

# Lost Ladybugs

## About the 4-H Science Toolkit Series: Lost Ladybugs

Some species of native ladybugs in North America are disappearing. In just the last 20 years, these beneficial predators of farm and garden pests have become extremely rare. This rapid decline is of great concern.

In completing this series of units, both age groups will learn about:

- Insect life cycles and the food web
- Biological control of insect pests
- The importance of biodiversity and the process of sampling
- Building their own sweep net
- Searching for, capturing, cataloguing and storing insects
- Submitting data to the Lost Ladybug Project

Students from both age groups will contribute to real scientific inquiry, and begin to explore their own scientific research questions.

All of these adventures call on students to predict what will happen, test their theories, then share their results. They'll be introduced to ladybug vocabulary, gain an understanding of the life cycles of ladybugs and their importance in the food web and collect bugs themselves to identify, observe and report about to the Lost Ladybug Project.

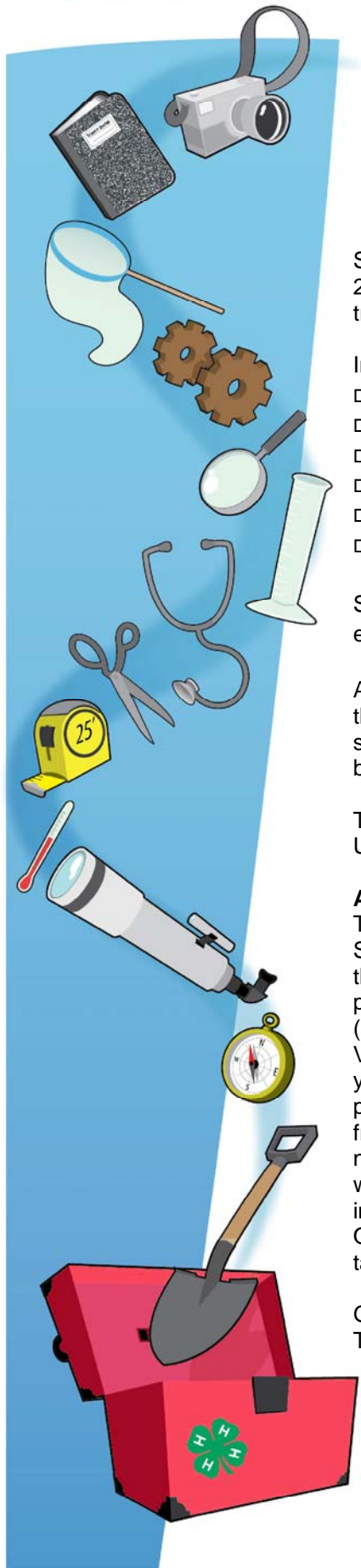
The lessons in this unit were developed by the Lost Ladybug Project based at Cornell University in the Department of Entomology.

### About the project:

The Lost Ladybug Project was set in motion at a small number of schools in New York State in 2004. Now it is active in many states in the U.S. It is a citizen science project that asks anyone of any age to look for any ladybugs they can find, and then send in pictures of each one. One of the first major discoveries came in 2006 when Jilene (age 11) and Jonathan (age 10) Penhale found a rare nine-spotted ladybug near their Virginia home. This was the first nine spotted ladybug seen in the eastern U.S. in 14 years. Their finding confirmed that the species was not extinct and that with enough people working together we can find even these rare species. With recent funding from the National Science Foundation the Lost Ladybug Project has expanded and now anyone in North America can participate. Both common and rare ladybugs, whether native or introduced, are important to find. They all contribute to understanding where different species of ladybugs can be found and how rare they really are. Once we know where the rare ladybugs can be found, we can try to protect their habitat and save them!

General information about ladybugs and their life cycle are on the following pages. This information may be useful for the activities as well.

To find out more about the Lost Ladybug Project, visit [www.lostladybug.org](http://www.lostladybug.org). To find numerous resources related to the insects, outdoor exploration and the environment, check out the 4-H Resource Directory at [www.cerp.cornell.edu/4h](http://www.cerp.cornell.edu/4h).



# All About Ladybugs

## What are ladybugs?

Ladybugs are insects in the Coccinellidae family of the beetle order, Coleoptera. They are characterized by their oval-shaped body and distinctive coloring.

