



Insect, or Something Else?

Purpose:

Students will use observation to record, synthesize, and evaluate information about insects or other arthropods.

Objectives:

Students will record observations on a data sheet, and use that information to compare and contrast characteristics of arthropods and their habitats.

Materials

Provided in Kit:

- 10 Insect Nets
- 3 Mason Jars
- 3 Lucite Boxes
- 6 Magnifying lenses
- 5 Dichotomous key A
- 5 Dichotomous key B
- 5 Dichotomous key C
- Level 1 or level 2 data sheets (provided in teacher binder, make 1 copy per student)

Not Provided in Kit:

- Gaspers (see Build a Gasper activity)
- Bug terrarium (optional, see PDF instructions on thumb drive)

Activity:

Time Required: 1 hour and 15 minutes

Appropriate Grade Level: K-12

NGSS Standards:

K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

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

3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.



<p>Introduction</p>	<p>This activity is designed to follow the other lessons in the teacher binder. Make sure your students have enough background knowledge to successfully complete this activity.</p> <p>Review relevant information from previous lessons with students. Define habitat. For more advanced students, define arthropod, and review the taxonomic hierarchy.</p> <p>Instruct students on the best ways to collect and observe insects (refer to background section). Explain the activity instructions, purpose, objectives, and the expectations for the activity.</p>
<p>Body</p>	<p>Part 1:</p> <ul style="list-style-type: none"> • Distribute data sheets and go over the questions with the class. • Instruct students to collect and/or observe a reasonable number of insects. Recording accurate observations is more important than studying several insects. <p>Part 2:</p> <ul style="list-style-type: none"> • Lead students to an outdoor study area where arthropods are plentiful. • Divide the class so that small groups are exploring different sections of the study area. • After about 15 minutes, close this part of the activity by having students return any collected arthropods to the place where they found them. If using bug terrariums, make sure all arthropods are inside the containers with lids fastened before returning to the classroom. • Collect materials (nets, boxes, etc.) from students and put away. <p>Part 3:</p> <ul style="list-style-type: none"> • If using a dichotomous key, explain what it is and how it is used. Using the key and the information on their data sheet, students will find a Class or Order name, and a common name for each arthropod they studied. • (Optional) Distribute dichotomous keys and allow students about 15 minutes to identify their arthropods. <p>Part 4:</p> <ul style="list-style-type: none"> • Create a simple table to record what students observed (samples are provided with this activity). • Ask students if they think the results would be different if you were to collect data in a larger area. How about an area with more diverse habitats? How about an area with only one type of habitat?



Closure	After doing this activity, we have a sample of the diversity, or variety of arthropods that live near us. The Rogue Valley is a very diverse place for arthropods and other animals and plants. There are scientists who go outside and count insects, plants, frogs, and other organisms as a career. Ask students to think about why these jobs are important, especially where we live.
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Extension:

- Repeat parts 1-3 once a week for several weeks.
- When analyzing class data, consider what factors would influence the results over time, such as seasonal weather changes, or disturbance such as landscaping or forestry practices.
- Broaden the discussion to include the types of disturbances in your county, the whole Rogue Valley, state of Oregon, or United States, and how they might affect arthropods. For example, what might happen to the beetles in the forest after a wildfire burns the living and dead wood?

Modifications:

- **K-2 Students:**
 - Use the “Level 1” data sheet and do not use the dichotomous keys.
 - Decide whether you will use the term “insect” or “bug” (refer to glossary) instead of arthropod.
 - Use bug terrariums to study arthropod behavior in the classroom.
 - For Part 3 and 4, go around the room and have each student share the drawings from their data sheets, and share one piece of information about their insect/bug, such as where it lives, what it eats, or how it protects itself.
 - Ask students where else they have seen the insects/bugs the class found.
- **Grade 3-4 Students:**
 - Use either the “Level 1” or “Level 2” data sheet. The “Level 2” sheet requires students to identify arthropods using dichotomous keys.
- **High School:**
 - Use the “Level 2” data sheet. Students will identify arthropods using dichotomous keys.
 - Students will synthesize the class’ worksheet data in a table or graph, then discuss patterns and relationships between insect diversity and the environment where they collected data.
 - Students will report how many different arthropods were found, which arthropods were found near each other, any direct relationships between arthropods, or between arthropods and other organisms.
 - Ask students to make educated guesses about patterns and relationships. For example, if you only found Lepidoptera flying and landing on flowers, what could be the reason? (It needs to feed constantly on flower nectar.)



- Students can use ratios or statistics to predict what they might observe if they expanded their research to a wider geographic area. Would they find the same arthropods in the same abundance? Or would their results be very different? Explain in detail.
- **Advanced High School:**

Organize a 24-hour arthropod bioblitz. A bioblitz is an event that focuses on finding and identifying as many species as possible in a specific area over a short period of time. A bioblitz is also known as a biological inventory or biological census. The primary goal of a bioblitz is to get an overall count of the plants, animals, fungi, and other organisms that live in a place. Your bioblitz can be narrowed down to include arthropods and plants. Bioblitzes are often held in urban parks or nature reserves close to cities, and have a community component. You can find a complete lesson plan for National Geographic's Neighborhood Bioblitz at: <https://www.nationalgeographic.org/activity/neighborhood-bioblitz/>



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