
Insects, Spiders and Other Arthropods



Fourth-Grade 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

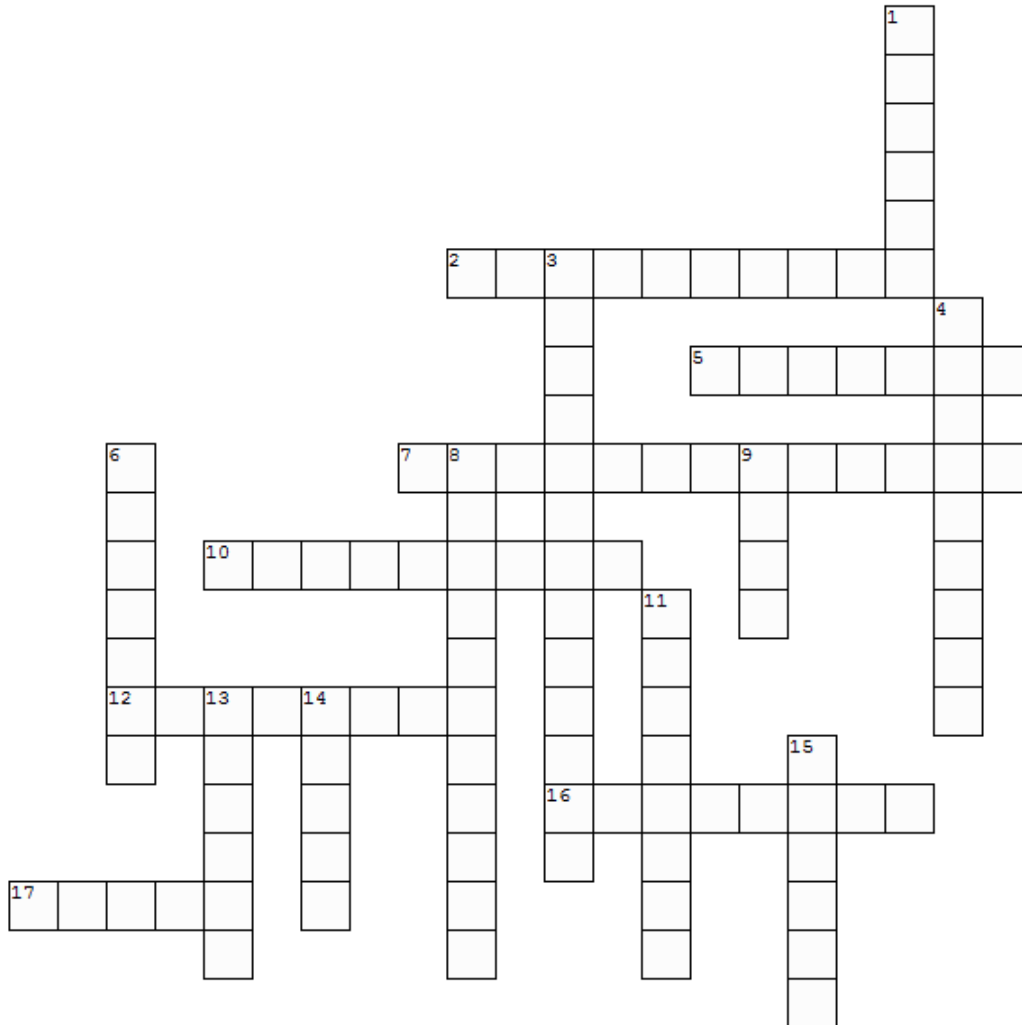
Predator: an animal that hunts and eats other animals

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

Language Arts Crossword Puzzle Insects and Arthropods



ABDOMEN	ANTENNAE	ARACHNID	ARTHROPOD	CEPHALOTHORAX	
DECOMPOSER	EXOSKELETON	HABITAT	INSECT	LARVA	METAMORPHOSIS
NYMPH	PEDIPALPS	PREDATOR	PUPA	SPIDER	THORAX

Across

2. An animal that feeds on dead matter and breaks it down into simpler compounds.
5. The large third body part of an insect (and the second of a spider); contains organs.
7. Insect life cycle; development from larva to pupa to adult.
10. An animal with an exoskeleton and jointed legs.
12. The sensing organs of insects; used to listen, taste, feel, smell, and communicate.
16. An arthropod with two body parts and eight legs.
17. The wingless, feeding stage of an insect that undergoes complete metamorphosis.

