

Education Module: Beneficial Pests - The Ladybug

Age Target: 6-8

Overview: This module is designed for younger grades as the activities are geared towards a younger audience. It introduces kids to the ladybug – a ‘good bug’ which can be a part of an integrated pest management system. Kids learn general facts about the ladybug (interesting facts, anatomy, and life cycle) as well as how some bugs can actually help farmers with their crop production. Colour pictures show the different variety of ladybugs that exist around the world. Two activities are included – ladybug word search and a craft where they create a ladybug vest they can wear.

This module introduces children to pest management systems on the farm in a fun and friendly way.

Includes:

- Fact Sheet: Interesting Ladybug facts
- Fact Sheet: How ladybugs help farmers
- Fact Sheet: Ladybug Anatomy
- Fact Sheet: Life cycle of a Ladybug
- Fact Sheet: Habitat and Survival
- Fact Sheet: Fun Facts
- Fact Sheet: Colour Pictures of Ladybugs
- Display Sheet: Colour Pictures of Ladybugs
- Activity: Becoming a Ladybug
- Activity: Ladybug word search
- Feedback Form

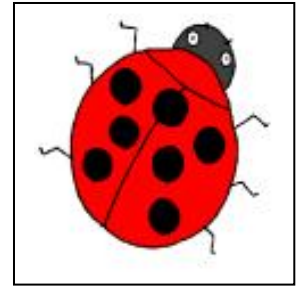
Instructor Requirements:

- Large, grocery-size paper bags
- Scissors
- Red and Black crayons, markers or pencil crayons
- Seedless Green Grapes for “aphid” snack

For more information about the benefits of integrated pest management, please visit www.croplifecanada.ca/foodforthought. This site contains an interactive game – Farmer Frank’s Farming Challenge – which lets kids become a farmer grow their own online crop.



Ladybug Facts



- Ladybugs are really a type of beetle and are a very beneficial group of insects.
- Even the males are considered to be ladybugs.
- There are over 4,500 different kinds of ladybugs worldwide. 400 of them can be found in North America.
- Two-spotted and seven-spotted varieties are often seen in Canada.
- Aphids (small green bugs that harm crops) are a ladybug's favourite food.
- A single ladybug can eat as much as 5,000 aphids in its lifetime.
- Ladybugs chew from side to side and not up and down like people do.
- Ladybugs make a chemical that smells and tastes terrible so that birds and other predators won't eat them.
- The spots on a ladybug fade as the ladybug gets older.
- The male ladybug is usually smaller than the female.
- Ladybugs can produce a distinctly felt nip!
- The Asian Lady Beetle can live up to 2-3 years if the conditions are right.

How ladybugs help farmers



Ladybugs are not only cute—they are useful! During the spring and summer, nearly all ladybugs feed on destructive, plant-eating insects (especially aphids). During its lifetime a single ladybug may consume as many as 5,000 aphids.

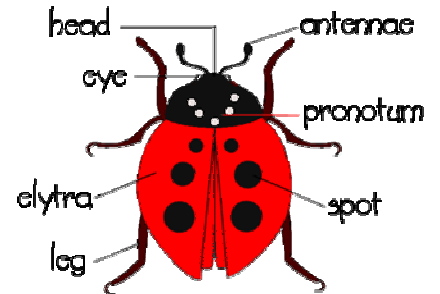
Ladybugs lay their eggs on plants infested with aphids or scale insects, on which the larvae feed until they pupate in the remains of the last larval skin. Adult ladybugs gather in large numbers in the fall, prior to winter hibernation, and are often collected at that time by farmers for use in pest control.

The first outstanding demonstration of pest control by use of natural enemies occurred in the United States in 1889, when Australian ladybugs were imported to wipe out the cottony-cushion scale, an insect that had accidentally been imported from Australia to California and there became a threat to citrus orchards.

The Mexican bean beetle (*Epilachna varivestis*), which has spread through E North America, and the squash beetle (*E. borealis*) are the only North American ladybird beetles (ladybugs) considered destructive. They are yellowish with black spots and the adults and larvae feed on plants.

Ladybug Anatomy

Ladybugs are mostly under 1/4 in. (6 mm) long and are round or oval in shape, with very short legs. They are usually red or yellow with black spots, or black with red or yellow spots, the common species differing only in the number of spots. They have a bitter taste, and their bright coloration is thought to serve as a warning to predators.



