.

Materials

For each group:
- flashlight
- magnifying glass
- meter stick
- string, 4 m in length

For each student:
- lab apron
- safety goggles

PROCEDURE

STEP 1 As a group, select a site outside where you will observe and measure biodiversity. Describe the area you chose.

Do you see evidence of human activity? Do you expect your area to have high biodiversity? Why or why not?

STEP 2 Within the site you chose, use a **meter stick** and **string** to measure and mark off a 1 m x 2 m area. Use a **magnifying glass** and **flashlight** to carefully inspect the area you marked.

STEP 3 List all the different organisms you observe within your area. Count and record the number of each organism. If you cannot identify an organism, indicate that it is different (for example, list “plant A” and “plant B”). Make sketches of the organisms, when appropriate.

STEP 4 A) What kinds of relationships do you think exist among the organisms you observed? Explain your thinking using examples from this activity.

List any examples you saw of producers, consumers, predators, prey, parasites, mutualism, commensalism, and competition. What roles do these organisms play in this ecosystem?

B) Develop a hypothesis about how changes in biodiversity of an area influence resources that are available for humans. Use your site as an example.