## Is there a difference between lady beetles and ladybugs?

Although these insects are commonly called “ladybugs,” they are members of the beetle order, Coleoptera. The Coleoptera are unique from other orders in that they undergo complete metamorphosis (that is, have larva and pupa stages in their life cycle), and their forewings have modified into a hardened cover (elytra) that protects the insect. “True” bugs belong to the order Hemiptera, and include boxelder bugs, plant bugs, and squash bugs.



### Immature True Bug

Though taxonomically incorrect, lady beetles are still commonly referred to as ladybugs. Other frequently used common names are ladybirds or ladybird beetles.

## How did ladybugs get their name?

The most common legend as to how ladybugs got their name is that during the middle ages in Europe, swarms of aphids were destroying crops. The farmers prayed to the Virgin Mary for help – and help came in the form of ladybugs that devoured the plant-destroying pests and saved the crops! The grateful farmers named these insects “Our Lady’s beetles,” a name which had endured to present day.

## What do ladybugs eat?

Both adult and larval ladybugs are known primarily as predators of aphids but they also prey on many other soft-bodied insects and insect eggs. Many of these are agricultural pest such as scale insects, mealybugs, spider mites and eggs of the Colorado Potato Beetle and European Corn Borer. A few ladybugs feed on plant and pollen mildews and many ladybugs supplement their meat diet with pollen.

### What eats ladybugs?

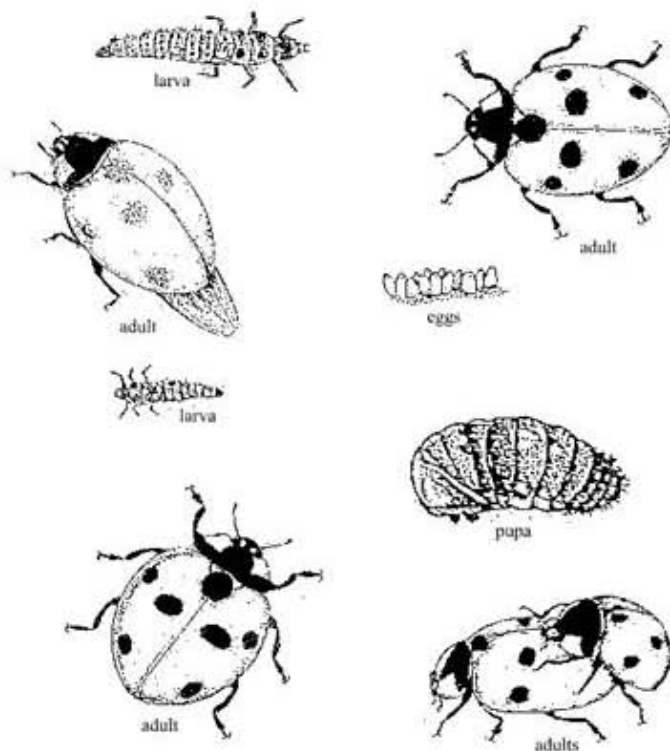
Ladybugs are not commonly eaten by birds or other vertebrates, who avoid them because they exude a distasteful fluid and commonly play dead to avoid being preyed upon. However, several insects, such as assassin bugs and stink bugs, as well as spiders and toads may commonly kill lady beetles.

### How many different species are there in the US? In the world?

There have been over 500 species of ladybugs identified in the United States, and over 4500 in the entire world.

### How long do they live?

After a female lays her eggs, they will hatch in between three and ten days, depending on ambient temperature. The larva will live and grow for about a month before it enters the pupal stage, which lasts about 15 days. After the pupal stage, the adult ladybug will live up to one year.