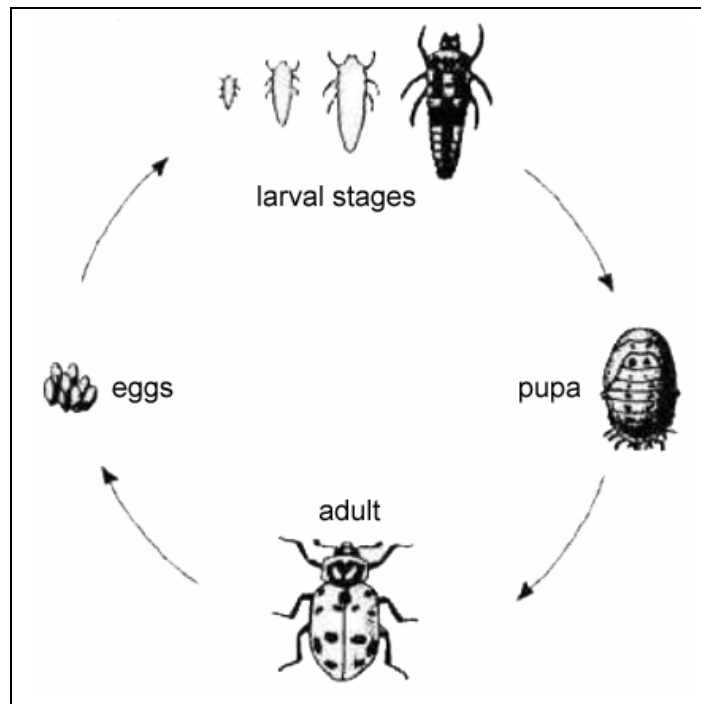
All ladybugs have six jointed legs which have special organs on their feet to help them smell. They have two eyes and see light and dark but no colours. Ladybugs possess one pair of antennae which they use to smell, touch and taste.

A ladybug has a three-part body consisting of the:

- **head** (which has the mouthparts, compound eye, and antennae)
- **thorax** (the middle section which is where the 3 pairs of legs and the pairs of wings attach)
- **abdomen** (which holds the excretory and reproductive organs and most of the digestive system)

Ladybugs have a hard casing (elytra) on their back to protect their inner wings which they use to fly. Ladybugs are also symmetrical which means that each side of their body is a mirror image of the other side.

Life cycle of a Ladybug



Adult females lay their eggs (usually in groups of 10-20) in the vicinity of aphid colonies. The eggs are usually yellow or orange in colour and hatch within 3-5 days.

The larvae that hatch from the eggs are spiny and black with bright spots. Although they look dangerous, the larvae are quite harmless to humans. And the larvae also eat aphids--even more than the adults.

After two to four weeks the larva attaches itself to a leaf, and enters the pupa stage. The pupa then metamorphosis into the adult ladybug. For the first 24 hours as an adult ladybug, they often don't have their spots.

There may be as many as six generations of ladybugs hatched in a single year!

Ladybugs: Fun Facts

More than 100 years ago, people in Europe thought that ladybugs could help them in many different ways.

In Austria, people used to ask the ladybug for good weather.

In Switzerland, people told their children that human babies were brought by ladybugs.

People in northern Germany counted spots on the backs of ladybugs. Fewer than seven meant a big harvest.

People in Central Europe believed that, if a girl caught a ladybug and it crawled across her hand, she would be married within a year.

Names around the world

The ladybug has different names in countries around the world:

China: Flower Lady

Iraq: Water Delivery-Man's Daughter

India: Indra's Cowherd

Iran: Good news

Switzerland: Lord God's Little Fatty

Italy: Vacchette della Madonna

France: Creatures of the Good God

France: Cows of the Virgin

Germany: Mary's Beetles



Ladybugs: Habitat and Survival

Habitat

Lady beetles live in a wide variety of habitats. Trees, shrubs, fields, beaches, and even houses are good places to look for them. Since many are very tiny, they escape notice and one good method of finding them is by "sweeping". This involves passing an insect net through grassy areas or low shrubbery with sweeping motions. After several sweeps are taken, examine the contents of the net. In appropriate areas this will frequently turn up many lady beetles.

