

### GENERAL INFORMATION

#### THEME

Insects and spiders have unique adaptations that allow them to live in different habitats.

#### SUB THEMES

- 1) Insects are such a diverse group of organisms that we haven't even discovered them all.
- 2) Insects have important jobs in an ecosystem.

#### VOCABULARY

Biodiversity, niche, symbiotic relationships, mutualism, commensalism, parasitism

#### ACTIVITY MATERIALS

Insect sampling nets, viewing boxes, bush tarp, long stick, gloves, bug shape classification keys, data tables, symbiosis pictures

### METHODS

#### INTRODUCTION

Introduce yourself and state the title of the activity. Preview the main points of the activity and give students an idea of what they will be doing. Conversationally state the theme and sub themes. Ask: **What is biodiversity** (the variety of species in a given area)? **What group of organisms do you think has the most biodiversity** (insects, there are over 700,000 species of insects that make up over 50% of all species on Earth)? This makes insects a great group to learn about biodiversity. Explain that there are several factors that affect biodiversity, including the size of a given area, the climate of the area, and the availability of niches within the area. Ask: **What do you think I mean when I say 'niche'** (a niche is the role or job a species plays in an ecosystem)? Use the example of a dragonfly. Dragonflies are predatory insects that control other insect populations, such as mosquitoes. Explain that every organism, no matter how small, has an important niche within its ecosystem. Mention that predation is one type of interaction we may see today. Interactions between two species that benefit at least one of the species are called symbiotic relationships. Ask: **Can anyone tell me what are the three types of symbiotic relationships** (mutualism, commensalism, and parasitism)? Explain that mutualism is when both species benefit, commensalism is when one species benefits and the other one does not benefit but is not harmed, and parasitism is when one species lives on or inside another one while harming it. Show the symbiosis

### Teacher's Corner

#### Grade Level(s)

8<sup>th</sup> – 9<sup>th</sup> grade

#### Time

60 minutes

#### State Performance Indicators

##### SPI 0807

- Inq.2: Select tools and procedures needed to conduct a moderately complex experiment.
- Inq.4: Draw a conclusion that establishes a cause and effect relationship supported by evidence.
- 5.1: Use a simple classification key to identify an unknown organism.
- 5.2: Analyze structural, behavioral, and physiological adaptations to predict which populations are likely to survive in a particular environment.
- 5.4: Identify several reasons for the importance of maintaining the earth's biodiversity.

##### SPI 3210

- Inq.3: Determine appropriate tools to gather precise and accurate data.
- Inq.5: Defend a conclusion based on scientific evidence.
- 2.1: Predict how population changes of organisms at different trophic levels affect an ecosystem.
- 2.2: Interpret the relationship between environmental factors and fluctuations in population size.

# Incredible Insect Inspectors

## INTRODUCTION (cont.)

pictures, read the writing on the back, and ask the students to guess which type of relationship goes with each picture.

## ACTIVITY

Explain that the students are going to sample insects from three different habitats: a weedy area, a lawn area, and a bush. First sample the weedy area and lawn area by using a sweep net to sweep up insects. Dump the sample into the viewing box making sure the students using the net are wearing gloves. Discuss the difference between the diversity of the two habitats. Let them use the shapes card to help them classify their insects. You can include spiders in the sample as well; just explain that spiders are not insects but rather arachnids. One way you can distinguish this is by counting the legs. Insects have six legs and spiders have eight legs. Ask them if they have found any symbiotic relationships in action or if they have located any of the insects seen in the pictures from the introduction.

Now have them predict what kind of diversity they expect to find from the bush. Place a tarp or sheet below the bush and have one student beat the bush with a long stick. After each sample, have the students tally the number of different types of bugs. Again, let them use the shapes card to help them classify their insects. Bring the group back together and discuss their results as a group.

## DISCUSSION

Review the following points: Discuss the number of insect species found. Which habitat had more species diversity? Discuss the reasons for this. The difference between the lawn and other two habitat types will be obvious. However the differences between the bush and weedy area, if there is much, will not be obvious. Discuss some possible reasons (e.g. adaptation, seasonality and availability of food, protection from predators, cover for finding prey, etc.). Discuss some of the adaptations that these insects show for living in these environments. Mention some of the symbiotic relationships observed.

## WRAP-UP

Allow students to replace anything they have collected. Let the group know that the activity is coming to an end. Conversationally review the theme and sub themes. Collect the data sheets.

## BRINGING IT TO THE CLASSROOM

Using the data sheets, discuss how populations can be studied and why it is important to have that type of information. Using one student's sheet as an example, calculate the population density for one species using an estimated unit area (Population density = # individuals/unit area). Have students complete their own calculations. Discuss ways they might have underestimated diversity (techniques, insect camouflage, time spent sampling, and disturbance from students and other classes).

## ACKNOWLEDGEMENTS

- Copyright © 2008 Healing Stones Foundation. All rights reserved.
- Activity developed by Allison Mains and updated by Melissa Squirlock; January 2007.