

# Chapter Resources

## Invertebrate Animals

### Includes:

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#### Reproducible Student Pages

##### ASSESSMENT

- ✓ Chapter Tests
- ✓ Chapter Review

##### HANDS-ON ACTIVITIES

- ✓ Lab Worksheets for each Student Edition Activity
- ✓ Laboratory Activities
- ✓ Foldables—Reading and Study Skills activity sheet

##### MEETING INDIVIDUAL NEEDS

- ✓ Directed Reading for Content Mastery
- ✓ Directed Reading for Content Mastery in Spanish
- ✓ Reinforcement
- ✓ Enrichment
- ✓ Note-taking Worksheets

##### TRANSPARENCY ACTIVITIES

- ✓ Section Focus Transparency Activities
- ✓ Teaching Transparency Activity
- ✓ Assessment Transparency Activity

##### Teacher Support and Planning

- ✓ Content Outline for Teaching
- ✓ Spanish Resources
- ✓ Teacher Guide and Answers



**Glencoe**

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### Additional Assessment Resources available with Glencoe Science:

- ExamView® Pro Testmaker
- Assessment Transparencies
- Performance Assessment in the Science Classroom
- Standardized Test Practice Booklet
- MindJogger Videoquizzes
- Vocabulary PuzzleMaker at **msscience.com**
- Interactive Chalkboard
- The Glencoe Science Web site at: **msscience.com**
- An interactive version of this textbook along with assessment resources are available online at: **mhln.com**

# To the Teacher

This chapter-based booklet contains all of the resource materials to help you teach this chapter more effectively. Within you will find:

## Reproducible pages for

- Student Assessment
- Hands-on Activities
- Meeting Individual Needs (Extension and Intervention)
- Transparency Activities

## A teacher support and planning section including

- Content Outline of the chapter
- Spanish Resources
- Answers and teacher notes for the worksheets

## Hands-On Activities

**MiniLAB and Lab Worksheets:** Each of these worksheets is an expanded version of each lab and MiniLAB found in the Student Edition. The materials lists, procedures, and questions are repeated so that students do not need their texts open during the lab. Write-on rules are included for any questions. Tables/charts/graphs are often included for students to record their observations. Additional lab preparation information is provided in the *Teacher Guide and Answers* section.

**Laboratory Activities:** These activities do not require elaborate supplies or extensive pre-lab preparations. These student-oriented labs are designed to explore science through a stimulating yet simple and relaxed approach to each topic. Helpful comments, suggestions, and answers to all questions are provided in the *Teacher Guide and Answers* section.

**Foldables:** At the beginning of each chapter there is a *Foldables: Reading & Study Skills* activity written by renowned educator Dinah Zike that provides students with a tool that they can make themselves to organize some of the information in the chapter. Students may make an organizational study fold, a cause and effect study fold, or a compare and contrast study fold, to name a few. The accompanying *Foldables* worksheet found in this resource booklet provides an additional resource to help students demonstrate their grasp of the concepts. The worksheet may contain titles, subtitles, text, or graphics students need to complete the study fold.

## Meeting Individual Needs (Extension and Intervention)

**Directed Reading for Content Mastery:** These worksheets are designed to provide students with learning difficulties with an aid to learning and understanding the vocabulary and major concepts of each chapter. The *Content Mastery* worksheets contain a variety of formats to engage students as they master the basics of the chapter. Answers are provided in the *Teacher Guide and Answers* section.

**Directed Reading for Content Mastery (in Spanish):** A Spanish version of the *Directed Reading for Content Mastery* is provided for those Spanish-speaking students who are learning English.

**Reinforcement:** These worksheets provide an additional resource for reviewing the concepts of the chapter. There is one worksheet for each section, or lesson, of the chapter. The *Reinforcement* worksheets are designed to focus primarily on science content and less on vocabulary, although knowledge of the section vocabulary supports understanding of the content. The worksheets are designed for the full range of students; however, they will be more challenging for your lower-ability students. Answers are provided in the *Teacher Guide and Answers* section.

**Enrichment:** These worksheets are directed toward above-average students and allow them to explore further the information and concepts introduced in the section. A variety of formats are used for these worksheets: readings to analyze; problems to solve; diagrams to examine and analyze; or a simple activity or lab which students can complete in the classroom or at home. Answers are provided in the *Teacher Guide and Answers* section.

