
Insects, Spiders and Other Arthropods



First-Grade Teacher Resource Guide

Table of Contents

Lesson summary	1
Vocabulary	1
Life Cycle Activity	2
Extension Activities	3
Education Standards	4-5

Insects, Spiders and Other Arthropods: Lesson Summary and Vocabulary

Lesson Summary: The YSI *Insects, Spiders & Other Arthropods* program allows students to touch and examine samples of the arthropod phylum while learning about their characteristics and development. The presentation focuses on both instructor-led discussion and hands-on activities. Students will work as a group to assemble an insect and spider, observing the functions and variations in each body part. Discussion will continue as the instructor presents live examples, covering the arthropods' physical adaptations, diets, habitats, and roles both in nature and with humans. Students will learn about the insect life cycle and get a chance to touch and interact with mealworms in each stage of their metamorphosis. Throughout the program, students will be challenged to use their critical thinking skills to answer a wide range of open-ended questions and expand their understanding of insects and the arthropod phylum as a whole.

Vocabulary: Below are words and concepts that relate to the *Insects, Spiders & Other Arthropods* program.

Abdomen: the large third body part of an insect (and the second of a spider); contains organs

Antennae: the sensing organs of insects; used to listen, taste, feel, smell, and communicate

Arachnid: an arthropod with two body parts and eight legs; includes spiders and scorpions

Arthropod: an animal with an exoskeleton and jointed legs

Camouflage: something (such as color or shape) that protects an animal from attack by making the animal difficult to see in the area around it

Cephalothorax: the first body part of an arachnid; houses brain and attaches to limbs

Decomposer: an animal that feeds on dead matter and breaks it down into simpler compounds

Environment: the sum of everything that surrounds animals and humans in the natural world, including the air, the water, and the soil

Exoskeleton: the shell or external skeleton that supports and protects an arthropod's body

Habitat: the natural environment of a plant or animal

Insect: an arthropod with six legs and three body parts; more than half of the organisms on earth

Larva (Entomology): the wingless, feeding stage of an insect that undergoes complete metamorphosis

Metamorphosis: insect life cycle; development from larva to pupa to adult

Nymph (Entomology): the young of an insect that does not undergo complete metamorphosis, usually differs from the adult in that it is smaller and does not have wings

Pedipalps: extra frontal appendages or "arms" of a spider or other arachnid

Predator: an animal that hunts and eats other animals

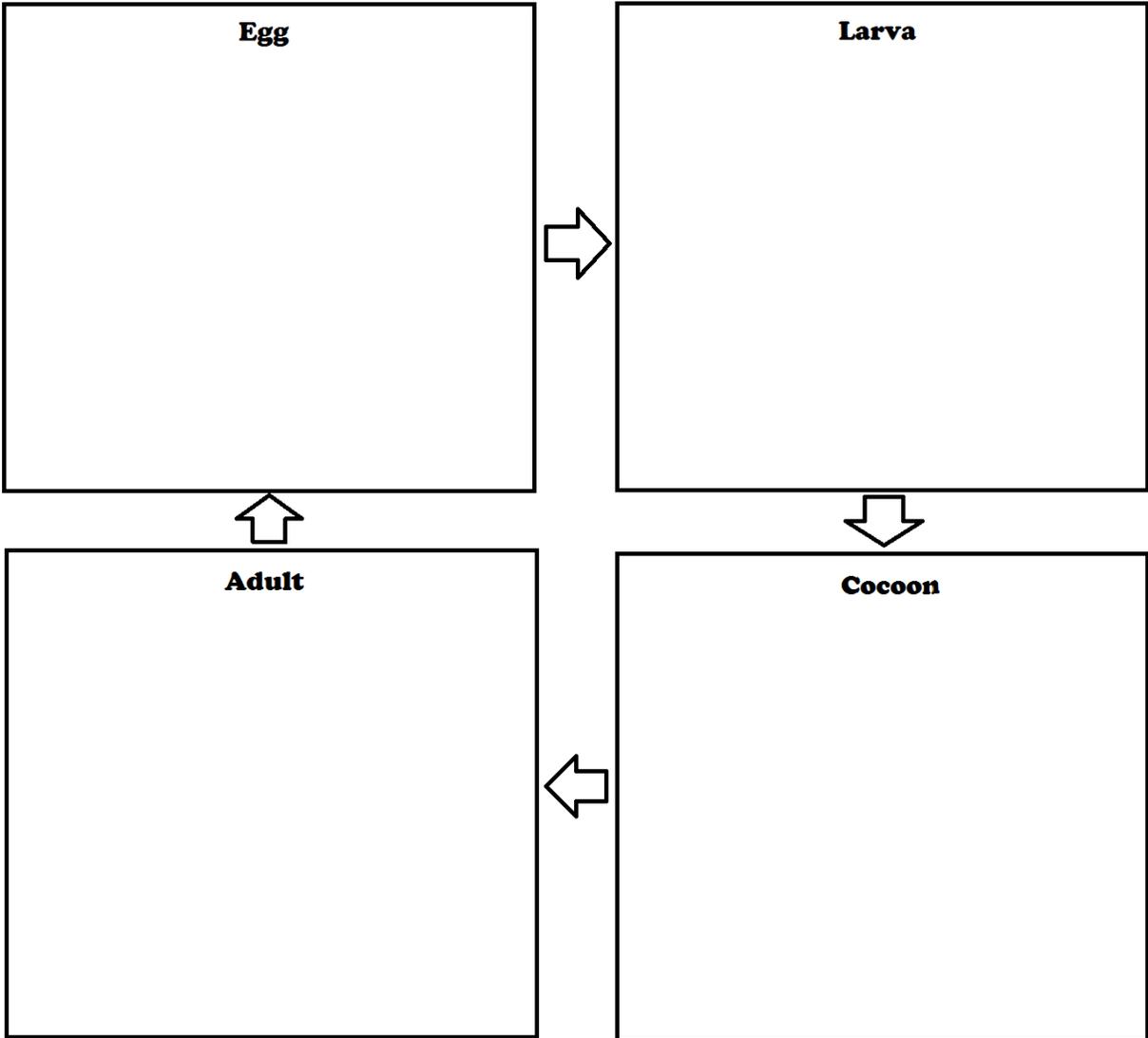
Pupa: an insect in the non-feeding, usually immobile, transformation stage between the larva and the adult