### What do the different stages of the life cycle look like?

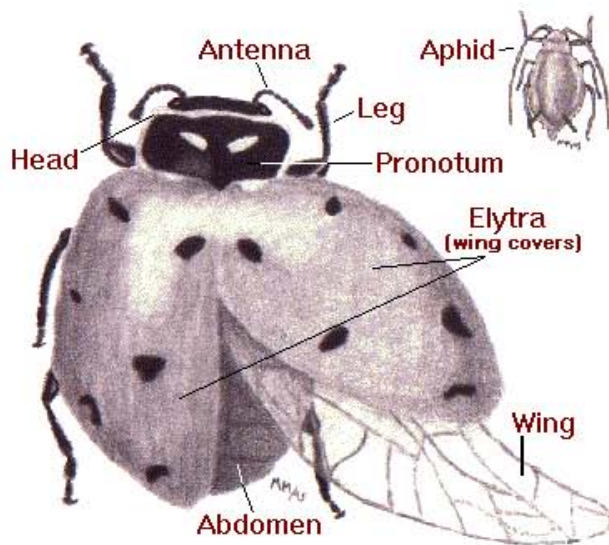
#### Life Cycle Stages

**Eggs** are tiny, spindle-shaped, and arranged in clusters.

**Larvae** are usually elongated, "alligator" shaped, slightly pointed at the rear, and their body is covered in tiny bristles.

**Pupae** are slightly round and dark colored. You can find them attached to a surface by their hind ends.

**Adults** are sphere-shaped, smooth, and have easily recognizable colors and markings.



**What about ladybug anatomy?**

### Ladybug Anatomy

**Ladybug in Flight**  
 Photo by Alex Wild, Champaign, Illinois, 2008



**Why are they so brightly colored?**

Ladybugs bright colors serve as a warning – they indicate any potential predators of the distasteful repellents the beetle will release if attacked. Ladybug spots are part of the bright warning pattern discussed in the previous question.

**What's with them in my house during winter?**

During the winter months, ladybugs seek out a warm place to hibernate. Many seek out cracks around buildings, including people's homes. They mass together to stay warm throughout the winter. Don't worry, they will not harm you or any part of your home, and they will be gone by spring.

**How did non-native species get here?**

Non-native ladybug species may have been introduced to the United States by scientists as an attempt to control crop-damaging aphids, or they could have hitched a ride with any vegetation that was brought over from Europe, Africa, or Asia.

## Lost Ladybug Project: Ladybug Life Cycle

**Activity Series:**

Lost Ladybug

**Grade:** K-2

**Time:** 45 min.

### Main Idea

Ladybugs, like all beetles, undergo complete metamorphosis. The four life stages of beetles look extremely different. Both immature and mature ladybugs prey on small soft-bodied insect prey, which are often agricultural pests.

### Motivator

A single ladybug larva will eat about 400 medium-size aphids during its development to the pupal stage. An adult female will eat about 300 medium-size aphids before she lays eggs. She can eat about 75 aphids in a day and may consume more than 5,000 aphids in her lifetime!

### Pre-Activity Questions

Before you start the activity, ask the students:

- Have you all seen ladybugs? Did you know that they are beetles?
- Do you know what ladybug babies look like?
- Did you know that ladybugs use their antennae to touch, smell, and taste?

### Activity: Create ladybugs

- Green felt or construction paper
- Packing peanuts
- Toilet paper rolls
- Black pipe cleaners
- Empty egg cartons
- Masking tape
- Scissors
- Stapler
- Yellow paint
- Red and black markers or paint
- Hole punch
- Glue
- Printed photos of real ladybug eggs, larvae, pupae and adults from [www.lostladybug.org](http://www.lostladybug.org)

#### To make ladybug EGGS:

1. Cut the green felt or construction paper into the shapes of leaves.
2. Cut the rounded ends off of the packing peanuts and glue the flat sides of these (approximately 10 - 20) close together on the leaves.
3. Paint the rounded eggs yellow.

### Objectives

- Learn about the ladybug life cycle.
- Understand what ladybugs eat

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
- Build/Construct
- Use tools
- Observe
- Communicate
- Organize
- Infer
- Question
- Plan Investigation
- Summarize
- Invent
- Interpret
- Categorize
- Model/Graph
- Troubleshoot
- Redesign
- Optimize
- Collaborate
- Compare

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[www.lostladybug.org](http://www.lostladybug.org)

# Lost Ladybug Project: Ladybug Life Cycle

## To make ladybug LARVAE:

1. Make slits half way up from one end of the toilet paper rolls.
2. Make ½ inch slits in the other side of the toilet paper rolls.
3. Shape the slit ends into cones and fasten with masking tape.
4. Make six legs by feeding three black pipe cleaners through holes punched in the uncut portion of the toilet paper rolls.
5. Use markers or paint to make eyes on the blunt end and color the entire form dark.