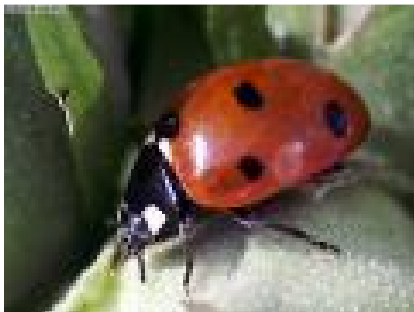
Protection from Predators

Ladybugs have some interesting means of protection. Their red or orange and black coloration warns birds that they would not make a very tasty meal. Birds learn that insects that are red and black or yellow and black usually sting or taste bad and hence they leave such insects alone.

Ladybugs are able to reflex-'bleed' from their leg joints. The blood is yellow, with a strong repellent smell which discourages predators. They also will "play dead" when in danger. Many predators will not eat an insect that doesn't move.

The larva of lady beetles is a rather fearsome looking creature. It is somewhat alligator-shaped and covered with bumps and spines. In most species the larva is a fierce predator which you might guess if you look at its pincer-shaped jaws. Despite the small size of the creature, it can produce a distinctly felt nip on one's finger if handled.

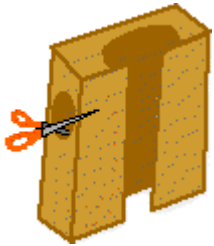
Pictures of Ladybugs



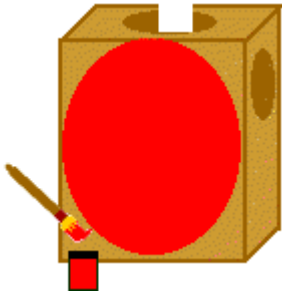
Being a Ladybug

Supplies needed:

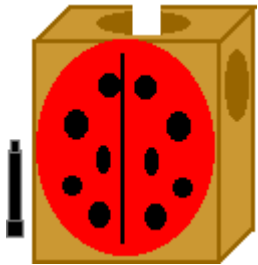
- 1 large paper grocery bag
- Scissors
- Red and black crayons, markers or pencil crayons



Cut a large paper grocery bag open along the seam (this will be the back of the vest). Then cut a neck hole in what was the bottom of the bag. Cut an arm hole on each side of the bag.



Draw a large red circle on the front on the bag.



Draw a black line down the center of the circle and draw black spots on both sides.

You now have a ladybug vest.

Ladybug Word Search



B K W A W W C M H M S L D Z G
D E C L A D Y B U G E U I X A
W G A A N S Q J Y A L F H B R
P W X N L D H I V H T V P V D
C Z A Y N B E E U Q E Y A Y E
P K I M H E S O C W E I K S N
N O I T C E T O R P B C R S R
E A V R A L L N J Q U E C U U
W H F I O Z G P A L M X R D N
D I I X H R H Q F R P K O D B
X J N Z M N U D A U D R P K L
B P T G I X B F W T L R M A E
P Y Q N S H Z K S M E J Q B H
Q F S P O T S J L D F M X C P
L Z M Y E L Z U T S P B X T K

Words to Search For:

ANTENNAE
APHID
BEETLES
BLACK
CROP
FARMERS
GARDEN
HELPFUL

LADYBUG
LARVAE
LEAVES
LUCKY
PROTECTION
RED
SPOTS
WINGS

We would appreciate your assistance as we work to improve current and create materials for educational use across Canada.

Did you use this module?

- Yes
- Yes, but adapted some of the materials
- No

If you did not use the material, why not?

- Received it too late
- Was not applicable to the age group I was teaching
- Did not find the topics interesting
- The module was too short
- The module was too long
- The module took too long to prepare for

How useful was this module?

- Very User Friendly
- User Friendly
- Not User Friendly

Was the information in the module age appropriate?

- Yes
- No

Did the kids find the information and activities interesting?

- Yes
- No

Was there the right mix between academic material and interactive activities?

- Yes
- No
- Not Applicable

Which comments do you think apply to the design of the module?

- I like it
- Simple to understand
- Not enough graphics
- The copy on pages needs to be easier to understand
- Professional
- Needs more bells and whistles
- Boring
- Needs to be more scientific
- Needs to be more interactive

Any other comments you would like to share?

Please either fax back to 416-482-2292 or mail to:

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