**Note-taking Worksheet:** The *Note-taking Worksheet* mirrors the content contained in the teacher version—*Content Outline for Teaching*. They can be used to allow students to take notes during class, as an additional review of the material in the chapter, or as study notes for students who have been absent.



## Assessment

**Chapter Review:** These worksheets prepare students for the chapter test. The *Chapter Review* worksheets cover all major vocabulary, concepts, and objectives of the chapter. The first part is a vocabulary review and the second part is a concept review. Answers and objective correlations are provided in the *Teacher Guide and Answers* section.

**Chapter Test:** The *Chapter Test* requires students to use process skills and understand content. Although all questions involve memory to some degree, you will find that your students will need to discover relationships among facts and concepts in some questions, and to use higher levels of critical thinking to apply concepts in other questions. Each chapter test normally consists of four parts: Testing Concepts measures recall and recognition of vocabulary and facts in the chapter; Understanding Concepts requires interpreting information and more comprehension than recognition and recall—students will interpret basic information and demonstrate their ability to determine relationships among facts, generalizations, definitions, and skills; Applying Concepts calls for the highest level of comprehension and inference; Writing Skills requires students to define or describe concepts in multiple sentence answers. Answers and objective correlations are provided in the *Teacher Guide and Answers* section.



## Transparency Activities

**Section Focus Transparencies:** These transparencies are designed to generate interest and focus students' attention on the topics presented in the sections and/or to assess prior knowledge. There is a transparency for each section, or lesson, in the Student Edition. The reproducible student masters are located in the *Transparency Activities* section. The teacher material, located in the *Teacher Guide and Answers* section, includes Transparency Teaching Tips, a Content Background section, and Answers for each transparency.

**Teaching Transparencies:** These transparencies relate to major concepts that will benefit from an extra visual learning aid. Most of these transparencies contain diagrams/photos from the Student Edition. There is one *Teaching Transparency* for each chapter. The *Teaching Transparency Activity* includes a black-and-white reproducible master of the transparency accompanied by a student worksheet that reviews the concept shown in the transparency. These masters are found in the *Transparency Activities* section. The teacher material includes Transparency Teaching Tips, a Reteaching Suggestion, Extensions, and Answers to Student Worksheet. This teacher material is located in the *Teacher Guide and Answers* section.

**Assessment Transparencies:** An *Assessment Transparency* extends the chapter content and gives students the opportunity to practice interpreting and analyzing data presented in charts, graphs, and tables. Test-taking tips that help prepare students for success on standardized tests and answers to questions on the transparencies are provided in the *Teacher Guide and Answers* section.

## Teacher Support and Planning

**Content Outline for Teaching:** These pages provide a synopsis of the chapter by section, including suggested discussion questions. Also included are the terms that fill in the blanks in the students' *Note-taking Worksheets*.

**Spanish Resources:** A Spanish version of the following chapter features are included in this section: objectives, vocabulary words and definitions, a chapter purpose, the chapter Activities, and content overviews for each section of the chapter.

# Reproducible Student Pages

## Reproducible Student Pages

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MiniLAB: <i>Observing Sow Bugs</i> . . . . .	4
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Lab: Design Your Own <i>Garbage-Eating Worms</i> . . . . .	7
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# Hands-On Activities





## Modeling Cephalopod Propulsion

### Procedure

1. Blow up a **balloon**. Hold the end closed, but don't tie it.
2. Let go of the balloon.
3. Repeat steps 1 and 2 three more times.

### Data and Observations

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### Analysis

1. In the Data and Observations section, describe how the balloon moved when you let go.
2. If the balloon models an octopus or squid as it swims through the water, infer how cephalopods can escape from danger.

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## Observing Sow Bugs

### Procedure

1. Place six **sow bugs** in a clean, **flat container**.
2. Put a damp **sponge** at one end of the container.
3. Cover the container for 60 s. Remove the cover and observe where the sow bugs are. Record your observations in the space below.

### Data and Observations

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### Analysis

1. What type of habitat do the sow bugs seem to prefer?

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2. Where do you think you could find sow bugs near your home?

