

Lesson Title and Summary

Good Bug/Bad Bug

This is an outdoor lesson and activity. It will introduce and teach the participant that there are many bugs/insects in our environment that serve a variety of purposes and that most bugs are beneficial to our plants/gardens. They will learn about the helpfulness or harmfulness of bugs to our environment and how to manage the harmful bugs. The children will participate in a game of finding rocks depicting good and bad bugs, then classify them.

Learning Goals and/or Objectives

1. The participant will be able to name at least 3 beneficial garden bugs and how they help the garden.
2. The participant will be able to name at least 2 harmful bugs and how to manage them in the garden.
3. The participant will be able to classify beneficial/good bugs into 4 categories.

Target Grade(s)/Age(s) and Adaptation for other Grades/Ages

Grades 1-4.

Younger students: Have bug rock hunt in a smaller area and more assistants per child, discuss fewer good and bad bugs in simpler terms.

Older students: Omit insect song and include more scientific data and/or information on pollination and bee colony collapse.

Lesson Time

30-45 minutes

Preparation, Space Requirements, Personnel needed, Supply List

Good bugs/bad bugs pictures and facts (overhead projector, PowerPoint, white board, or chart), 3-5 rocks per student (with pictures of a good or bad bug on each rock), 5 charts with one category on each sheet and description on back (pollinator, predator, parasite, pooper, pest).

Way to signal when game is over (wind chime, whistle). Large space for rock hunt, meeting area. *Picture rocks need to be distributed in surrounding area before the start of the lesson.*

One instructor/assistant per 5-10 students for activity/game.

Lesson Plan

Intro/Engage the Students: (5 minutes)

- Sing insect song to the tune of Bingo: ***I am an insect in this garden and this is what I'm made of: 2 antennae, Compound eyes, 1-2-3, 4-5-6 legs, A set of wings so I can fly, A head, thorax and abdomen.***
- Introduce adults and go over guidelines.
- Jokes/Riddles: Why are frogs so happy? *Because they eat what bugs them!*

I flutter by the flowers, sipping up my lunch. My babies look like little worms and leaves are what they munch. What am I? *A Butterfly*

Why did the bee cross the road? *To get to the flower.*

Lesson Steps and Activities: (20-30 minutes, allow 10-15 minutes to discuss beneficials and pests, 5-10 minutes for the insect game.)

- *Teach that many of the beneficials and pests are insects and that 98% of insect species are beneficial: of every 100 insects, only 2 are “bad” or harmful in our gardens. Discuss the categories Pollinator, Predator, Parasite, Pooper, and Pest then discuss at least one or two beneficials from each category and 3-5 pests common in your area. Show pictures of the bugs (PowerPoint, poster, or overhead projector), ask what it is and what do you know about each bug. Ask if it is good or bad in our gardens and if it is a pollinator, predator, parasite, pooper, or pest.*

Five charts with the “P” categories on the front and descriptions on the back.

Pollinators: Discuss pollination (take pollen to other plants so they can grow and produce fruit and seeds), and why important for plants and us. To encourage flying beneficials, we can grow flowering plants that provide the nectar and pollen they need at certain times in their life cycles.

Predators: Prey on other insects; eat pests that harm plants.

Parasites: Destroy pests by laying their eggs on or inside them. When the eggs hatch, the parasite feeds on the pest.

Poopers: Also known as decomposers. They eat, digest, and excrete (poop) dead plant material so that the nutrients in the plant material are returned to the soil; break down plant waste into fertilizer. They also aerate (add air) the soil, which improves the soil structure.

Pests: Eat and harm plants that we want to eat. Eat and harm plants that help our gardens be beautiful.

Beneficials:

Ground Beetles-Shiny black, ½-1” long insects. The smaller species eat other insects, caterpillars, cutworms, and grubs; some smaller species prey on slugs and snails and their eggs.

Predator (Larvae-Pooper)

Lady Bugs (Lady Beetles)-Feeds on aphids, mealybugs, spider mites and other pests. **Predator**

Lacewings-1” long flying insects that feed only on nectar, pollen, and honeydew; but the larvae (look like ½’ long alligators) eat aphids, leafhopper, thrips, mites. **Predator**

Spiders-Spiders catch all kinds of insects. The spiders that are dangerous to us are not garden spiders, they do not live in gardens, and they usually do not live in our area. We can be thankful for spiders because they eat garden pests; they are a natural pest control! **Predator**

Honey Bees-pollinate, plus make honey. **Pollinator**

Yellow Jackets/other wasps- pollinate and eat many pests (caterpillars, flies, beetle grubs). **Pollinator**

Parasitic Wasps-lays eggs in pest host and the immature wasp feed inside the pest. **Parasite**

