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# Insects, Spiders and Other Arthropods



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## Kindergarten Teacher Resource Guide

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## **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

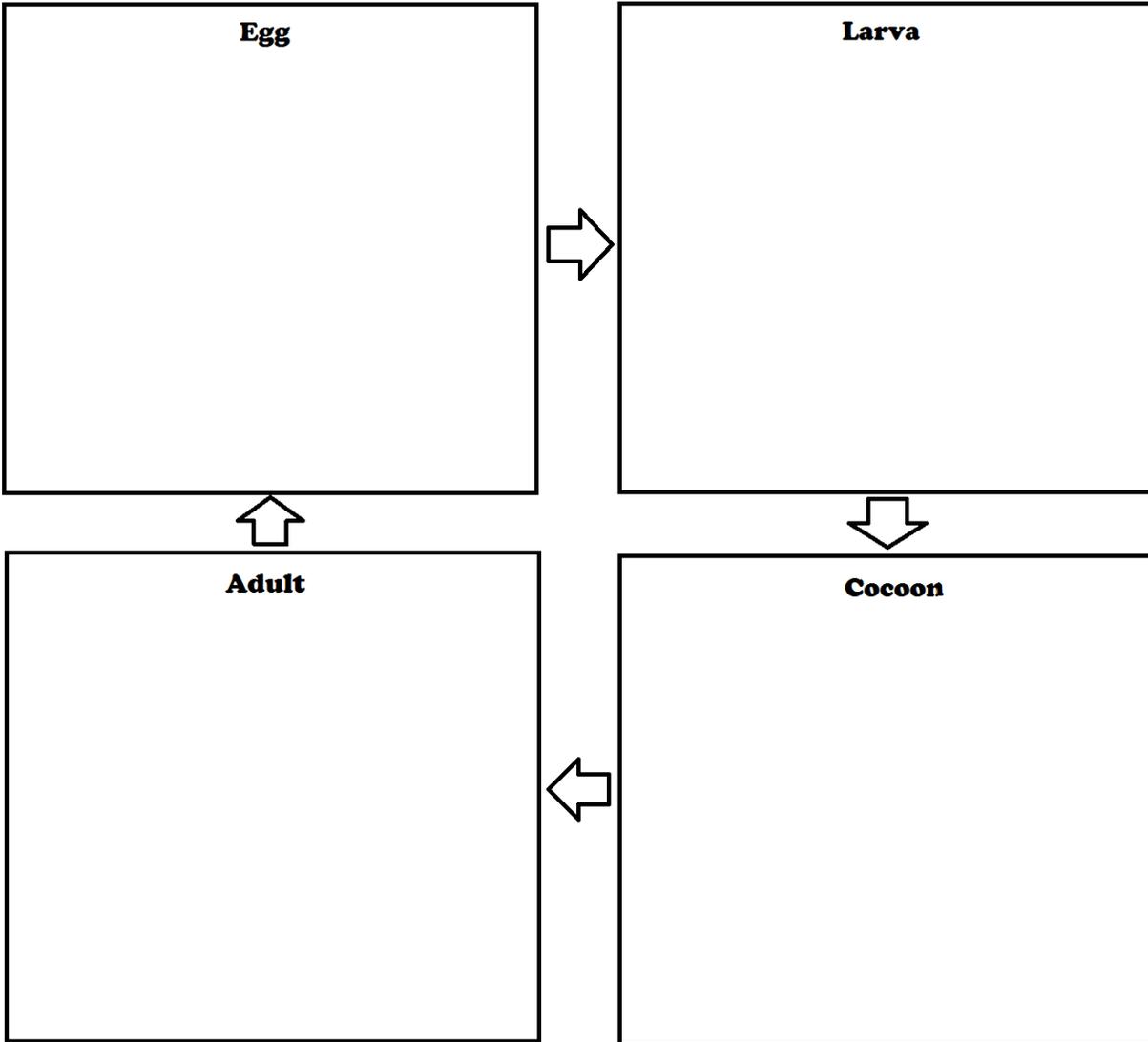
**Pupa:** an insect in the non-feeding, usually immobile, transformation stage between the larva and the adult

**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

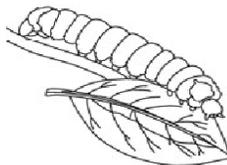
Draw the four life stages of a butterfly!



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](http://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 Kindergarten:**

**Physical Sciences: 1.** Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:

- a. *Students know* objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).

**Life Sciences: 2.** Different types of plants and animals inhabit the earth. As a basis for understanding this concept:

- a. *Students know* how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).
- b. *Students know* stories sometimes give plants and animals attributes they do not really have.
- c. *Students know* how to identify major structures of common plants and animals (e.g. stems, leaves, roots, arms, wings, legs).

**Investigation and Experimentation: 4.** Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

- a. Observe common objects by using the five senses.
- b. Describe the properties of common objects.
- d. Compare and sort common objects by one physical attribute (e.g. color, shape, texture, size, weight).

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

### **Common Core Kindergarten:**

**Speaking and Listening Standards:** Students will...

1. Participate in collaborative conversations with diverse partners about kindergarten topics with peers and adults in small and larger groups.
  - a. Follow agreed-upon rules for discussions.
  - b. Continue a conversation through multiple exchanges.
2. Confirm understanding of information presented orally by asking and answering questions and requesting clarifications.
3. Ask and answer questions about what a speaker says in order to seek help, gather additional information, or clarify something that is not understood.

## Insects, Spiders and Other Arthropods: Education Standards

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

### Next Generation Science Standards Kindergarten:

#### Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

- **K-LS1-1:** Use observations to describe patterns of what plants and animals need to survive.
  - **Science and Engineering Practices**
    - **Analyzing and Interpreting Data:** builds on prior experiences and progresses to collecting, recording, and sharing observations.
    - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)
    - **Scientific Knowledge is Based on Empirical Evidence:** Scientists look for patterns and order when making observations about the world. (K-LS1-1).
  - **Disciplinary Core Ideas**
    - **LS1.C: Organization for Matter and Energy Flow in Organisms:** All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)
  - **Crosscutting Concepts**
    - **Patterns:** Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)
- **K-ESS2-2:** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
  - **Science and Engineering Practices**
    - **Engaging in Argument from Evidence:** Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).
    - Construct an argument with evidence to support a claim. (K-ESS2-2)
  - **Disciplinary Core Ideas**
    - **ESS2.E: Biogeology:** Plants and animals can change their environment. (K-ESS2-2)
    - **ESS3.C: Human Impacts on Earth System:** Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2)
  - **Crosscutting Concepts**
    - **Systems and System Models:** Systems in the natural and designed world have parts that work together. (K-ESS2-2)

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