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# Observing Complete Metamorphosis

## Lab Preview

**Directions:** Answer these questions before you begin the Lab.

1. Why is the animal safety symbol used in this lab?

2. Do you expect to see a nymph stage during this lab? Why or why not?

*Many insects go through complete metamorphosis during their life cycles. Chemicals that are secreted by the body of the animal control the changes. How different are the body forms of the four stages of metamorphosis?*

## Real-World Question

What do the stages of metamorphosis look like for a mealworm?

**Safety Precautions** 

**WARNING:** Be careful when working with animals. Never touch your face during the lab. Wash your hands thoroughly after completing the lab.

## Materials

large-mouth jar or old fish bowl  
bran or oatmeal  
dried bread or cookie crumbs mixed with flour  
slice of apple or carrot

paper towel  
cheesecloth  
mealworms  
rubber band

## Goals

- **Observe** metamorphosis of mealworms.
- **Compare** the physical appearance of the mealworms at each stage of metamorphosis.

## Procedure

1. Set up a habitat for the mealworms by placing a 1-cm layer of bran or oatmeal on the bottom of the jar. Add a 1-cm layer of dried bread or cookie crumbs mixed with flour. Then add another layer of bran or oatmeal.
2. Add a slice of apple or carrot as a source of moisture. Replace the apple or carrot daily.
3. Place 20 to 30 mealworms in the jar. Add a piece of crumpled paper towel.
4. Cover the jar with a piece of cheesecloth. Use the rubber band to secure the cloth to the jar.
5. **Observe** the mealworms daily for two to three weeks. Record daily observations on a separate piece of paper.



(continued)

## Data and Observations

### Conclude and Apply

1. **Draw and describe** the mealworms' metamorphosis to adults under Data and Observations.
2. **Describe** some of the advantages of an insect's young being different from the adults.

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3. **Infer** where you might find mealworms or adult darkling beetles in your house.

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### Communicating Your Data

Draw a cartoon showing the different stages of metamorphosis from mealworm to adult darkling beetle. **For more help, refer to the Science Skill Handbook.**



## Design Your Own Garbage-Eating Worms

### Lab Preview

**Directions:** Answer these questions before you begin the Lab.

1. What safety symbols are associated with this lab?

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2. How do earthworms use the soil they live in?

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*Susan knows that soil conditions can influence the growth of plants. She is trying to decide what factors might improve the soil in her backyard garden. A friend suggests that earthworms improve the quality of the soil. How could Susan find out if the presence of earthworms has any value in improving soil conditions?*

### Real-World Question

How does the presence of earthworms change the condition of the soil?

### Form a Hypothesis

Based on your reading and observations, state a hypothesis about how earthworms might improve the conditions of soil.

### Goals

- **Design** an experiment that compares the condition of soil in two environments—one with earthworms and one without.
- **Observe** the change in soil conditions for two weeks.

### Safety Precautions



**WARNING:** Be careful when working with live animals. Always keep your hands wet when handling earthworms. Don't touch your face during the lab. Wash your hands thoroughly after the lab.

### Possible Materials

worms (red wigglers)  
 4-L plastic containers with drainage holes (2)  
 soil (7 L)  
 shredded newspaper  
 spray bottle  
 chopped food scraps including fruit and vegetable peels, pulverized eggshells, tea bags, and coffee grounds (Avoid meat and fat scraps.)

### Test Your Hypothesis

#### Make a Plan

1. As a group, agree upon a hypothesis and decide how you will test it. Identify what results will support the hypothesis.
2. List the steps you will need to take to test your hypothesis. Be specific. Describe exactly what you will do in each step. List your materials.
3. Prepare a data table on a separate piece of paper to record your observations.



(continued)

4. Read over the entire experiment to make sure all the steps are in a logical order.
5. **Identify** all constants, variables, and controls of the experiment.
2. Carry out the experiment according to the approved plan.
3. While doing the experiment, record your observations and complete the data table.

### Follow Your Plan

1. Make sure your teacher approves your plan before you start.

### Analyze Your Data

1. **Compare** the changes in the two sets of soil samples.

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2. **Compare** your results with those of other groups.

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3. **Identify** the control in this experiment.

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4. What were your variables?

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### Conclude and Apply

1. **Explain** whether the results support your hypothesis.

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2. **Describe** what effect you think rain would have on the soil and worms.

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### Communicating Your Data

Write an informational pamphlet on how to use worms to improve garden soil. Include diagrams and a step-by-step procedure.