Butterflies-pollinators and food for some birds. **Pollinator**

Dragonflies and Damselflies- eat mosquitoes, aphids and other pest bugs. Predator

Predatory Mites-predatory of pest mites such as spider mites. Predator

Preying Mantids-preys on many pests but will also eat other beneficial insects including butterflies. Predator but can also be Pest when preys on beneficials

Centipedes-prey on pest and insects in the soil including slugs, worms, and fly pupae. Predator

Worms such as earthworms, red wigglers-Aerate the soil and add nutrients to the soil through their digestive process. Pooper

Pill Bugs (Sow Bugs, Roly-Poly)- Feed on dead plant matter. Pooper

Nematode-Worm-like. (Pooper)

Pests: Discuss how they are harmful and how to manage garden pests. Teach that beneficials need to be encouraged by not using pesticides which kill both beneficials and pests. Discuss how to discourage pests by building healthy soil, sowing plants in the correct place and at the the proper time, giving plants the proper care and correct amount of water and growing plants that provide nectar and pollen throughout the year.

Slugs-eat leaves of plants, whole plants and/or leave ragged holes in the leaves.

Aphids-About ¼” long insects, suck plant sap.

Leaf Miners-very small, only 1/10,” larvae damage leaves of edible crops by mining inside of leaves.

Cutworms-moth larvae (brown segmented casing) that chew through plant stems at the base or under the soil and may feed on foliage.

Leafhopper-Inserts eggs into plant stems. When hatched, they eat the sap on the host plant.

Grubs/Beetle Grubs-The larva of beetles, eat many crops.

Mealybugs-Insects that feed on plant juices.

Thrips-very small, less than 1/25”, feed on plant and flower tissue, extract the plant’s fluids.

Gall Mites-very small (microscopic), damages plant foliage.

- Explain Activity/Game: Have participants search for 3-5 hidden picture rocks in outlying area. Give boundaries and any guidelines (they may not collect more than one of each kind of bug, number of total rocks to collect, come back in 5-10 minutes when signal sounds). When gathered back, ask each participant to partner with the person next to them to divide/classify their rocks into 2 groups: Beneficials and Pests. Ask them to name the insects as they classify. Monitor activity then ask to name some pests. Make corrections. Then have participants classify their beneficials into their benefit category (pollinator, predator, parasite, pooper). Briefly check each group and discuss; ask to name some beneficials from each category. Have participants bring rocks to front or other designated place, or ask to re-distribute rocks for subsequent groups (give parameters and remind to have bug picture showing on top of rocks).

Reflection/Review: (time needed)

Reflection/review (5 minutes): Questions, elicit responses from the children:

- Name beneficials and their category, name pests and tell how to manage.
- What should you do if you see a spider, bee, etc? (Leave alone!)
- Are pesticides the best way to deal with garden pests?

If “The Good, the Bad, and the Downright Ugly” flip book will be given to the classes’ teachers for their classroom library, go over the booklet. The green pages are beneficials and the brown pages on the other sides are garden pests. Point out the pages on healthy gardens, managing pests, stormwater and chemicals.

Vocabulary

beneficial	aerate
pest	thorax
nectar	abdomen
pollen	soil
pollinate	antennae
fertilize	compound eyes

Pollinators: Pollinators take pollen to other plants so they can grow and produce fruit and seeds. Without pollinators, we would not have much of the foods that we eat. To encourage flying beneficials, we can grow flowering plants that provide the nectar and pollen they need at certain times in their life cycles. *(Honey Bees, Yellow Jackets and Wasps, Butterflies)*

Predators: Prey on other insects; eat pests that harm plants. *(Ground Beetles, Lady Bugs, Lacewings, Spiders, Dragonflies, Damselflies, Predatory Mites, Praying Mantis, Centipedes)*

Parasites: Destroy pests by laying their eggs on or inside them. When the eggs hatch, the parasite feeds on the pest. *(Parasitic Wasps)*

Poopers: Also known as decomposers. They eat, digest, and excrete (poop) dead plant material so that the nutrients in the plant material are returned to the soil; break down plant waste into fertilizer. They also aerate (add air) the soil, which improves the soil structure. *(Ground Beetle larvae, Worms, Pill Bugs/Sow Bugs)*

Pests: Eat and harm plants that we want to eat. Eat and harm plants that help our gardens be beautiful. *(Slugs, Aphids, Leaf Miners, Cutworms, Leafhopper, Grubs/Beetle Grubs)*

Lesson plan by WSU Extension Clark County Master Gardeners, Deanna Hastings and Barbara Nordstrom; game created by Barbara Nordstrom. Predator, parasite, pollinator, and pooper categories are from the Jr. Master Gardener “Garden Friends and Foes” lesson.