

Unit 5 Lesson 1: Ladybugs to the Rescue

Focus Areas: Pest Control - Biological; Science, Math

Focus Skills: observing, comparing/contrasting, forming hypotheses, drawing conclusions

***Dedicated
to Reducing
Pesticides***

Objectives

- To identify insect body parts
- To identify predator/prey relationships that provide biological control of insect pests
- To recognize the diversity of life on the Earth

Essential Question

How can farmers and homeowners protect their crops and plants without using poisons to kill insect pests?

Essential Understandings

- Ladybird beetles are natural enemies of aphids, insects that kill plants.
- Ladybugs can control insect pests through natural predation.

Background

Aphids are tiny insect pests. They suck the sap from many types of plants such as vegetables, fruits, flowers, and trees. They take away the plant's nutrients and they can even give the plant viruses and diseases. Aphids attract even more pests to the plant with the sweet, sticky juices they make. Natural enemies that devour aphids by the hundreds include lacewings, assassin bugs, wasps, spiders and birds, such as the chickadee. However, the greatest gobbler of all is ladybugs, also known as ladybird beetles.

There are different varieties of ladybird beetles or ladybugs, as they are more commonly called. Both the male and female are called ladybugs. They are insects and have four life stages as part of their metamorphic development: egg, larva, pupa, and adult. Children love ladybugs and are fascinated by their appearance and friendliness. Few are aware of the important role they play in Integrated Pest Management (IPM).



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Background (continued)

These small insects are a vital tool to farmers who want to control insect pests, such as aphids, using a natural, biological control rather than synthetic chemicals and pesticides.

Ladybugs also have enemies such as birds. They protect themselves from these natural predators in a variety of interesting ways. First, the color red is a signal that they have a bad taste. Second, when a ladybug is in danger, it can send out a bad-smelling juice from its legs. The bad smell protects them so they will be left alone. Third, a ladybug protects itself from birds by dropping from a branch, rolling over and lying on its back. Because the underside is black, the bird can no longer see where the ladybug disappeared!



Vocabulary

aphid	a plant pest that sucks life juices from a host plant
cover wings	hard exoskeleton wings that protect the flying wings
flying wings	the insect parts that allow the insect to fly
host	a living thing that provides food for another living thing
juice	a liquid containing nutrients that living things need to survive
ladybug	a beneficial insect that preys upon aphids
leaves	the part of the plant that makes food
nutrients	vitamins and proteins a living thing needs to live and grow
predator	a living thing that hunts another living thing as a source of food



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Vocabulary (continued)

prey a living thing used by another living thing as a food source

suck to draw up liquid as through a straw

Logistics

Time: 30 minutes

Group Size: 5 to 30

Space: a classroom/outdoors

Materials



- *The Very Grouchy Ladybug* by Eric Carle *
- other science-related books about insects/ladybugs
- a clear plastic container with a lid for each pair of children or a glass terrarium for the class
- plant leaves and stems covered with aphids (Look on indoor plants and outside rose bushes and vegetable crops.) Aphids may also be ordered with the ladybugs or you may substitute commercially available ladybug food.
- a spray bottle to mist the plants daily
- a population of live ladybugs (See ordering information or collect ladybugs in spring and summer.)
- magnifying glasses or hand lenses for each two children
- art materials for creating lady bugs
- puffed rice cereal
- ladybug poster (flying and at rest, showing body parts) *
- Overhead 1 “*Aphid Counting Poem*” *

* single copy provided



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Preparation

1. Put the plants and stems in a container. Mist them lightly. Do not let water collect in the bottom of the container because the ladybugs can drown in **small** amounts of liquid. If you want to keep the plants in water so that you don't have to mist and replace them as frequently, fill a yogurt container one-third full of water, make a hole in the lid to push the plant stem through, and seal the top with the lid. This way the ladybugs won't fall in and drown.
2. If you are unable to obtain aphids or commercial food, refrigerating the ladybugs in the warmest place in a refrigerator will slow their metabolism so that they do not require food. Observe them and release them as soon as possible.
3. Obtain all the other materials as listed.