**LAB**  
**1** Laboratory  
 Activity

## Earthworm Anatomy

The earthworm is an invertebrate that has a segmented body and specialized body parts. Oxygen from the air moves into its body through its moist skin. Carbon dioxide moves out of its body through the skin. The earthworm has a closed circulatory system with five heart-like structures, called aortic arches. All the worms blood is contained in blood vessels. The segmented body plan makes an earthworm's anatomy easy to study.

### Strategy

You will observe the external parts of an earthworm.

You will dissect an earthworm.

You will identify the internal organs and organ systems of an earthworm.

### Materials

dissecting pan with wax

earthworm (preserved)

hand lens

dissecting pins

dissecting scissors

dissecting needle

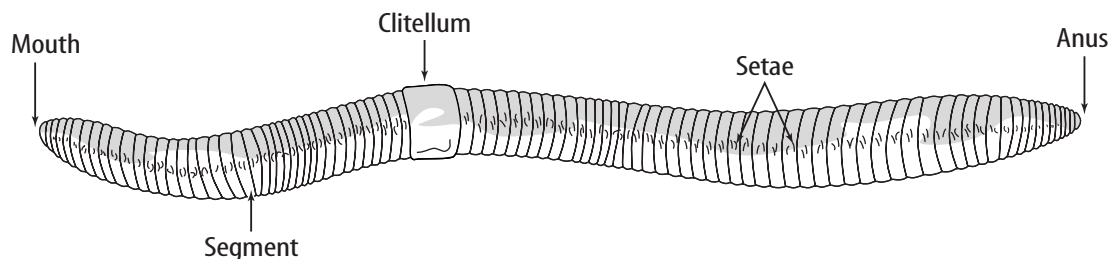
### Procedure



#### Part A—External Structure

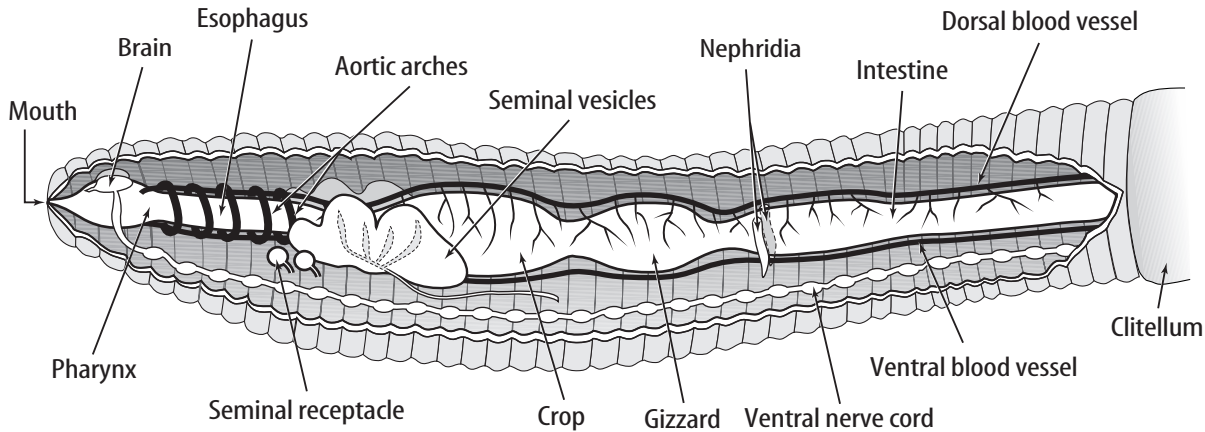
- Place a preserved earthworm lengthwise in the dissecting pan with the darker side up. This is the dorsal or top side. **WARNING:** *Wash hands thoroughly after handling worm.*
- Examine the external structure and identify the parts shown in Figure 1.
- Run your fingers lightly across the top, bottom, and both sides of the earthworm. The bristles that you feel are called setae.
- Examine the setae with a hand lens. Estimate the number of setae on each segment.
- Locate the mouth. The part that hangs over the mouth is called the prostomium.
- Find the thickened band circling the body. This is the clitellum. It forms a cocoon for depositing the eggs during reproduction.
- Locate the anus (see Figure 1).

**Figure 1**



## Laboratory Activity 1 (continued)

Figure 2



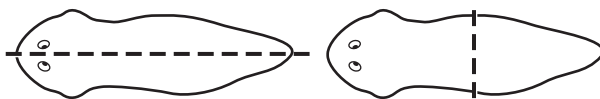
### Part B—Internal Structure

**Directions:** Read the instructions carefully and study Figures 1 and 2 before you begin to dissect. Identify structures to be dissected before you begin.

