



# Bugs

There are over 8 million different species of insects in the world! There could be over 2000 in a square foot! Insects aid in the decomposition of organic matter and in the formation of soil. They are responsible for the pollination of almost every fruit, flower, and vegetable crop. They serve as food for birds, reptiles, small mammals, and other insects.

## Student Learning Objectives

- 1. Learn and understand what an insect's job is, and where they live.**  
(Insects aid in the decomposition of soil, living in leaf litter, a combination of decomposing leaves, sticks, small animals, wet soil, organisms and lots of bugs. Bugs travel in and around soil leaving tunnels which helps with aeration of soil. Bugs can also help in pollination of fruit, flowers and vegetable crops.)
- 2. Observe and document five different types of insects seen in containers.**  
Some examples: (slugs, millipedes, centipedes, ants, earwigs, squash bug, bee-tles, earthworms)
- 3. Identify different anatomy parts of each type of insect found.**  
(Head, thorax, abdomen, legs, and wings)
- 4. Identify what the study of insects is called (entomology).**  
(Entomologists have divided insects into 32 different orders; some might be millipedes, centipedes, crustaceans.)
- 5. Identify how bugs eat.**  
(They use three different types of mouthparts for chewing, piercing and sucking, and biting.)

## Student Worksheet Questions

Review the worksheet questions with students at the beginning of lab and at the end. The worksheet may also be printed out for students to complete as part of the field trip.

1. Why are bugs important in our soil?
2. How do they aerate the soil?
3. How is leaf litter created?
4. What are the five anatomy parts of bugs?
5. What is the name of someone who studies bugs?
6. Describe how bugs eat.

Note: The teacher may want to have additional material covered and will add to these questions. Take time to talk with the teacher in advance of the field trip.

## Field Trip Requirements

- Several laminated pictures of all insects found in the leaf litter (maybe a few that will not be in the containers, can also include pictures of ants, ladybugs, beetles, spiders, etc.) These are at the end of this lab.
- 4 - 5 clear plastic tubs (best size: 18" x 24")
- Collect enough leaf litter to fill 1/3 of each container.
- The day before, collect 7 or 8 different kinds of leaf litter insects for each container. Store in a large bin or trash can to keep in moisture and cover to keep bugs in. Be sure the lid has air holes.
- Plastic spoons and clear low cups for each student.
- Have wet wipes and a garbage bag for trash.

## Field Trip Outline

1. The golf course superintendent or golf course representative should begin the bug lesson by asking students if they have looked in the soil at their homes, and whether they know why bugs are important to soil. Let students share some of their knowledge. Show and explain to students, what leaf litter is and why it is important in a bug's life. Let them feel and touch it. Ask them how insects help with pollination; let them have a moment to think of what they do.

Bees pollinate flowers; small animals, birds, and insects eat bits of fruit then poop seeds out in various areas. Refer to the questions at the beginning of the lesson plan.

2. If the learning lab is located where the students can see areas of the golf course, or a place where there might be leaf litter, point out some of the natural features such as: natural areas, wetlands, or wildlife corridors. Help students understand that these areas promote leaf litter, aerated soil, and pol-ination of small animals and insects. Ask students if there are other areas that they can think of that would have leaf litter and lots of bugs. Some of their answers might be: forests, gardens, or native areas. Ask students if they think all soil or leaf litter is the same? If the soil is dry and hard, what would that mean to the bugs?
3. Let the students look at the laminated pictures of your “found” bugs, before they get into the tubs to look for insects. Review the pictures with them so they know the names of the bugs. Some might be: slugs, worms, millipedes, centipedes, stinkbugs, sow bugs, earwigs, or beetles.
4. Once the students are comfortable with the names, let them carefully start dipping their spoons into the plastic tubs. Remind students that bugs are living creatures, and that they need to be careful in lifting and placing them back in the leaf litter. Students will use the spoons to lift their bugs into their cups to see them more clearly. As the students are looking through the containers, talk about how the bugs are moving and hiding in the leaf litter, and aerating the soil. Go over the mouthparts that they see, and the body parts that they are seeing. What body parts do kids have that are the same as the bugs? Students will want to tell you what they are seeing and identifying. Ask students to share with their friends at the table, and tell them which bugs they are finding.

### Let the Hunt Begin!

5. Ask students if they are enjoying finding and looking at bugs; which ones have they seen so far? Do they know what an “Entomologist” is? Explain that they are doing what an entomologist does sometimes, and that they study bugs every day in their laboratories.

Expect adult chaperones to have as much fun as the students.

## Wrap Up and Review

Tell students that you will be reviewing with them. If there is time, you can hand out the worksheets for them to write down their answers, or have the teacher take the worksheets to extend the learning in the classroom. Discuss the following:

- What do you know about leaf litter? What is it made up of?
- What do bugs do in the leaf litter?
- What kind of bugs did you see?
- What are the 5 body parts?
- What are the different ways bugs eat?
- What does an Entomologist do?
- How do insects communicate? (Their sounds, or antennae, or chemical scents)

## Lesson Extensions for Older Students

Have a quick discussion on what students think is a good bug (soldier bug, dragon fly, centipede, ladybug, black beetle) vs a bad bug (grasshopper, spotted asparagus beetle, leaf roller, grub, cutworm, squash bug, and crane fly) and what they could possibly do to the golf course turf.

Students can look through plastic tubs; identify the insect, check out the anatomy of each one. They can also figure out what “class” the insect is from.

- Millipedes (most have 30 or more pairs of legs)
- Centipedes (single pair of legs on each flat body segment)
- Crustaceans (Pill bugs / sow bugs have a tough exoskeleton that provides protection)
- Symphylum (tiny centipedes, with 12 pairs of legs) or insecta (insects, ants).

REMEMBER TO TAKE PICTURES. Permission forms are on the field trip page of our website.

## Additional Resources

If you’d like to purchase any of the resources listed below, see <http://www.thefirstgreen.org/resources-cited> for more information.

Reiley, H. Edward., and Carroll L. Shry. *Introductory Horticulture*, 7th Edition. Clifton Park, NY: Thomson Delmar Learning, 2007. Print.

Ingels, Jack E. *Ornamental Horticulture*, Thomson Delmar Learning, 2000. Print. ISBN-13: 9780766814172  
*Encyclopedia of Bugs*, by Miles Kelly Publishing. ISBN: 9781782094456

# Worksheet for Bug Lab

Date\_\_\_\_\_ Golf Course\_\_\_\_\_

Student Name\_\_\_\_\_

Please answer the questions below while participating in the learning lab.

1. Why are bugs important in our soil?
2. Why are bugs important to small mammals and birds?
3. What is leaf litter and how is it made?
4. What are the five bug parts?
5. What is the study of bugs called?
6. Describe how bugs eat.

Print, cut and laminate to make bug identification cards.



Pill Millipede  
(Rolybug)



Ant



Earwig



Centipede



Squash Bug



Millipede



Earthworm



Spittle Bug



Crane Fly

\*Missing Crane Fly Larve Picture