Activity

Introduction

1. Tell the children that there is a **very small** creature on the Earth that helps the leaves of plants in a **big** way! Tell them to listen as you describe it and raise their hand when they can name the insect that helps rescue leaves from harm.
 - a. It's about the size of your smallest fingernail.
 - b. It has black spots on its body.
 - c. Its body is red.
 - d. It has two antennae.
 - e. It has six legs.
 - f. It can fly high in the sky.
2. When the children have identified the ladybug, have them share any experiences they may have had with these fascinating friends of farmers. Tell them that some people think that if a ladybug lands on you it will bring good luck!

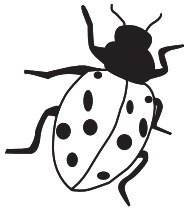


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Activity (continued)

Involvement

Part 1: Observing Ladybugs



1. Use the poster of a ladybug to count the three body parts (head, thorax and abdomen). Have the children count the six legs, two eyes, two antennae, and two pairs of wings. Ask the children why a lady bug needs legs, eyes, antennae and wings. (**legs:** movement on the leaves of the plant, **eyes:** to see, **antennae:** to feel and smell, **wings:** to fly)
2. Tell the group that ladybugs have two kinds of wings. The ones that are hard, red, and covered with spots are the **cover wings**. They cover the top of the ladybug to protect it. The other set of wings are the **flying wings**. These are the wings that actually allow the ladybug to fly. Ladybugs do this by moving their cover wings to the side to keep them out of the way. (Invite the children to watch lady bugs and observe them flying.)
3. Give each pair of children a container holding ladybugs and plant pieces or have the entire group observe a population of ladybugs in a larger terrarium. Posters and pictures from books could also be used.

Part 2:

1. Read Eric Carle's *The Grouchy Ladybug* that illustrates the prey/predator relationship between aphids and ladybugs as well as the diversity of life on the Earth.
2. Ask:
 - What insects were the ladybugs eating? (aphids, an insect pest)
 - Why didn't the grouchy ladybug want to share the aphids with the friendly ladybug? (He/She wanted them all to himself/herself.)
 - What excuse did the grouchy ladybug give for not fighting the yellow jacket, the stag beetle, the praying mantis, etc.? (They weren't big enough.)
 - When did the grouchy ladybug finally get some aphids to eat? (When the whale's tail flipped the ladybug right back to where it had started from)



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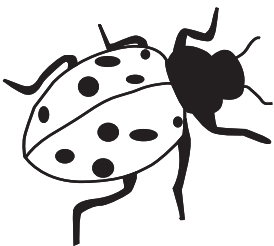
Involvement (continued)

Part 2:

- Why do you think there were still enough aphids left to share? (There can be hundreds or thousands on one plant. Aphids can reproduce very quickly.)
3. Show the children a real aphid or a picture. Explain that these tiny insect creatures are serious pests to farmers and gardeners. They suck the juice from the leaves of plants that may cause the leaves of the plant to die. Many of these plants are grown to be our food, so farmers have to find a way to protect their crops. Many farmers do not want to use sprays and chemicals. Ladybugs provide a natural way to control insect pests such as aphids without using poisons that can contaminate the soil and eventually the water. Ladybugs are heroes to plants. They help farmers grow healthy crops.
 4. Display Overhead 1, the “*Aphid Counting Poem*”, and recite it with the children, having them show the number used in each of the verses with their fingers.

Follow Up

1. Share illustrations from picture books that show other varieties of ladybugs, such as the brown ladybug with white spots or ladybugs that have no spots at all.
2. Read *Ladybug, Ladybug, Fly Away Home* (E.P. Dutton, New York, 1988) which tells of a ladybug’s journey home to find her children safely sleeping.
3. Provide art materials and have the children create their own ladybugs. Have them describe the features and explain why it is a helpful insect.
4. Collect smooth, round stones and have the children paint them to resemble ladybugs and remember how they help the Earth.





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Follow Up (continued)

5. Play the **Ladybugs Love Aphids Game**. Define an imaginary garden area, either inside or outside the classroom. Scatter the aphids (puffed rice) there. Tell the children they will become hungry lady bugs and capture aphids to eat. When you say “Go”, the ladybugs (the children) have to collect as many aphids (puffed rice pieces) as they can. Any aphids that are left when you call “Time” will multiply to be three times that many. For example, if seven aphids are left on the field or rug, they will multiply to be 21. As each successive round goes by, shorten the time the ladybugs have to eat their prey. You could also add more ladybugs to the game in the same way that farmers release more ladybugs into the fields to combat the growing infestations of aphids and other insect pests.



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Notes