## To make ladybug PUPAE

1. Cut green felt or construction paper into the shapes of leaves.
2. Separate individual cups from an egg carton.
3. Using markers or paint, children can paint the egg carton cups yellow and black or a muddy mixture like brown.
4. With tape, attach the cups, open part down, to the leaves. If the artists have designed one end of the cup to be more like a head, then the pupae should be attached opposite to this.

## To make ADULT LADYBUGS

1. Separate individual cups from an egg carton.
2. Using markers or paint, children can paint the egg carton cups red or yellow or orange. Then, using black paint, color about a quarter of the outside of the cup. This will be the ladybug pronotum. The true ladybug head would hardly be visible but can be envisioned at the very front of this. Children can draw a vertical line down the ladybug body (abdomen) and make symmetrical spots on either side of that line.
3. Using the point of a scissors or a hole punch, an adult should make six small holes (three on each side) at the base of the cup near along the front half of the cup. These will be for the legs. Make two small holes (for antennae) at the very front where the head will be.
4. Insert a black pipe cleaner into each side hole and out the other side for the legs. Use half a pipe cleaner for the antennae.

## Science Checkup - Questions to ask to evaluate what was learned

(note: there are answers in the intro to this series if needed)

- Are ladybugs "bugs" or "beetles"?
- Ladybug larvae and adults have legs. What about the pupae?
- Do ladybug larvae and ladybug adults eat the same things?
- Can you think of some other "predators" and other "prey"?

## Extensions

### Play the game "Plant, Plant, Ladybug!" (Duck, Duck, Goose!)

This game reinforces the roles of ladybugs as predators and aphids as likely prey and was invented by a 9-year-old student in one of the first groups collaborating with the Lost Ladybug Project in 2008. Everyone sits in a circle except for one aphid who walks around designating "plant, plant, plant" until she calls someone a ladybug! The ladybug gets up and the chase is on! If the ladybug catches the aphid, the aphid must sit in the middle and the ladybug becomes the next aphid, and so on until the ladybugs have

# Lost Ladybug Project: Ladybug Life Cycle

## Vocabulary

**Ladybug:** A small round flying beetle that has red or orange outer wings with black spots

**Lady beetle:** Another name for a ladybug.

**Egg:** A large cell produced by birds, fish, insects, reptiles and amphibians that includes a fertilized embryo that continues to develop outside the mother's body until it hatches.

**Larva:** The wingless immature worm-shaped form of many insects.

**Pupa:** An insect at the stage between a larva and an adult in complete metamorphosis.

**Complete metamorphosis:** A stage during which the insect is in a cocoon or case stops feeding, and undergoes internal changes

**Predator:** An animal that eats other animals in order to survive.

**Prey:** An animal caught, killed and eaten by another animal as food.

## Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)

## Lost Ladybug Project: Ladybug Diversity

**Activity Series:**  
Lost Ladybug  
**Grade:** K-2  
**Time:** 45 min.

### Main Idea

Ladybugs can be found all over the world and there are many different species. Learn to recognize important characteristics.

### Motivator

There are more than 4,500 species of ladybugs in the world and more than 500 identified in the U.S. Only about 70 of these are the cute red, yellow and black ones we think of most.

### Pre-Activity Questions

Before you start the activity, ask the students:

- Do all ladybugs look alike?
- What colors do they come in?
- About how many kinds do you think you might find in one place?

### Activity 1: Drawing, modeling ladybugs

- Large ladybug poster (download from [www.lostladybug.org](http://www.lostladybug.org)) (optional)
- Ladybug field guides (download from [www.lostladybug.org](http://www.lostladybug.org))
- Blank paper or ladybug outlines (download from [www.lostladybug.org](http://www.lostladybug.org))
- Crayons, markers, or paints

1. Have children pick a ladybug from the poster or Field Guide to draw freehand, fill in on a ladybug outline sheets or model with clay or play dough.
2. Talk about how ladybugs look: identify body parts; colors of wings, head, antenna; color, size, shape, number and placement of spots. Then compare to other ladybugs.