Down

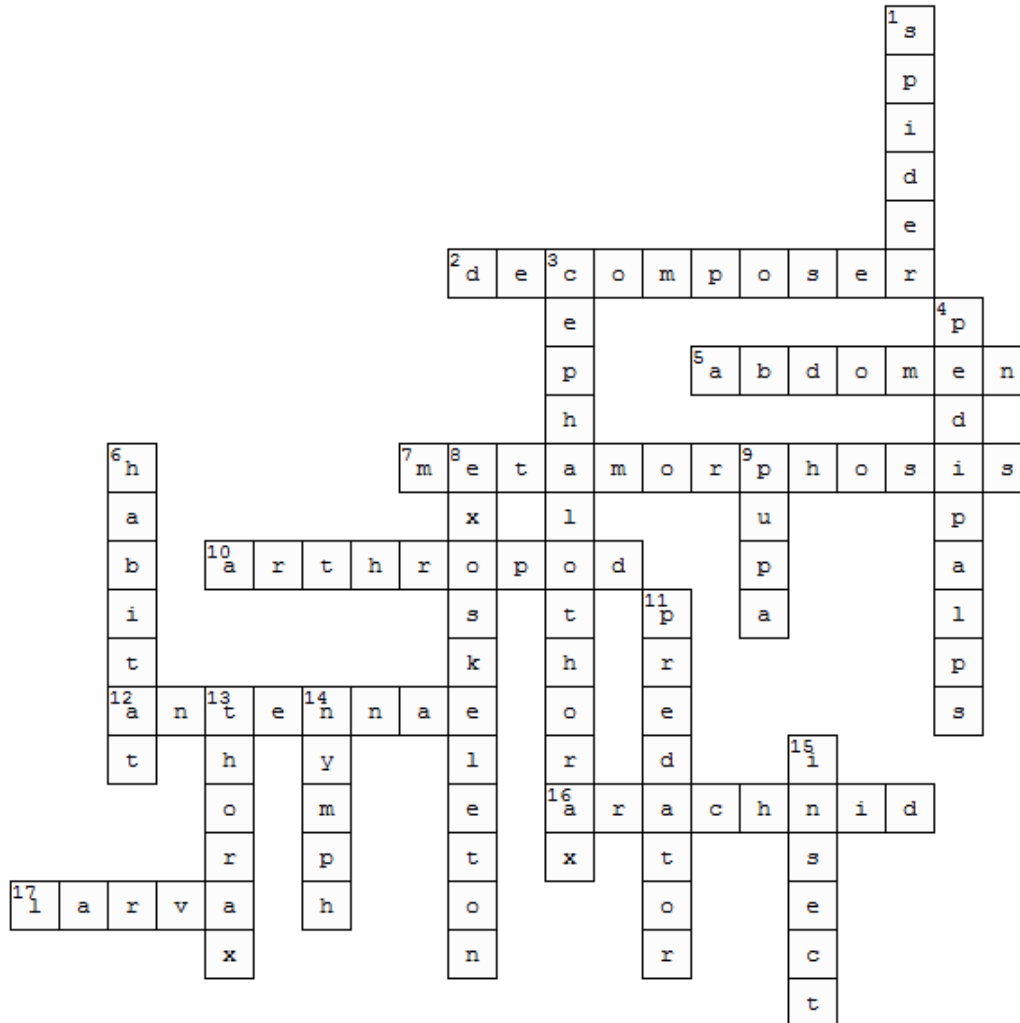
1. The most common type of arachnid; spins webs and has fangs.

3. The first body part of an arachnid; houses the brain and attaches to the limbs.
4. The extra frontal appendages or “arms” of a spider or other arachnid.
6. The natural environment of a plant or animal.
8. The shell or external skeleton that supports and protects an arthropod’s body.
9. An insect in the non-feeding, usually immobile, transformation stage between the larva and the adult.
11. An animal that preys on other animals to survive.
13. The second or middle body part of an insect, attaches to limbs and sometimes wings.
14. 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.
15. An arthropod with six legs and three body parts; more than half of the animals on earth.

