# Bug Biodiversity:

## How Bugs Adapt to their Habitats

GRADES: 1st - 3rd

TIME FRAME: 90 minutes

SETTING: Outdoors

MATERIALS: Bug boxes, large bug container, aquarium nets, plastic bins or ice cube trays, clipboards, printed field notes, coloring utensils of choice

### LEARNING OBJECTIVES:

- To learn the term biodiversity and understand that it is important to a healthy habitat
- To record observations like a scientist by noticing details and asking questions

### OVERVIEW:

Students will explore two habitats to learn about biodiversity. Using bugs as the subject, they will collect different species and explore the differences between them through recording their observations by drawing in their field notes. Once they get to see the diversity of life in different habitats firsthand, they'll explore the meaning of biodiversity and discuss why it's important.

### NJ SCIENCE STANDARDS:

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

## PREPARE AHEAD:

Identifying the locations to do each of the habitat investigations is what takes the most prep work for this lesson. You'll want to find a forested area, which could be as small as an area with some rocks and trees, and an accessible water site, like a stream or a pond. Even small creeks can have insects living in them, so think outside the box for places you might find creatures with your students.

## BACKGROUND:

Insects have evolved to live in many different habitats and have diversified into millions of species, and this diversity can be easily observed for students to begin to learn this concept. Biodiversity, the variety of living things, is an important concept in ecology because the more biodiverse an ecosystem is, the more resilient it is to disturbances. During this lesson you'll use the diversity of insects to learn about biodiversity in two different habitats. Use the information below to collect insects with your students.

### Tips for Forest Bug Collecting

Materials: Use small clear bug boxes to catch, and a larger closed habitat to put the found bugs into.

Methods: Have students use a buddy system to flip over small rocks and logs. Students can dig through leaf litter and sift through the top layer of soil as well. Encourage them to use their containers, and not their hands, to collect bugs. Most bugs along the forest floor are harmless, but spiders and centipedes can bite, so containers are safer.

### Tips for Stream Bug Collecting

Materials: Use small aquarium nets and paint brushes for students to catch, and a large white plastic container or ice cube trays to put the caught creatures.

Methods: Catching bugs with nets is very challenging for small children, so encourage them to pick up rocks and look on the bottom. They can use paint brushes to remove them from the rocks and into the collection container.

## ENGAGE:

Begin by defining two important words: species and habitat. Give the definitions below, but they're best described with examples so be sure to engage in discussion about them so all students will use them confidently for the lesson.

> Species: a specific group of living things
> Habitat: a place that animals can live

Explain that to learn more about these things, the class will be going outside on a Habitat Adventure to learn more about the species that live there. The goal of the adventure is to gather evidence to answer this question: are the species the same in different habitats? Discuss this question, and push their thinking beyond when they just answer "no" (why not, how will we be able to tell, etc.) Before going outside, give safety directions and bring a bag with clipboards, worksheets, and writing utensils.

## PROCEDURE:

Forest Habitat: Explain that the first habitat they'll be exploring is the forest floor. Ask if anyone wants to make predictions about what species may live there. Then, give directions for finding species: each student (or pair of students) gets a bug box to collect any species they find on the forest floor. Set boundaries for students to stay in and give them 20 minutes to explore and find bugs. Once time is up, gather the class around the species they found. Hand out worksheets and have students draw 3 species that were found in the forest habitat. Ask students- how can we tell these species apart? Do any of these species have things in common? Recollect materials, release the bugs, and head to the second habitat.

Stream Habitat: Introduce the stream habitat, and ask students to make predictions about what they'll find there, and how species might differ between here and the forest habitat. Set boundaries and rules for the stream, and allow students to collect bugs (more generally, invertebrates) they find there for 20-30 minutes. Repeat the same protocol at the end, having students draw three of their found stream creatures. Ask them what the differences are between the species they found at the stream. Get them thinking with asking if they notice anything different overall between who was found at the stream versus the forest.

Culmination: Do this final part either back at the classroom or at picnic tables. Bring the question back: what are some things that set species apart? Have them look at their Field Notes to help answer this question with their own observations. Now that they've explored two habitats and learned about species, introduce the important concept of biodiversity.

a. Biodiversity: the amount of different species within a habitat
b. A habitat can have *high* (a lot of species) or *low* (very few species) biodiversity.

Have students turn over their Field Notes, and have them record this important concept, again, as scientists. Have them draw a habitat with high and low biodiversity. Before they draw, discuss what it looks like, which could include: that high biodiversity also includes many species of plants and that it is not just a bunch of one individual species; that low biodiversity could be caused by pollution or could be just a hard habitat to live in (Antarctica versus a jungle). If you have images of both examples to show, that could also be helpful.

# Field Notes

Draw three insects you see in each habitat.

|  Forest Habitat  | | |
|---|---|---|
| 1 | 2 | 3 |

| Stream Habitat | | |
|---|---|---|
| 1 | 2 | 3 |

Biodiversity

Draw a habitat with high and low biodiversity.

| High Biodiversity | Low Biodiversity |
| --- | --- |
| Many Species  | Few Species  |
| | |