### Activity 2: Ladybug Bingo

- Ladybug bingo chips (can be made of paper, felt, or anything)
- Up to 30 different ladybug bingo game boards (download from [www.lostladybug.org](http://www.lostladybug.org))

1. Give each child a ladybug bingo game board and discuss the differences and names of the ladybugs.



### Objectives

- Learn to identify ladybugs
- See why insect variety is important

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
- Build/Construct
- Use tools
- Observe
- Communicate
- Organize
- Infer
- Question
- Plan Investigation
- Summarize
- Invent
- Interpret
- Categorize
- Model/Graph
- Troubleshoot
- Redesign
- Optimize
- Collaborate
- Compare

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2. Cut up a few other game boards for pieces to pull out of the hat, and cut up something for chips.
3. Have a great game and learn about ladybugs at the same time!

## Science Checkup - Questions to ask to evaluate what was learned

(note: there are answers in the intro to this series if needed)

- Are all ladybugs red?
- Do the patterns of both the wings (or elytra) and the pronotum vary?
- Where do introduced ladybugs come from?

## Extensions

Ways to demonstrate that a variety of insects do a variety of jobs

- Gather a toolbox or bag containing different tools. "Here are different tools that people use to do different jobs. Here's a hammer for hammering nails, here's a screwdriver for screwing into wood, a measuring tape for making accurate measurements. "(Hold up a hammer) So the hammer is good for pounding nails. Why don't we just have lots of hammers? Why don't we fill our toolbox with just hammers? Why do we need all these different tools? Each tool does a different job. We need all the tools in order to do lots of different things. Each insect also does a different job, so we need different kinds of insects, not just bees or just beetles."
- Ask participants to think of different jobs that people do in their community.

Each ladybug species lives best, and eats the most pests, in specific circumstances. One way of expressing this is that they each have their own "job" like tools in a toolbox. This understanding will help students make sense of biodiversity and conservation.

## Vocabulary

**Elytra:** A tough front wing, occurring in pairs on beetles and some other insects, that acts as a protective covering for the rear wing.

**Rare:** Rare plants and animals are not commonly found.

**Common:** Common plants and animals can be easily found.

**Native species:** Native species are plants or animals that were original to a specific place

**Introduced species:** Introduced species are brought into a new habitat from another location. They are not original to the area.

**Biodiversity:** The range of organisms present in a particular ecological community or system.

**Conservation:** The preservation, management, and care of natural and cultural resources.

## Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)

## Lost Ladybug Project: Getting Ready to Collect

**Activity Series:**  
Lost Ladybug  
**Grade:** K-2  
**Time:** 45 min.

### Main Idea

Prepare a ladybug collection chart and make a good strong sweep net for collecting in the next unit.

### Motivator

If ladybugs fall from a plant or fall into your net, they may play dead! Watch them closely!

### Pre-Activity Questions

Before you start the activity, ask the students:

- What are the differences between a butterfly net and a sweep net?
- How many different kinds of ladybugs do you think you will find?

### Activity: Making a homemade sweep net

- Pillow cases
- Two wire coat hangers / pillow case
- One piece of wood or dowel approx 2 - 3 feet long for a handle
- Scissors
- Duct tape
- Pliers
- One piece of poster board
- Crayons or markers

1. Turn your two wire hangers into similar circles. Then tape them together in several places, leaving the open end opened.
2. Now cut holes on either side of the seam where there are two layers of pillowcase fabric. Feed the wire through the pillowcase hem. Straighten out the ends that are left so that they can be taped to the handle
3. Heavily tape the four wire pieces that are out of the pillowcase to the handle. Make sure it is sturdy because it's going to bump into thick grass, alfalfa, clover and other plants!
4. Set up a poster board chart like this, with different ladybug species at the top.

Species	Species A	Species A	Species A	Species A	Species A
Date, location	#	#	#	#	#

### Objectives

- Create a sweep net
- Learn to organize ladybug data

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
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- Use tools
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- Plan Investigation
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- Invent
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- Categorize
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- Troubleshoot
- Redesign
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- Compare

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## Lost Ladybug Project: Getting Ready to Collect

5. The students can draw the different species of ladybugs again or cut them out from either the bingo game boards or field guides they have seen before. (Either can be downloaded from [www.lostladybug.org](http://www.lostladybug.org))
6. After each collection (next two units) the students will record the dates and habitats and numbers of each type of ladybug they found. At the end of the fifth unit, or during the sixth unit, these can be compared!

