

Data Collection
Scientific Background

During an experiment, scientists typically make measurements and collect results as they work. This information, known as *data*, can take many forms. Data may be a set of numbers, written notes, or even maps or drawings generated during an experiment. Scientists use tables, charts, graphs, and notebooks to record data. It is important to accurately record all relevant data, even data that seems surprising or wrong. Anomalies, or inconsistent or surprising findings in the data, may be analyzed and explained later.

Close-up pictures for each of the Level 1 bugs and a Science Journal page can be used to provide opportunities for students to practice their data collection skills. Students will make observations and collect data about the bugs using words and pictures. This data will be used to compare, contrast, sort, and classify the insects.

Vocabulary

This is the vocabulary for each of the nine Level 1 Backyard Bugs.

Antlion Larva	abdomen, jaws, larva
American Cockroach	abdomen, adapted, cerci, jointed
Dragonfly	adult, compound eyes, veins, wings
Hickory Horned Devil	caterpillar, prolegs, thorax
Luna Moth	adult, antennae, feathery, female, scales, wings
Monarch Butterfly	adult, antennae, female, knobbed, nectar, proboscis, scales, wings
Monarch Caterpillar	caterpillar, prolegs, true legs
Spider	cephalothorax, claws, eyes, fangs, prey, venom
Whirligig Beetle	eyes, hind legs, paddle-like

*Vocabulary definitions can be found in the **Backyard Bugs Glossary**.*

Thinking Question

What does the data you collected tell you about the bug you are investigating?

Exploratory and Extension Activities

Additional Exploratory and Extension activities are available in the Backyard Bugs Teacher’s Guide.

Data Gathering Activity

Have the students find everyday examples of data around their classroom or in their home. Some examples of data are: lists of spelling words, phone numbers, test scores, attendance records, calendars marked with birthdays or other events, and photographs of classmates or family members.

State Symbols

Students will understand how knowing a state's symbols, such as its motto, seal, flower, nickname, flag, bird, tree, song, fish, gem, dance, ship, folk song, fruit, grass, tartan, insect, and fossil, is a great way to get a basic understanding of that state—its geography, sociology, natural resources, flora, fauna.

Visit <http://www.enchantedlearning.com/usa/states/> to investigate the insect selected as the state symbol for each of the states. Have students use a political map to create a mosaic of the state insect symbols for their region of the United States.

Bug Multiplication

Discuss one of the insects you investigated that has three body parts, such as the cockroach. Ask how many parts does one insect have? (3) How many body parts would you have if you had two insects? Proceed with this for the multiplication tables for three. This can be done for multiplication tables for six, using the insect's three pairs of legs.

Name: _____

Data I Collected About _____

Draw a picture of the bug you collected data for.



How long is the bug?	
How many legs does the bug have?	
Does the bug have wings?	
What does the bug eat?	

Answer Key

Data I Collected About _____

Draw a picture of the bug you collected data for.

Students should draw the bug they are investigating.

Use the table to assess how students have represented the bug's features.

Bug Name	How long is the bug?	How many legs does the bug have?	Does the bug have wings?	What does the bug eat?
<i>Antlion larva</i>	<i>1 cm</i>	<i>3 pairs</i>	<i>Larva – No Adult – Yes, 2 pairs</i>	<i>Larva – eats ants and other small insects Adult – various</i>
<i>American Cockroach</i>	<i>5 cm</i>	<i>3 pairs</i>	<i>Yes, 2 pairs</i>	<i>Scavenger – eats dead organic material</i>
<i>Dragonfly</i>	<i>10 cm wingspan</i>	<i>3 pairs</i>	<i>Yes, 2 pairs</i>	<i>Carnivore – eats other insects</i>
<i>Hickory Horned Devil – Regal Moth</i>	<i>10 cm</i>	<i>3 pairs of true legs and 5 pairs of prolegs</i>	<i>Hickory Horned Devil – No Regal Moth – Yes, 2 pairs</i>	<i>Hickory Horned Devil – eats leaves Regal Moth – does not eat</i>
<i>Luna Moth</i>	<i>11 cm wingspan</i>	<i>3 pairs</i>	<i>Yes, 2 pairs</i>	<i>Caterpillar – eats leaves Adult – does not eat</i>
<i>Monarch Butterfly</i>	<i>10 cm wingspan</i>	<i>3 pairs</i>	<i>Yes, 2 pairs</i>	<i>Sips nectar from flowers</i>
<i>Monarch Caterpillar</i>	<i>5 cm</i>	<i>3 pairs of true legs and 5 pairs of prolegs</i>	<i>No</i>	<i>Eats milkweed plant leaves</i>
<i>Spider</i>	<i>11 cm</i>	<i>3 pairs</i>	<i>No</i>	<i>Insects and other small animals</i>
<i>Whirligig Beetle</i>	<i>1 cm</i>	<i>3 pairs</i>	<i>Yes, 2 pairs</i>	<i>Carnivore – eats other insects Scavenger – eats dead organic material</i>

<p>How long is the bug?</p>	<p><i>Use the table above to assess student's responses to this question.</i></p>
<p>How many legs does the bug have?</p>	<p><i>Use the table above to assess student's responses to this question.</i></p>
<p>Does the bug have wings?</p>	<p><i>Use the table above to assess student's responses to this question.</i></p>
<p>What does the bug eat?</p>	<p><i>Use the table above to assess student's responses to this question.</i></p>
<p><i>Use this answer area to have students write a question.</i></p>	<p><i>Use this answer area to have students write an answer to the question they wrote.</i></p>