

Building a Happy Home - Bugs in Balance

Overview: Although gardeners may be tempted to classify insects as either pests or beneficial organisms, the reality isn't so simple. Successful gardens mimic nature, where diverse organisms keep each other's populations in check to create a natural balance. For example, at first glance, insects that eat your plants (like aphids) might clearly fall into the pest category. However, look deeper, and you might learn that these "pest" insects are an essential food source for the beneficial insects that you welcome to your garden (like lady beetles/ladybugs). Thus, these so-called pests are beneficial in their own way.



In this lesson, students explore the needs of insects as a step toward viewing their garden as a complex ecosystem and habitat for a multitude of life forms.

Grade Level/Range: 5th - 8th Grade

Objective:

Students will:

- Understand that a garden can be a habitat
- Investigate garden food webs
- Learn how to make their garden a place for a diversity of life to call home

Time: 1 Hour

Materials:

- Internet or library access
- Insect Profile Worksheet

Background Information:

What is a habitat? It's a space that provides the conditions and provisions an organism needs to survive, including the basics of food, water, shelter, and a place to rear young. In most gardens, the focus is on the plants. However, gardens also provide a marvelous habitat for different types of animal life, including many insects.

Because most gardeners are attuned to how well their plants are growing, it is common to hear of insects being labeled as pests if they cause damage to plants or as beneficial if they help control pests.

However, when you begin to look at your garden as an ecosystem and habitat — and more than just a space for human enjoyment — these simple labels aren't so clear-cut. Because if you eliminate the pest insects, you'll also drive away the beneficial insects that feed on them, keeping them (and other pests) in check. The so-called pests perform an essential role as a food source for beneficial insects, so they, too, are a beneficial part of a healthy habitat.

For example:

- You view your tomato plant as a source of juicy tomatoes, but it looks just as tasty to the tomato hornworm caterpillar that eats tomato leaves. However, hornworms are also hosts to parasitic

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wasps (that lay their eggs in them) and are food for lady beetles and lacewing larvae. So, if you tolerate losing a few tomato leaves to hornworm damage, you'll be nurturing these natural pest controls that not only prey on hornworms but also help control other garden pests.

- Aphids are considered a pest because they feed on young plant tissue. But they're also an important food source for lady beetles, which in turn also help control chinch bugs, weevils, thrips, mites, mealybugs, Colorado potato beetles, spider mites, whiteflies, mealybugs, and more. No aphids can mean fewer lady beetles to control other pests.

In short, if you eliminate the "pest" insects, the garden won't be as attractive a habitat for the beneficial insects.

Creating an Inviting Insect Habitat

To make sure your garden is hospitable habitat for all insects:

- 1. Avoid pesticides.** Don't use any pesticides (organic or chemical/synthetic). Although some target specific pests, many will harm both problem and beneficial insects. (See Trap Crops below.)
- 2. Include a diversity of plants.** Even insects that prey on other insects may need nectar and pollen for a well-balanced diet in different stages of their lives. To create an inviting habitat, include a diversity of plant species — especially plants native to your area as well as those in the cabbage, carrot, and sunflower families. Good habitat plants include bee balm, borage, buckwheat, calendula, candytuft, chervil, chives, cilantro, clover, daisy, dill, fennel, goldenrod, mint, parsley, Queen Anne's lace, sunflower, sweet alyssum, tansy, thyme, and yarrow.
- 3. Provide a water source.** Just like all animals, insects need fluids to quench their thirst. Shallow pools of water in-filled with perching stones or gravel are insect magnets on hot, sunny days.
- 4. Give them shelter.** Let an area of your garden or green space go "wild." A wooded area or hedgerow 10' to 20' north of the garden is ideal, but even a small undisturbed area will give insects a place to shelter and nest. You can also leave a patch of lawn unmown — turfgrass can be home to insects.

Trap Crops

Instead of trying to eliminate pest insects using pesticides, consider planting a "trap crop." Most insects will munch on a variety of plants but often have a favorite. If you have problems with insects damaging one of your crops, try planting a trap crop — a plant they'll like even more to lure them away from your crops. For example:

- The squash vine borer and squash bug are common pests of plants in the cucurbit family (squash, pumpkins, and cucumbers). These critters have a strong preference for the Blue Hubbard squash, so you can try planting Blue Hubbards just to help keep them from munching on your crop plants (knowing that the Blue Hubbards may produce few, if any, fruits).
- Nasturtiums are a magnet for aphids and attractive to flea beetles and cabbage moths, luring them away from your crop plants. Additionally, their flowers provide nectar for many beneficial insects, like predatory wasps and pollinating bees.

Laying the Groundwork

Ask students the question, "Is our garden a habitat? Why or why not?"

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Draw a line down the middle of a chalkboard or dry erase board and write down the reasons they generate to support the answers of “no” and “yes.”

Once they have had a chance to brainstorm, have them dig deeper by defining the characteristics of a habitat. (Prompt them, if necessary, so their list includes that a habitat provides its inhabitants with food, water, shelter, and a place to rear young.)

Go back to your debate and decide whether or not your garden is a habitat.

Exploration

1. Use the background information to discuss with students how some insects that live in the garden get labeled as “pests” or “beneficials” and why. What do they think about those labels?
2. Next, ask students to research insects often classified as beneficial in a garden and create a list of what they find. The list may include lady beetles, lacewings, garden spiders, praying mantis, dragonflies, ground beetles, parasitic wasps, tachinid flies, and assassin bugs.
3. Individually or in pairs, ask students to research one of the insects from your list and fill out the Insect Investigation Worksheet.
4. Once their research is completed, have students share what they found out about their insect with the class. Make a list of all of the food consumed by your insects. Does the list include any insects that are often labeled as “pests?”
5. To extend the lesson, have students research if there are any predators of their chosen insects and use the compiled information to create a food web of all the living things found in a garden.

Making Connections:

- Talk about the “beneficial” and “pest” labels. Ask students, from whose perspective do these labels originate?
- Ask students to consider the idea of an ecosystem in balance. How does that relate to the idea of beneficial and pest insects in a garden?
- What happens when insects are not in balance? What happens when an insect moves into an ecosystem where it does not have anything to keep its population in check naturally? You may want to use the [spotted lanternfly](#) or another [hungry pest](#) as a case study.

Branching Out:

Plan a habitat hunt in your school garden or a local natural area. Look for examples of beneficial and pest insects in your space. Do insect populations seem to be in balance?

Does your location meet the conditions needed to be an insect habitat? If not, use the tips above in the Background Information and brainstorm together ways your space could become an even better habitat for insects.

Related Articles:

Beetle Banks: <https://kidsgardening.org/resources/digging-deeper-beetle-banks/>

Encourage Pollinators and Other Beneficial Insects: <https://kidsgardening.org/resources/gardening-basics-encourage-pollinators-and-beneficial-insects/>

Create Overwintering Habitat with an “Untidy” Garden:
<https://kidsgardening.org/resources/gardening-basics-create-overwintering-habitat-with-an-untidy-garden/>

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Insect Profile Worksheet

Common Name:

Scientific Name:

Diet* (circle one):

Herbivore

Carnivore

Omnivore

Life Cycle (circle one):

Complete Metamorphosis
(egg, larva, pupa, and adult stages)

Incomplete Metamorphosis
(egg, nymph, and adult stages)

Draw pictures of your insect at each stage in its life cycle and label them:

List what your insect eats during each stage of their life cycle:

Does your insect have any additional special habitat needs?

*Herbivores eat plants. Carnivores eat primarily insects/animals.
Omnivores eat both plant and animal matter.

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