### Science Checkup - Questions to ask to evaluate what was learned

- Now that you have looked at several different kinds of ladybugs, is it getting easier to identify them?
- Are you ready to go outside and find them?

### Extensions

Check out the Lost Ladybug Coloring Book on the [www.lostladybug.org](http://www.lostladybug.org) Web site for a great story of the project, with pictures for children to color.

### Vocabulary

**Sweep net:** A strong net without holes for collecting insects.

**Species:** A basic biological classification and containing individuals that resemble one another and may interbreed

### Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)

## Lost Ladybug Project: Collecting

**Activity Series:**  
Lost Ladybug  
**Grade:** K-2  
**Time:** 45 min.

### Main Idea

Go outside and collect ladybugs to see what kinds you find and how many. All ladybugs are important to the Lost Ladybug Project and help scientists figure out where different species are – both rare and common varieties. The children become citizen scientists themselves!

### Motivator

Some ladybugs are found alone while others are found in huge groups of thousands. Some are swept out of the air and wash ashore beside large lakes!

### Pre-Activity Questions

Before you start the activity, ask the students:

- What do you think makes a good habitat for ladybugs?
- What kind of weather or what time of day do you think would be best for collecting ladybugs?
- How many different species do you think you will find? (some answers to the first question can be found below)

### Activity: Collecting

- Your own sweep nets
- Your poster board chart
- Large plain cloth or sheet
- High-sided wash basin or box
- Jars, vials, or ziplock bags
- Cooler w/ cold pack or ice

First, locate a collecting site(s). In general, the best sites will be areas of more than 100 square meters (120 yards) that contain herbaceous (not woody or tough) plants that are at least 20 cm (8 in) high. Plants that are too tough cannot easily be swept through and plants that are too short do not host many of the prey insects that ladybugs need, so they don't usually support very large populations of ladybugs.

Collecting sites could include: any area that has not been mowed recently, preferably with some weeds, plants at the edge of a wooded area, mowed area or field (e.g. a hedgerow). Or orchards are also a possibility. Sweeping is possible if not too recently mowed.

Trees themselves are excellent habitat for ladybugs, and while they clearly cannot be swept, lower branches can be shaken or

### Objectives

- Learn to efficiently collect a sample from the field
- Learn to identify ladybugs

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
- Build/Construct
- Use tools
- Observe
- Communicate
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- Troubleshoot
- Redesign
- Optimize
- Collaborate
- Compare

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## Lost Ladybug Project: Collecting

beaten vigorously onto sheets. Note that many orchards are treated frequently with insecticides, so be sure to check on the treatment schedule.

Agricultural fields such as alfalfa, clover, small grains like wheat, potatoes and soybeans can make fruitful collecting sites. As with orchards, be sure to check with the grower first.

1. If you will be comparing ladybugs from two different habitats (two consecutive units), you should know that keeping ladybugs in a refrigerator for more than one week is not great for their health. If your group meets once each week, the best plan would be to search for the same length of time, say ½ hour, each time and allow time for photographing the ladybugs on the second week. So, if one habitat is farther from headquarters, that would be the place to go during this unit!
2. Demonstrate back and forth motion of the net, sweeping low enough to knock insects into the net but not hit the ground, or show video clip from the [lostladybug.org](http://lostladybug.org) Web site. In addition to the insects that will be knocked off the plant, many insects leap for the ground when disturbed and will hopefully land in your nets.
3. Let everyone go out and sweep, search and beat for a defined period of time.
4. Empty sweep nets onto open sheets or into wash basins and boxes.
5. Collect all ladybugs into jars, vials or bags.
6. Try to identify which species have been found!
7. Put the ladybugs into a cooler until you reach a refrigerator. Keep them with a small bit of damp paper towel or cotton until they can be photographed (next unit). Cooling slows insects down and makes it easier for them to go without food.

