Insect Safari

Overview: Gardens usually have more insect inhabitants than plants. In this lesson, students sharpen their observation skills by going on an insect safari to uncover the secret lives of these important garden residents.

Grade Level/Range: K – 12

Objectives: Students will hunt for insects in the garden and determine if they are beneficial or harmful to their plants.

Time: 30 minutes to an hour

Materials:

- Paper
- Pencils
- Clipboards or cardboard pieces
- Insect ID book or website
- Optional: hand lens, insect net

Background Information:

There are over one million known species of insects in our world, making up nearly 75% of the animal kingdom. Unfortunately, we often give insects a bad rap by focusing on those we consider pests - those that cause damage to our food crops (such as aphids, whiteflies, and potato beetles), our homes (such as termites) and our bodies (like mosquitoes and ticks). But these pests are a very small percentage of the overall insect population. Most insects play unseen but important roles in our ecosystem, and some provide us with very obvious benefits such as useful products (honey from bees and silk from silkworms), protection from pest insects through predation and parasitism of pest species (ladybugs and lacewings), pollination of food crops (about 30% of our food crops depend on insect pollinators such as bees) and decomposition of dead organic materials (blow flies, dung beetles). We often call these important six-legged creatures beneficial insects.

Advanced Preparation: None.

Laying the Groundwork:

Ask students to share their thoughts about insects. As individuals or as a class, write descriptions of insects, create word webs, and/or draw insects using their current conceptions. Ask questions that prompt students to reflect in greater detail. If they mention that insects have legs, for instance, ask them how many and where they're found. Have them brainstorm and list what they know about how insects interact with plants. This will give you and your students something to revisit as they later explore insects and plants up close.

Exploration:

1. Announce to students that they will be going on an insect safari in the school yard. Encourage them to wear comfortable clothing and shoes. For fun, younger students may enjoy crafting special safari hats.
2. Before going out on the safari, explain that their job is to observe, draw, and gather information about garden insects. They can work as individuals or in teams. To adapt the activity for younger students, you may want to provide flash cards of specific insects for them to search for. With older students, you may want to add equipment for more intense study such as hand lenses or insect collecting nets.
3. Remind them to look in the soil, under leaves, on flowers, and in the air. After all, many creatures carry on their lives out of sight. What is the largest insect they find? The smallest? The most interesting? Instruct them to write about and draw pictures of their findings. Encourage them to include as much detail as possible.

Making Connections:

After you return to the class, create a list of all the insects observed and their characteristics. Refer back to the students' reflections before the safari. Did they find any differences between their original ideas about insects and what they observed in real life? What preconceptions were accurate and which were false? What new things did they learn about insects?

Use guide books or internet sites to help positively identify all insects observed. Next challenge students to group the insects based on similarities and differences. Follow up by having students research how scientists classify insects, then compare those categories with their own. (Insects are grouped into orders according to physical characteristics and life cycles. Beetles, for instance, are in the order *Coleoptera*, the members of which are distinguished from other insects by their hardened outer wings that form two halves when folded, two pairs of wings, chewing mouthparts, and complete metamorphosis.)

Lastly, determine whether the insects observed are beneficial, harmful, or neither to plants. To help you identify common beneficial insects, check out online resources such as Beneficial Insects in the Yard and Garden (University of Nebraska Extension); Natural Enemies Gallery (University of California IPM); or Beneficial Insects – Nature's Pest Control (Cornell University). A good resource for identifying common garden pests is Twenty-five Pests You Don't Want in Your Garden (PA IPM Program).

Branching Out:

- Use the information collected during the safari and the follow up research to create an insect guide for your schoolyard to share with other classes. Make sure to identify which insects are garden pests and which are beneficial.
- Invite a local entomologist to speak to your class. Ask him/her to bring an insect collection to share with the students for further study.
- Middle school and high school students may be interested in starting a bug collection.
- Adopt garden methods and add design features to your garden to attract beneficial insects. To make sure your garden is hospitable to beneficial insects don't use any pesticides (organic or chemical). Although some target specific pests, many will harm both problem and beneficial insects.

Also make sure your landscape includes plants the beneficial insects need for food. Although many of these insects prey on other insects, they may also need nectar and pollen for a well balanced diet at different stages of their lives. To provide the appropriate food resources plant a diversity of plant species, especially ones native to your area. Many beneficial insect species are attracted to the flowers of plants in the cabbage, carrot, and sunflower families. Some examples of beneficial insect attracting plants are bee balm, borage, broccoli, buckwheat, columbine, calendula, candytuft, chervil, chives, cilantro, clover, daisy, dill, milkweed, Joe Pye weed, fennel, goldenrod, mint, parsley, Queen Anne's Lace, sunflower, sweet alyssum, tansy, thyme, and yarrow. The caterpillar or immature stage of butterflies and moths often has specific food plant requirements. For example, the caterpillars of monarch butterflies feed exclusively on milkweed plants.

Resources:

Beneficial Insects in the Yard and Garden
http://lancaster.unl.edu/pest/resources/339_beneficialbugs.pdf

Natural Enemies Gallery
http://ipm.ucanr.edu/PMG/NE/index.html

Beneficial Insects - Nature's Pest Control
http://idl.entomology.cornell.edu/files/2013/11/Beneficial-Insects-1sdvh6p.pdf

Twenty-Five Pests You Don't Want in Your Garden
http://extension.psu.edu/pests/ipm/pestproblemsolver/house/home-garden/insects/25pests