



University of Kentucky
Department of Entomology
Insects in the Classroom: Lesson Plan No. 105
BENEFICIAL BUG
SCAVENGER HUNT
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Developed from an activity designed by Dr. Ric Bessin

Activity Description

Hands-on Discovery Lab

Age Group: Can be adapted for elementary through high school.

Objectives

- ❖ Students will learn to identify several beneficial insects and spiders, including predators and pollinators.
- ❖ Students will search an outdoor environment and record numbers and types of beneficial insects and spiders that they discover.
- ❖ Students will choose one insect or spider that they observed, and write a brief description detailing the appearance and behavior of the creature and where it was found.
- ❖ Students will present their observations to the class during the following class period.
- ❖ Students will discuss the ways that the insects and spiders that they observed are adapted to be pollinators or predators.

Academic Expectations

The above objectives fall under KERA's Science Academic Expectations:

- 2.2 Identify, analyze, and use patterns such as cycles and trends to understand past and present events and predicting possible future events.
- 2.3 Identify and analyze systems and the ways their components work together or affect each other.
- 2.5 Understand that under certain conditions nature tends to remain the same or move toward a balance.
- 2.6 Understand how living and nonliving things change over time and the factors that influence the changes.

BENEFICIAL BUG HUNT

Lots of insects are pests. They bite us and eat our crops. So it's easy to forget that lots of insects help us, too. Predatory insects and spiders are nature's insecticides, keeping pest species at low numbers. And many of our beautiful flowers wouldn't exist without bees, flies, and butterflies to pollinate them.

Throughout the spring, summer, and fall in Kentucky, outdoor gardens and flower patches are great places to find beneficial insects. If your school has a small garden, or if you can arrange a field trip to a public garden or arboretum, you can introduce students to some of these "good guy" insects.

For this discovery lab, all you need to do is familiarize your students with a few common beneficial insects, and then let them start searching. Despite what you may think, it's not hard to learn how to identify a few of the most common types of beneficial insects. Everyone knows what praying mantids, wasps, and lady beetles look like. Bees, flies, and butterflies are pretty easy too. If you have a field guide to insects, you can show students

pictures of some of the not-so-well-known beneficial insects, such as green lacewings and assassin bugs. Attached is a sheet with pictures of most of these insects that you can distribute to your students if you have access to a color copier.

Since students will be recording how many of each kind of critter that they see, how about a prize for the student who sees the most, or the most different kinds? Also, encourage students to note and describe insect predators or insects that are visiting flowers that aren't on the list. With a little research, they can probably figure out what these insects are as well.

Below are some basic facts about each kind of beneficial arthropod. Use this info as ammunition to keep the discussion going as students talk about their observations.

PRAYING MANTIDS: There are three species of praying mantids that occur in Kentucky. The largest is the Chinese Mantid, which can be nearly 4 inches long. Praying mantids catch victims in their front legs and devour their prey with chewing mouthparts. Praying mantids are also excellent jumpers. They can fly too, but they don't do it very often.

LADY BEETLES: Lady Beetles, also called "ladybugs," are very common garden predators. They specialize in aphid control. There are several species of lady beetles in Kentucky. Some of them are shiny and black, but most of them are red with black spots. Baby lady beetles are also predators. They don't look very much like beetles, though. Immature lady beetles are more like caterpillars, and they have to go through a pupal stage (just like butterflies and moths) before they become adults.

GREEN LACEWINGS: Although many people aren't familiar with green lacewings, they are very common in Kentucky. They look a bit like small green dragonflies, but they are more closely related to beetles. Like lady beetles, adult and immature green lacewings like to eat aphids. Also like lady beetles, baby green lacewings go through a pupal stage before becoming adults. There is also a Brown Lacewing that is common. It is slightly smaller than the green lacewing.

WASPS: Wasps are known for their painful stings, but they are also very helpful. Most wasps are predators. They feed on caterpillars and other pests. Some wasps are "parasitoids." Parasitoid wasps lay their eggs inside caterpillars, where the larval wasps develop, eventually killing the host. Parasitoid wasps are important pest control agents in many crops. Many people don't realize that ants are wasps too. Many kinds of ants prey on pest insects.

ASSASSIN BUGS: Assassin bugs aren't as well known as praying mantids, but they are just as fascinating, and just as voracious. Instead of chewing their prey, assassin bugs use their tube-like mouthparts to suck juices from their victims. They are also better fliers than praying mantids. The "wheel bug" is one of our largest and most common assassin bugs. It has a large structure on its back that resembles a wheel. Many assassin bugs are able to bite people, so watch out!

SPIDERS: There are many different kinds of spiders. They come in lots of colors and shapes, but they have one thing in common: they are all predators. Spiders have venomous fangs that they use to subdue their prey. Most spiders aren't dangerous to people, though. Although many spiders make webs to catch prey, some, like wolf spiders, are active hunters that search the ground for food.

POLLINATORS: Many bee, fly, butterfly and moth species are important pollinators. They are drawn to the bright colors of flowers where they feed on nectar. As these insects feed, they transfer pollen from flower to flower. This allows the plants to reproduce. Pollinator insects often have furry bodies that allow them to pick up lots of pollen. Many bees and

flies are also able to hover, just like hummingbirds. This lets them remain in flight while feeding on nectar. Many pollinators also have long tongues that allow them to probe deep inside flowers for nectar. Scientists believe that bright, colorful flowers and pollinator insects evolved together. That means that if there were no pollinating insects, there might not be any flowers.

(student handout)

NAME _____

BENEFICIAL BUG SCAVENGER HUNT

BUG HUNT TALLY (20 points):

Find as many different kinds of beneficial insects and spiders listed below that you can. Place a tally mark beside each kind of creature each time you find one.

PREDATOR	TALLY
PRAYING MANTID	
LADY BEETLE	
GREEN LACEWING	
WASP	
ASSASSIN BUG	
SPIDER	

POLLINATOR	TALLY
BEE	
FLY	
BUTTERFLY/MOTH	

DESCRIPTIONS (40 points):

Write a description of the insect or spider that you liked the most, or that you spent the most time observing. What did it look like? Do you think it was a predator or a pollinator? Was it camouflaged or brightly colored? Was it on a plant? Where? Was it eating anything? What else was it doing?

CONCLUSIONS (40 points)?

After the class has discussed the different insects and spiders that they observed, write down some of the things that you learned about predators and pollinators. What things did some of the insects have in common? How were they different? In your opinion, what adaptations did the creatures have that allowed them to be better predators or pollinators?



PRAYING MANTID



LADY BEETLE



LADY BEETLE



GREEN LACEWING



PAPER WASP



POTTER WASP



ASSASSIN BUG



CRAB SPIDER