### Science Checkup - Questions to ask to evaluate what was learned

(note that there are answers in the intro to this series if needed)

- How many ladybugs did you find?
- How many different species did you find?
- How many different ladybug species did you recognize?
- Did you find them all in the same kind of habitat?

### Extensions

Find out more about the ladybugs you have found so far at [www.lostladybug.org](http://www.lostladybug.org)

### Vocabulary

**Habitat:** The natural conditions and environment in which a plant or animal lives, e.g. forest, desert, or wetlands

**Microclimate:** the climate of a confined space or small geographic area

**Sampling:** Taking a small part, number, or quantity of something as a sample and using it to make observations about the whole group or area.

### Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)

## Lost Ladybug Project: Collecting-Part 2

**Activity Series:**  
Lost Ladybug  
**Grade:** 3-6  
**Time:** 45 min.

### Main Idea

Go outside and collect ladybugs again and compare results from two different habitats. For the Lost Ladybug project, having repeat collections from nearby locations and by the same "spotters" is especially valuable. The children become SUPER citizen scientists themselves!

### Motivator

We still don't know why certain ladybugs live on certain plants and in certain areas. Let's try to learn more about this.

### Pre-Activity Questions

Before you start the activity, ask the students:

- How and why do you think your second ladybug collection may be different from your first?
- How many different species do you think you will find?

### Activity: Collecting at a new site

- Your own sweep nets
- Your poster board chart
- Large plain cloth or sheet
- High-sided wash basin or box
- Jars, vials, or ziplock bags
- Cooler w/ cold pack or ice
- Camera (preferably digital with a close-up function.
- Printed page of "the perfect grey" (downloaded from [www.lostladybug.org](http://www.lostladybug.org))

Locate a second collecting site, somehow different in habitat than the first. The difference could be related to what surrounds the fields (surrounding vegetation versus neighborhood housing) or differences in the fields themselves (types of plants, etc.). Note recommendations from "Collecting."

1. If you will be comparing ladybugs in two different habitats (two consecutive units), this time you should plan to go out fast and come back with time to take photographs.
2. Gather your sweep nets, cloths, wash basins, jars and cooler. Go out and sweep, search and beat for a defined period of time.
3. Empty sweep nets onto open sheets or into wash basins and boxes.
4. Collect all ladybugs into jars, vials or bags.
5. Put the second collection of ladybugs into a chilled cooler. Cooling will slow them down and make them easier to photograph.
6. Once back at headquarters, while the second group of ladybugs cools down, you can photograph the first (pre-cooled)

### Objectives

- Learn differences between habitats
- Learn to store and photograph insects

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
- Build/Construct
- Use tools
- Observe
- Communicate
- Organize
- Infer
- Question
- Plan Investigation
- Summarize
- Invent
- Interpret
- Categorize
- Model/Graph
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## Lost Ladybug Project: Collecting-Part 2

collection of ladybugs. To do this, bring out your print of "the perfect grey." This grey background will help avoid the glare that can come off shiny ladybug elytra and make identification more difficult. Glare or reflection off the beetle is often more of a problem than not having enough light.

7. Place one chilled ladybug at a time on the grey background and take the largest photograph you can, while maintaining focus. Shield the beetle from bright light and use the flash only if there is very little light.
8. As this is happening, someone in the group should be recording the group's "best guess" as to the species of each ladybug being photographed.
9. Repeat the process with the now chilled newer group of ladybugs and record the "best guesses" separately.
10. Once all the ladybugs have been photographed, you are ready to fill in your poster board chart and have an interesting discussion! In the upper half, note the date, time, number of "spotters," habitat and numbers of each ladybug species found, as well as "kinds" you may not know the names of yet. You may recognize them as all belonging to the same species even if you don't yet know the name. (This is fine! You do not need to determine the species you find. The Lost Ladybug Project will receive the photo and determine the species.)
11. Fill in the lower half of the chart with similar data from this day's collection. Discuss how and why your collections from two different habitats may have been similar or different.
12. Return the ladybugs to where you found them or to another great ladybug habitat.

### Science Checkup - Questions to ask to evaluate what was learned

(note that there are answers in the intro to this series if needed)

- On which day did you find more ladybugs?
- On which day did you find more species of ladybugs?
- If you found differences, do you think they may be due to habitat, date or weather?
- How many different ladybug species did you NOT recognize?