Answer Key

Language Arts Crossword Puzzle

Insects and Arthropods



Across

2. An animal that feeds on dead matter and breaks it down into simpler compounds. (**decomposer**)
5. The large third body part of an insect (and the second of a spider); contains organs. (**abdomen**)
7. Insect life cycle; development from larva to pupa to adult. (**metamorphosis**)
10. An animal with an exoskeleton and jointed legs. (**arthropod**)
12. The sensing organs of insects; used to listen, taste, feel, smell, and communicate. (**antennae**)
16. An arthropod with two body parts and eight legs. (**arachnid**)
17. The wingless, feeding stage of an insect that undergoes complete metamorphosis. (**larva**)

Down

1. The most common type of arachnid; spins webs and has fangs. (**spider**)
3. The first body part of an arachnid; houses the brain and attaches to the limbs. (**cephalothorax**)
4. The extra frontal appendages or “arms” of a spider or other arachnid. (**pedipalps**)
6. The natural environment of a plant or animal. (**habitat**)
8. The shell or external skeleton that supports and protects an arthropod’s body. (**exoskeleton**)
9. An insect in the non-feeding, usually immobile, transformation stage between the larva and the adult. (**pupa**)
11. An animal that preys on other animals to survive. (**predator**)
13. The second or middle body part of an insect, attaches to limbs and sometimes wings. (**thorax**)
14. 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. (**nymph**)
15. An arthropod with six legs and three body parts; more than half of the animals on earth. (**insect**)