**WARNING:** Always be careful with all sharp objects.

1. With the dorsal side up, pin both ends of the worm to the wax in the dissecting pan.
2. With scissors, begin about 2 cm in front of the clitellum and cut forward through the body wall just to the left of the dorsal blood vessel. Use care to cut through only the body wall. See Figure 3.
3. Separate the edges of the cut. Observe the space between the body wall and the intestine. This is the body cavity or coelom.

Figure 3



4. Observe the partitions between the segments. Use a dissecting needle to break these partitions. Then pin down the sides of the body wall.
5. Observe the tubelike digestive system. Identify the pharynx in segments 4 and 5. It is used to swallow food.
6. Follow the esophagus to segment 15.
7. Locate the large thin-walled crop. Food is stored in the crop until it is digested.
8. Locate the gizzard just behind the crop. Food is broken down by a grinding action in the gizzard here. The intestine extends from the gizzard to the anus. Digestion of food occurs in the intestine.
9. Each earthworm has both male and female reproductive organs. Alongside the esophagus in segments 9 and 10 are two pairs of seminal receptacles. The seminal receptacles receive sperm from another worm. In front of the receptacles in segments 10, 11, and 12 are seminal vesicles where sperm is stored.
10. Use a hand lens to find the small ovaries where eggs are produced. The ovaries are located under the seminal vesicles.
11. Locate the dorsal blood vessel. It carries blood to the heart-like structure, called the aortic arches. Carefully remove the white seminal vesicles from the left side of the body. Find the aortic arches, which branch from the dorsal blood vessel and pass around the esophagus.



## Laboratory Activity 1 (continued)

These arches join the ventral blood vessel below the esophagus. These aortic arches contract and function as hearts. The ventral blood vessel carries blood toward the skin and intestine.

12. Use a hand lens to observe the small white tubes along each side of the digestive tract. These tubes are excretory organs called nephridia. They are found in all segments except the first three and the last. They remove the wastes from the body.
13. Find the double nerve ganglion, or brain, of the earthworm near segment 2. The brain connects with the ventral nerve cord, which extends the length of the body. The nerve cord is a white line on the ventral body wall.
14. **WARNING:** Give all dissected materials to your teacher for disposal. Always wash your hands after a dissection procedure.

## Data and Observations

List the organs found in each system in Table 1.

**Table 1**

Systems and Organs of an Earthworm	
System	Organs
1. Digestive	
2. Reproductive	
3. Circulatory	
4. Excretory	
5. Nervous	

## Questions and Conclusions

1. How many setae were located on each segment?

\_\_\_\_\_

2. What is the function of the setae?

\_\_\_\_\_

3. Describe the function of the following organs:

a. pharynx

\_\_\_\_\_

b. crop

\_\_\_\_\_

c. gizzard

\_\_\_\_\_

**Laboratory Activity 1 (continued)**

d. aortic arches

\_\_\_\_\_

e. dorsal blood vessel

\_\_\_\_\_

f. ventral blood vessel

\_\_\_\_\_

g. clitellum

\_\_\_\_\_

h. nephridia

\_\_\_\_\_

i. seminal vesicles

\_\_\_\_\_

j. intestine

\_\_\_\_\_

k. ganglia

\_\_\_\_\_

4. Why is it said that the earthworm has a “closed” circulatory system?

\_\_\_\_\_

**Strategy Check**

\_\_\_\_\_ Can you dissect an earthworm?

\_\_\_\_\_ Can you identify the external parts of the earthworm?

\_\_\_\_\_ Can you identify the internal organs and organ systems of an earthworm?

**LAB**  
**2** Laboratory  
Activity

## Grasshopper Anatomy

A grasshopper is well adapted to its way of life. Its features are representative of the insect group. A grasshopper is large enough that its features can be seen easily.

### Strategy

You will observe and identify the specialized body parts of the grasshopper. You will examine and identify the internal structure of the grasshopper.

