

# INVERTEBRATES

## KINDERGARTEN - SECOND

### Life Science TEKS

<i>Kindergarten:</i>	K.9A, K.9B, K.10B
<i>First Grade:</i>	1.9A, 1.9B, 1.9C, 1.10A
<i>Second Grade:</i>	2.9A, 2.9C, 2.10A

### Vocabulary

antenna, eyes, insects, interdependence, invertebrates, legs, magnifying glass, oxygen, pollinate, predator, prey, snails, spiders, vertebrates, worms

### Pre-Show Activity

#### Pre-Show Lesson: Invertebrates

Post this question on the board: "What do you know about invertebrates?"

#### Materials:

Per group: Title pages for centers (Appendix A-1), objects listed below in each center description

Per student: note taking pages (Appendix A-2)

#### Procedure:

1. Set up six centers total, two of each type listed below (titles available in Appendix A-1). Attach the center title page to a file folder and stand it up at each center. Students will rotate through the three center types and fill out an observation sheet in each center.

Center 1: Worms Students should observe live earthworms at this center. You may also want to have as many of the following as possible: books on worms, pictures of worms, plastic worms (you can get these at bait stores or toy stores), magnifying glasses, colored pencils and Styrofoam plates for observation.

Center 2: Insects Students should observe live insects at this station. You can purchase crickets at pet stores or get insects from a garden, such as pill bugs. You may also want to have as many of the following as possible: books on insects, pictures of insects, plastic insects (you can get these at a toy store), magnifying glasses, colored pencils and Styrofoam plates for observation.

Center 3: Snails Students should observe live snails at this station. You can find snails in a garden or have the children bring them in. You may also want to have as many of the following as possible: books on snails, pictures of snails, plastic snails (you can get these at a toy store), magnifying glasses, colored pencils and Styrofoam plates for observation.

2. Ask students what they think the word “invertebrate” means. Make sure that students understand that invertebrates are animals with no backbone. Discuss the prefix “in-”. Give them examples of words they know that have this prefix, like incomplete, inactive and incorrect. Explain that the prefix “in-” means not. Ask students what a vertebrate is. Have them feel their backbone. Explain that invertebrate means the animal does *not* have a backbone.
3. Read a book to students about invertebrates. Then, discuss the traits of invertebrates as you read. Possible books to read:

*Animals Without Backbones (Big Science Ideas)* by Bobbie Kalman

*Incredible Invertebrates (TIME for Kids Nonfiction Readers)* by Debra J. Housel

*Animals Without Backbones (Really Wild Life of Insects)* by Elaine Pascoe and Dwight Kuhn

## Post-Show Enrichment Activities

### Activity One: Invertebrates Show Review

*Materials:* yarn

*Procedure:*

1. Sit in a circle on the floor with the class.
2. Holding a ball of yarn, hold onto one end and tell one thing that you learned from the show.
3. Toss the ball of yarn to another person in the circle. When the next person gets the ball of yarn, they will need to unravel about five feet of yarn.
4. They will tell one thing that they learned from the show, and toss the yarn to someone else in the circle. When students share, they should share something that has not already been stated. Students will need to listen so they do not repeat answers.
5. After everyone has shared, you should have a big web. Explain to students that this represents our world. Plants and animals, both vertebrates and invertebrates, all depend on one another. Ask students to share examples of how we depend on other organisms (interdependence).

*Examples:* plants give us food, insects pollinate plants, plants give us oxygen, we get food from animals, animals get food from each other, etc.

6. Now ask: "What happens if we pollute this world?" Answer: It affects us all. Tell students that you are an organism and have been polluted. You are connected to other organisms and they are connected to other organisms and so on.
7. Tell them that you are going to tug on your string lightly and if they feel a tug, then they should tug. Eventually, all students should feel a tug. Remind students that all parts of an ecosystem are important, even the invertebrates, and if we harm one, it can harm the whole ecosystem.

## Activity Two: Invertebrate Hunt

*Materials:* data charts in notebooks

*Procedure:*

1. Tell students that the class is going to be going outside to hunt for invertebrates. Remind them that insects, spiders and snails are all invertebrates. Any animal that doesn't have a backbone is an invertebrate.
2. Students will need to take their science notebooks and a pencil. Create a data chart, like the one below, for keeping track of the number of invertebrates that you find.

	Number Found
Insects	
Spiders	
Snails	

3. Tell students that they are not going to touch the invertebrates. They are just going to count them. As a class, keep track of how many of each invertebrate you find. Older students can keep track on their own data chart in their science notebook.
4. You may need to turn over logs. Be sure to turn them over away from you and teach children why it is not safe to turn them over toward you. There could be a snake underneath.
5. When your hunt is over, return to class and graph your results.

## Activity Three: How Spiders Eat

*Materials:* grape, staple remover, coffee stirrer

*Procedure:*

1. Ask students, "How many of you like spiders?"
2. Ask students to turn and talk to a partner about what spiders are good for.

*Teacher Information: (Source: University of Arizona)*

### **Positive**

Spiders help manage insect populations by eating lots of insects. Medical research using spider venom has yielded several chemicals that may be useful to control or treat diseases in humans.