### Extensions

- Think of all the ways your two collecting expeditions differed. Do you have any ideas about where or when you can expect to find more ladybugs?
- Find out more about the ladybugs you have found so far at [www.lostladybug.org](http://www.lostladybug.org).

### Vocabulary

**Habitat:** The natural conditions and environment in which a plant or animal lives, e.g. forest, desert, or wetlands

**Microclimate:** the climate of a confined space or small geographic area

**Sampling:** Taking a small part, number, or quantity of something as a sample and using it to make observations about the whole group or area.

### Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)

Find this activity and more at: <http://nys4h.cce.cornell.edu>

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## Lost Ladybug Project: Submitting your Data

**Activity Series:**  
Lost Ladybug  
**Grade:** K-2  
**Time:** 45 min.

### Main Idea

Complete the process of giving your ladybug images to the Lost Ladybug Project and begin to explore how your data relates to all the other data collected for the Lost Ladybug Project.

### Motivator

Lost Ladybug project received more than 1,000 ladybug photo submissions in 2008. We would love to receive 10 times that many in 2009 and 100 times that many in 2010! Your data is important to us!

### Pre-Activity Questions

Before you start the activity, ask the students:

- How and why do you think your two ladybug collections were or were not different?
- Do you think your collections were similar or different from collections in other parts of North America?

### Activity

*Note: This activity involves one person at a computer and may be best suited for a few members to submit data at a time.*

- A computer with online access
- The camera with the ladybug photos in it
- Your data from the two collection times

1. Download your ladybug photos from your camera and submit them online through [www.lostladybug.org](http://www.lostladybug.org) by following instructions. You will be asked for the names and ages and number of "spotters." You will be asked for date, time, habitat data as well as the length of time spent searching, etc.
2. Congratulations citizen scientists!
3. If you have time, you can access the currently submitted data to the Lost Ladybug Project through [www.lostladybug.org](http://www.lostladybug.org). You can ask and even map questions like:  
 Where have all the \_\_\_\_\_ species been found so far?  
 Where have all the native ladybugs been found so far?  
 Where have all the exotic ladybugs been found so far?  
 In what month of 2008 were the most \_\_\_\_\_ species found?  
 In what habitats were \_\_\_\_\_ species found in 2008?

### Supplies

### Objectives

- Learn how to submit data to the project
- See the bigger picture of ladybug diversity across the U.S.

### Learning Standards

(See Matrix)

### Common SET Abilities 4-H projects address:

- Predict
- Hypothesize
- Evaluate
- State a Problem
- Research Problem
- Test
- Problem Solve
- Design Solutions
- Develop Solutions
- Measure
- Collect Data
- Draw/Design
- Build/Construct
- Use tools
- Observe
- Communicate
- Organize
- Infer
- Question
- Plan Investigation
- Summarize
- Invent
- Interpret
- Categorize
- Model/Graph
- Troubleshoot
- Redesign
- Optimize
- Collaborate
- Compare

### Contributed By

The Lost Ladybug Project  
[www.lostladybug.org](http://www.lostladybug.org)

# Lost Ladybug Project: Submitting your Data

## Science Checkup - Questions to ask to evaluate what was learned

- How did your collections compare with the ladybugs already submitted to the Lost Ladybug Project?
- Did you find about the same proportion of native and introduced species?
- Did you find any of the newly rare species? Can you tell from the data in the Lost Ladybug Project where you might expect to find them?
- Be sure to keep in mind that all ladybugs provide good information to scientists. Without pictures of all the ladybugs you find they will not be able to tell how common the common species are or, in turn, how rare the rare ones are.
- Which of your collections had greater species richness?
- Which of your collections had greater species evenness?

## Extensions

Test your own ladybug hypotheses using the mapping and graphing features found at [www.lostladybug.org](http://www.lostladybug.org).

## Vocabulary

Native species: Native species are plants or animals that were original to a specific place

Introduced species: Introduced species are brought into a new habitat from another location. They are not original to the area.

## Background Resources

- [www.lostladybug.org](http://www.lostladybug.org)