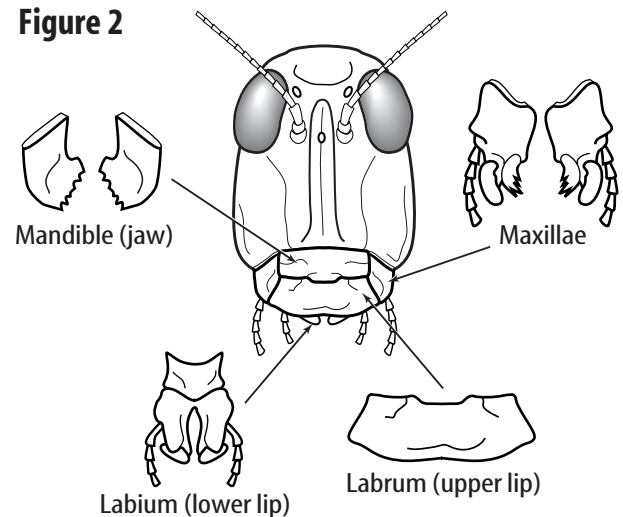
### Materials

dissecting pan  
grasshopper (preserved)  
hand lens  
forceps  
dissecting scissors

### Procedure



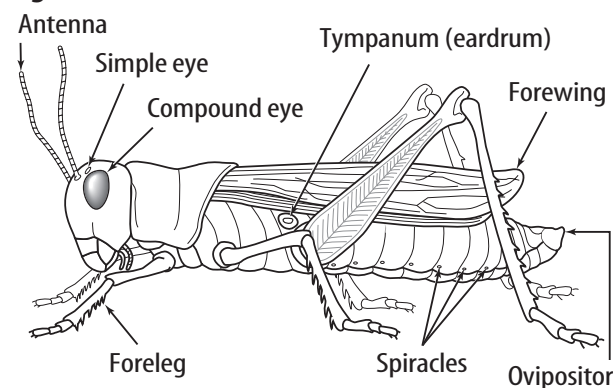
**Figure 2**



### Part A—External Structure

1. Place the grasshopper in the dissecting pan. Locate the head, thorax, and abdomen. (See Figure 1.) Use your hand lens to observe the grasshopper carefully. As you observe, record your data in Data and Observations.
2. Observe the parts of the head. The grasshopper has two compound eyes and three simple eyes. The sensory parts located on the head are antennae.
3. Identify the mouth parts. (Refer to Figure 2.) With your forceps, remove the parts. The labrum is the hinged upper lip that is used to hold food. The mandibles are crushing jaws. The maxillae are used to chew and taste food. The labium is the broad, flat lower lip used to hold food while it is being chewed.

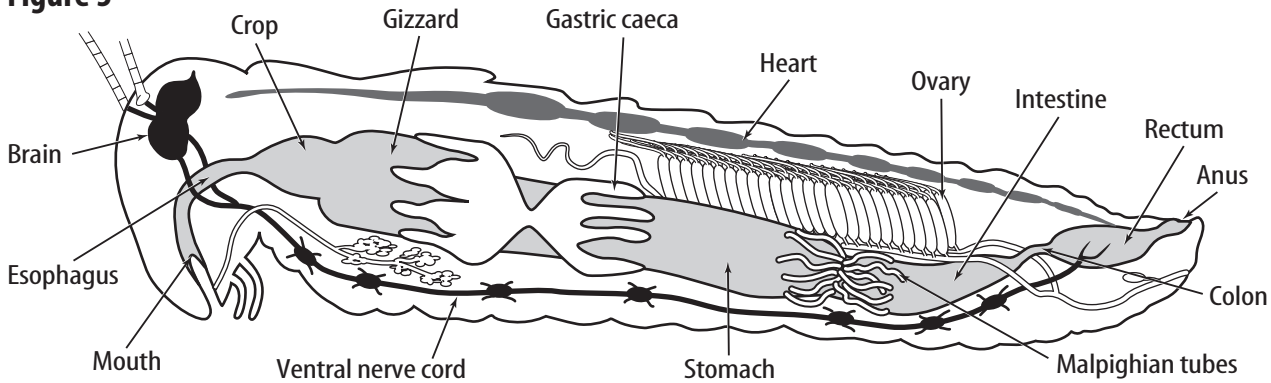
### Figure 1



4. Locate the eardrums or tympana, small drum-shaped structures on either side of the thorax.
5. All insects have six legs. In the grasshopper, the front pair is used for walking, climbing, and holding food. The middle legs are used for walking and climbing. The hind legs are large and enable the grasshopper to jump.
6. Locate the two pairs of wings.
7. Use the hand lens to look at the tiny openings along the abdomen. These are breathing pores called spiracles through which oxygen enters and carbon dioxide leaves.
8. A female grasshopper has a much longer abdomen than a male. It ends in a four-pointed tip, called an ovipositor, through which eggs are laid.