### **Negative**

The spider's bite may cause pain, but in most cases the venom is usually harmless. Avoid using black widow spiders and brown recluse spiders in classroom and field study. Their venom can cause more adverse reactions in humans than other types of spider venom.

3. Discuss with students how spiders have the need for food. Students will turn and talk to their partners about what they think spiders eat.

*Teacher Information: (Source: University of Arizona)*

### **Food**

Spiders are predators that eat various other arthropods, usually smaller than themselves. Common prey includes crickets, flies, bees, grasshoppers, moths and butterflies.

### **Predators**

Some wasps, other spiders, birds and lizards.

Show the short video segment showing a jumping spider catching its prey.

<http://video.nationalgeographic.com/video/kids/animals-pets-kids/bugs-kids/jumping-spider-kids/>

4. Discuss with students how spiders eat their prey.

*Teacher Information: (Source: <http://science.howstuffworks.com>)*

Most spiders don't eat their prey whole; instead, they expel digestive enzymes onto or into the animal to liquefy it. Some spiders use their fangs to inject the digestive fluid directly into the animal. This sort of spider liquefies the animal's insides, leaving the exoskeleton more or less intact. Then it sucks the liquefied remains into its stomach through hairs on its chelicerae and mouth, which act as a filter. Other species chew their prey up with serrated "teeth" on the chelicerae before vomiting digestive fluid on the body and sucking in the liquid remains.

### **Venomous to Humans**

A very small percentage of spiders are venomous to humans. Venomous means the spiders may inject humans with dangerous poison (generally called venom in this context), whereas poisonous means the spiders would be harmful if eaten. The

effects of spider venom vary depending on the species, age and sex of the spider and on the age and health of the bitten person.

Neurotoxins in the venom may affect the human nervous system, causing dizziness, difficulty breathing, nausea, blurred vision and muscle rigidity, among other things. The venom may also kill tissue surrounding the bite. Generally, if a bite victim gets medical attention, they'll suffer minimal damage. If left untreated, a spider bite can kill, though this is very rare.

In North America, the most famous dangerous spiders are the black widow and the brown recluse. Both spiders can potentially kill, but the danger is slight for healthy adults. The spiders are both reclusive by nature and will only bite if they feel threatened.

5. Create a model of how spiders eat.

- Students will use a grape to model an insect.
- They will use a staple remover or toothpick as the spider's teeth to puncture the grape and release the poison.
- Students will slowly squish the grape back and forth to model how the poison softens and dissolves the body tissue.
- They will use a small piece of coffee stirrer to model the part of their body that sucks up the prey. The grape skin is the exoskeleton that is left behind.
- Students will draw and label the model in their science notebooks. They can also write out the steps that the spider goes through to eat its prey.

6. Debrief with students discussing the adaptations that spiders have to eat their prey.

Extension:

Students can compare and contrast the bodies of a spider and an insect.