Spider: the most common type of arachnid; spins webs and has fangs

Thorax: the second or middle body part of an insect, attaches to limbs and sometimes wings

Insects, Spiders and Other Arthropods: Life Cycle Activity

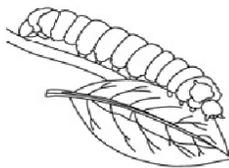
Draw the four life stages of a butterfly!



Here are some pictures to help you get started!



Egg



Larva



Cocoon



Adult

Insects, Spiders and Other Arthropods: Extension Activities

The extension activities listed below are from RAFT (Resource Area For Teaching). RAFT educational content is available online (www.raftbayarea.org) at no cost and is aligned to California Science Standards and Next Generation Science Standards. Below is a selection of post-visit activities from RAFT to extend student learning about insects and arthropods.

[RAFT Idea: Bug Pooter – RAFT Bay Area](#)

Grades Covered: K through 10

Subjects Covered: Life Science

Curriculum topics: Arthropods; Observation; Classification; Insects

Description: A safe, humane way to collect and observe small creatures...

<http://www.raftbayarea.org/ideas/Bug%20Pooter.pdf>

[RAFT Idea: Camouflage – RAFT Bay Area](#)

Grades Covered: K through 12

Subjects Covered: Life Science

Curriculum topics: Natural Selection, Ecosystems, Probability, Design.

Description: Learn how coloration helps animals hide from predators...

<http://www.raftbayarea.org/ideas/Camouflage.pdf>

[RAFT Idea: Folded Flutterbys – RAFT Bay Area](#)

Grades Covered: K through 4

Subjects Covered: Life Science, Art

Curriculum topics: Art, Butterflies, Shapes

Description: Create a butterfly shape from two diagonally folded squares...

<http://www.raftbayarea.org/ideas/Folded%20Flutterbys.pdf>

Insects, Spiders and Other Arthropods: Education Standards

The following pages cite California Science Content Standards, Common Core Standards, and Next Generation Science Standards which students will be exposed to during the program.

California Science Content Standards First Grade:

Life Sciences: 2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:

- a. *Students know* different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.
- b. *Students know* both plants and animals need water, animals need food, and plants need light.
- c. *Students know* animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

Excerpted from CA State Standards: <http://www.cde.ca.gov/>

Common Core First Grade:

Speaking and Listening Standards: Students will...

1. Participate in collaborative conversations with diverse partners about grade 1 topics with peers and adults in small and larger groups.
 - a. Follow agreed-upon rules for discussions.
 - b. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
 - c. Ask questions to clear up any confusion about the topics under discussion.
2. Ask and answer questions about key details from information presented orally.
Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.

Excerpted from Common Core Standards: <http://www.corestandards.org/>

Next Generation Science Standards First Grade:

Structure, Function, and Information Processing

- **1-LS3-1:** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
 - **Science and Engineering Practices:**
 - **Constructing explanations and designing solutions:** Builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.
 - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)
 - **Disciplinary core ideas:**
 - **LS3.A: Inheritance of Traits:** Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)
 - **LS3.B: Variation of Traits:** Individuals of the same kind of plant or animal are

Insects, Spiders and Other Arthropods: Education Standards

recognizable as similar but can also vary in many ways. (1-LS3-1)

- **Crosscutting Concepts:**
 - **Patterns:** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)

Other topics covered:

- **Disciplinary core ideas:**
 - **LS1.A: Structure and Function:** All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)
 - **LS1.D: Information Processing:** Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)
- **Crosscutting Concepts:**
 - **Structure and Function:** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

Excerpted from NGSS: <http://www.nextgenscience.org/>