Language Arts Word Search

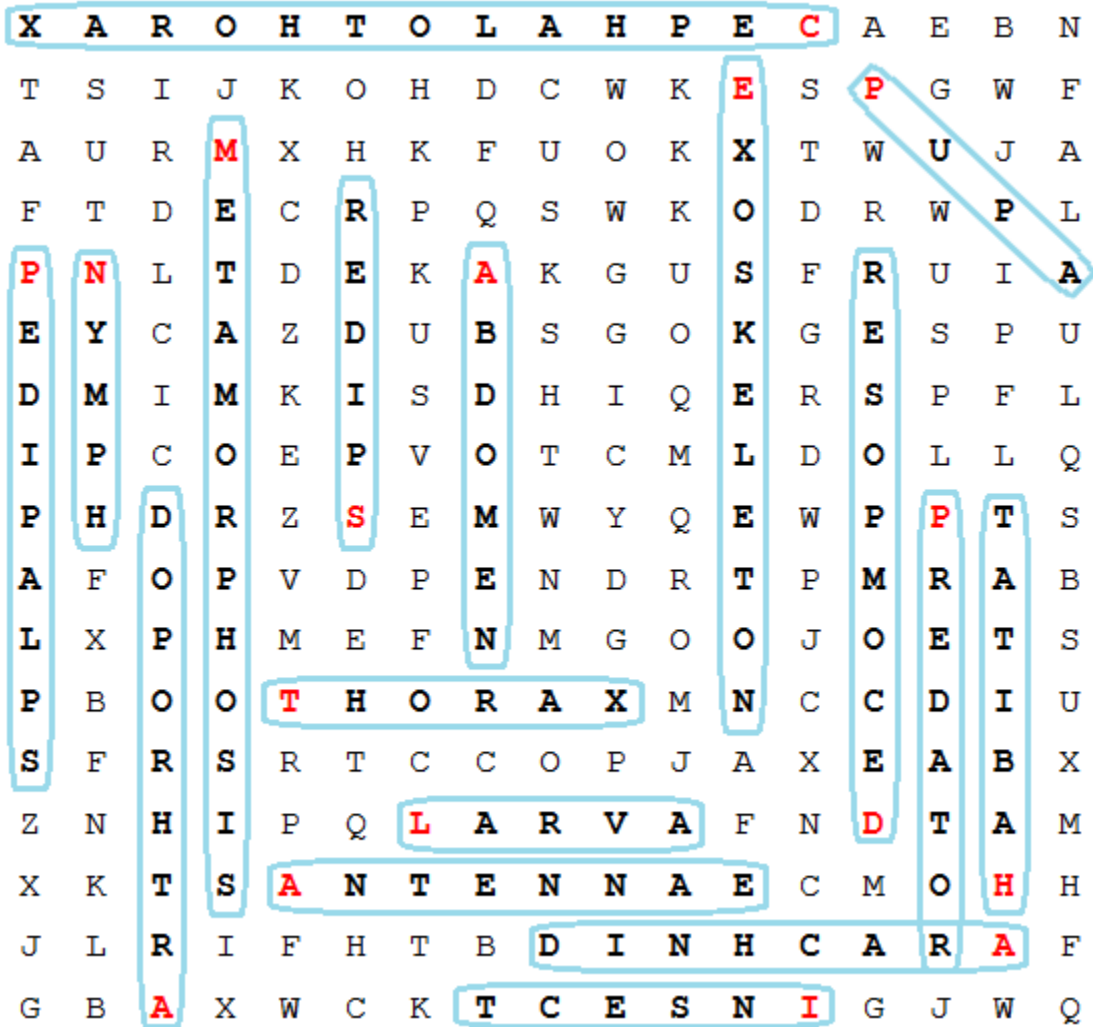
Insects and Arthropods

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

Word Bank

ABDOMEN	EXOSKELETON	PEDIPALPS
ANTENNAE	HABITAT	PREDATOR
ARACHNID	INSECT	PUPA
ARTHROPOD	LARVA	SPIDER
CEPHALOTHORAX	METAMORPHOSIS	THORAX
DECOMPOSER	NYMPH	

Answer Key
Language Arts Word Search
Insects and Arthropods



Word Bank

- | | | |
|---------------|---------------|-----------|
| ABDOMEN | EXOSKELETON | PEDIPALPS |
| ANTENNAE | HABITAT | PREDATOR |
| ARACHNID | INSECT | PUPA |
| ARTHROPOD | LARVA | SPIDER |
| CEPHALOTHORAX | METAMORPHOSIS | THORAX |
| DECOMPOSER | NYMPH | |

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>

[RAFT Idea: Evolution by Natural Selection – RAFT Bay Area](#)

Grades Covered: 3 through 12

Subjects Covered: Life Science

Curriculum topics: Adaptation, Evolution, Fitness, Natural Selection, Predator-Prey Interactions, Variation

Description: Simulate evolution with critters and beaky birds...

<http://www.raftbayarea.org/ideas/Evolution%20by%20Natural%20Selection.pdf>

Insects, Spiders and Other Arthropods: Education Standards

Our Insects, Spiders, and Other Arthropods program will contribute to students' ability to meet the California Science Content Standards, Common Core, and Next Generation Science Standards listed below.

California Science Content Standards Fourth Grade:

Life Sciences: 2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:

- c. *Students know* decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

- c. *Students know* many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

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

Common Core Fourth Grade:

Speaking and Listening Standards: Students will...

1. Engage effectively in a range of collaborative discussions with diverse partners on *grade four topics*, building on each others' ideas and expressing their own clearly.
 - a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
 - b. Follow agreed-upon rules for discussions and carry out assigned roles.
 - c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
 - d. Review key ideas expressed and explain their own ideas and understanding in light of the discussion.
2. Paraphrase portions of information presented orally.
3. Identify the reasons and evidence a speaker provides to support particular points.

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

Next Generation Science Standards Fourth Grade:

Structure, Function, and Information Processing

- **4-LS1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
 - **Science and Engineering Practices**
 - **Engaging in Argument from Evidence:** builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed worlds
 - Construct an argument with evidence, data, and/or a model. (4-LS1-1)
 - **Disciplinary Core Ideas**

Insects, Spiders and Other Arthropods: Education Standards

- **LS1.A: Structure and Function:** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)
- **Crosscutting Concepts**
 - **Systems and System Models:** A system can be described in terms of its components and their interactions. (4-LS1-1)
- **4-LS1-2:** Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
 - **Science and Engineering Practices**
 - **Developing and Using Models:** builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.
 - Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2).
 - **Disciplinary Core Ideas**
 - **LS1.D: Information Processing:** Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal’s brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)
 - **Crosscutting Concepts**
 - **Systems and System Models:** A system can be described in terms of its components and their interactions. (4-LS1-2)

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