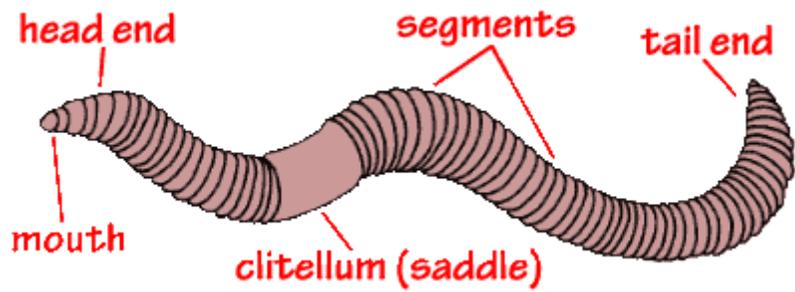
Appendix

A-1

**Worms**



Source: Wikipedia



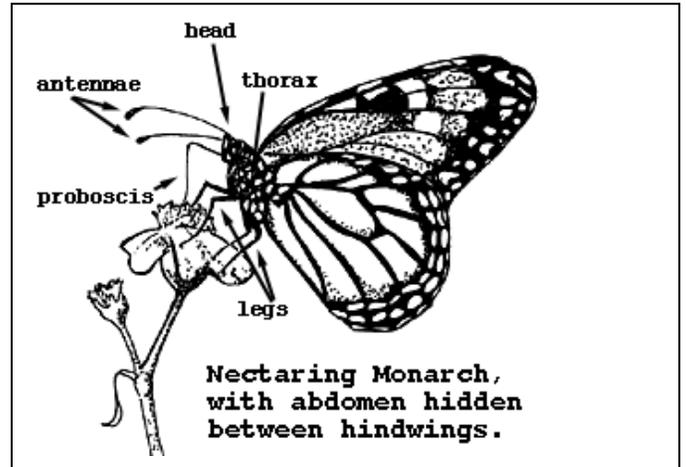
Source: wormsgalore.com.au

# Insects

## Butterfly



Source: Wikipedia

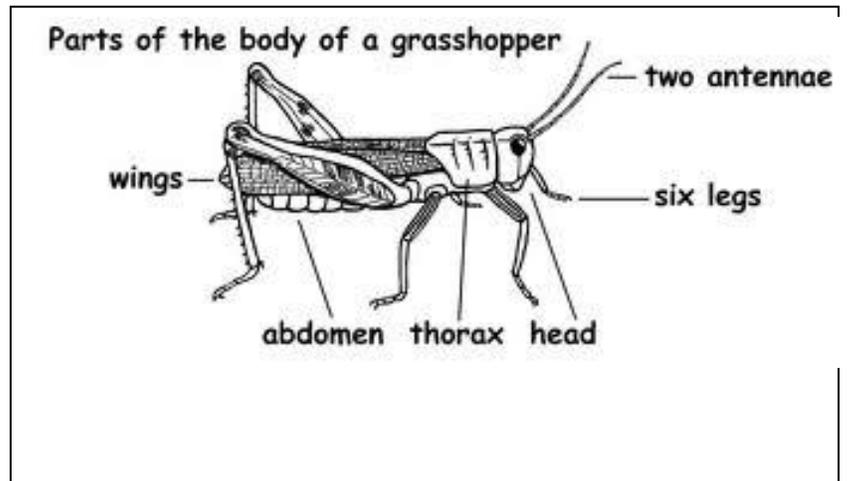


Source: monarchwatch.org

## Grasshopper



Source: Wikipedia

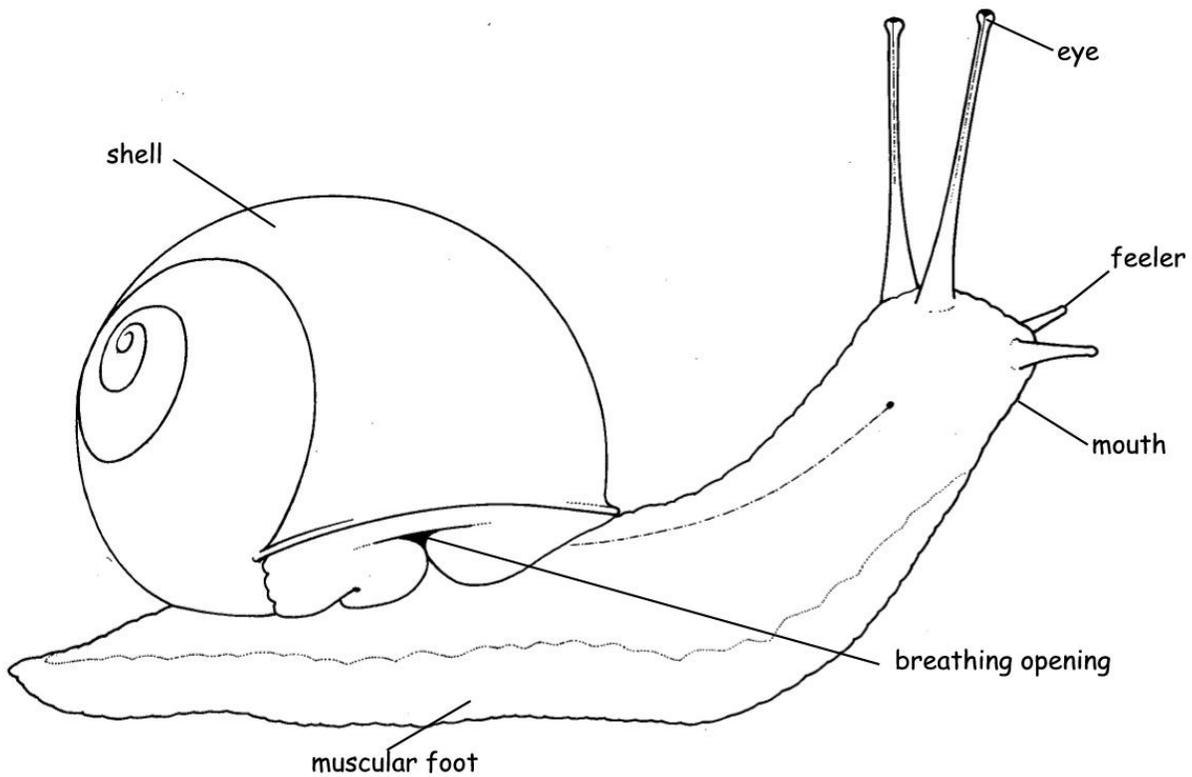


Source: exploringnature.org

# Snails



Source: Wikipedia



Source: cnx.org

A-2

Name \_\_\_\_\_

Date \_\_\_\_\_

## Invertebrates

Draw a picture and write the name of invertebrate that you are observing in this box. Label the parts.

Body Part	Amount
 Mouth	
 Antenna	
 Legs	
 Eyes	

Graphic Sources:

Mouth: [clker.com](http://clker.com)

Legs: [biology-resources.com](http://biology-resources.com)

Antenna: [etc.usf.edu](http://etc.usf.edu)

Eyes: [partsandreplacements.info](http://partsandreplacements.info)