## Laboratory Activity 2 (continued)

Figure 3



### Part B—Internal Structure

1. Remove the three left legs. Insert the point of your scissors under the top surface of the last segment of the abdomen. Make a cut to the left of the mid-dorsal line. Be careful not to cut the organs underneath. In front of the thorax, cut down the left side to the bottom of the grasshopper. Cut down between the next to the last and last abdominal segments. **WARNING:** Always be careful with all sharp objects.
2. Use your forceps to pull down the left side. Locate the large dorsal blood vessel.
3. Use your scissors to cut the muscles close to the exoskeleton. Locate the finely branched trachea leading to the spiracles.
4. Cut through the exoskeleton over the top of the head between the left antenna and left eye to the mouth. Remove the exoskeleton on the left side of the head. Find the dorsal ganglion or brain.
5. Cut away the tissue to show the digestive system. Refer to Figure 3 and identify the mouth, esophagus, crop, gizzard, and stomach. Note that the gizzard and stomach are separated by a narrow place. The digestive glands, called gastric caeca, that secrete enzymes into the stomach are attached here.
6. Another narrow place separates the stomach from the intestine. Malpighian tubes, which collect wastes from the blood, are located here.
7. Observe the colon, which enlarges to form the rectum. Wastes collect here before passing out the anus.
8. In the female, the ovary is located above the intestines. In the male, a series of whitish tubes, the testes, are located above the intestine.
9. **WARNING:** Give all dissected materials to your teacher for disposal. Always wash your hands after a dissection procedure.

## Laboratory Activity 2 (continued)

### Data and Observations

1. What are the three sections of a grasshopper's body?

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2. Record your observations of grasshopper body parts in Table 1. Complete the table by listing the function of each part.

**Table 1**

Body part	How many?	Function
1. Eyes		
2. Antennae		
3. Labrum		
4. Mandibles		
5. Maxillae		
6. Labium		
7. Eardrums		
8. Legs		
9. Wings		
10. Spiracles		
11. Ovipositor (if female)		
12. Digestive glands		
13. Tubules		
14. Rectum		

### Questions and Conclusions

1. How is a grasshopper's mouth adapted for plant eating?

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2. What is the difference between a grasshopper's skeleton and yours?

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**Laboratory Activity 2 (continued)**

3. How is a grasshopper's digestive system different from yours?

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4. How does a grasshopper's legs help it to survive?

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5. To which animal group does the grasshopper belong?

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6. How does a grasshopper breathe?

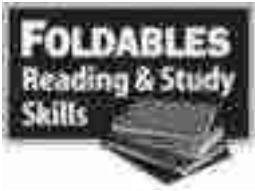
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**Strategy Check**

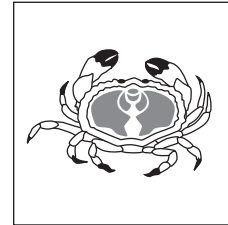
\_\_\_\_\_ Did you observe specialized parts of the grasshopper?

\_\_\_\_\_ Can you identify the internal and external parts of the grasshopper?

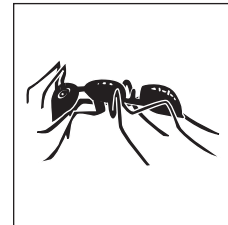


**Directions:** Use this page to label your Foldable at the beginning of the chapter.

## Land Invertebrates



## Water Invertebrates

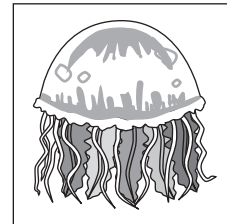


## Both

### Characteristics

### Characteristics

### Characteristics



have segmented bodies

have a shell

can be parasitic

can be filter feeders

have no internal skeleton

cannot make their own food

reproduce asexually and sexually

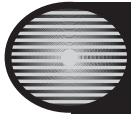
have segmented bodies

have no internal skeleton

cannot make their own food

# Meeting Individual Needs

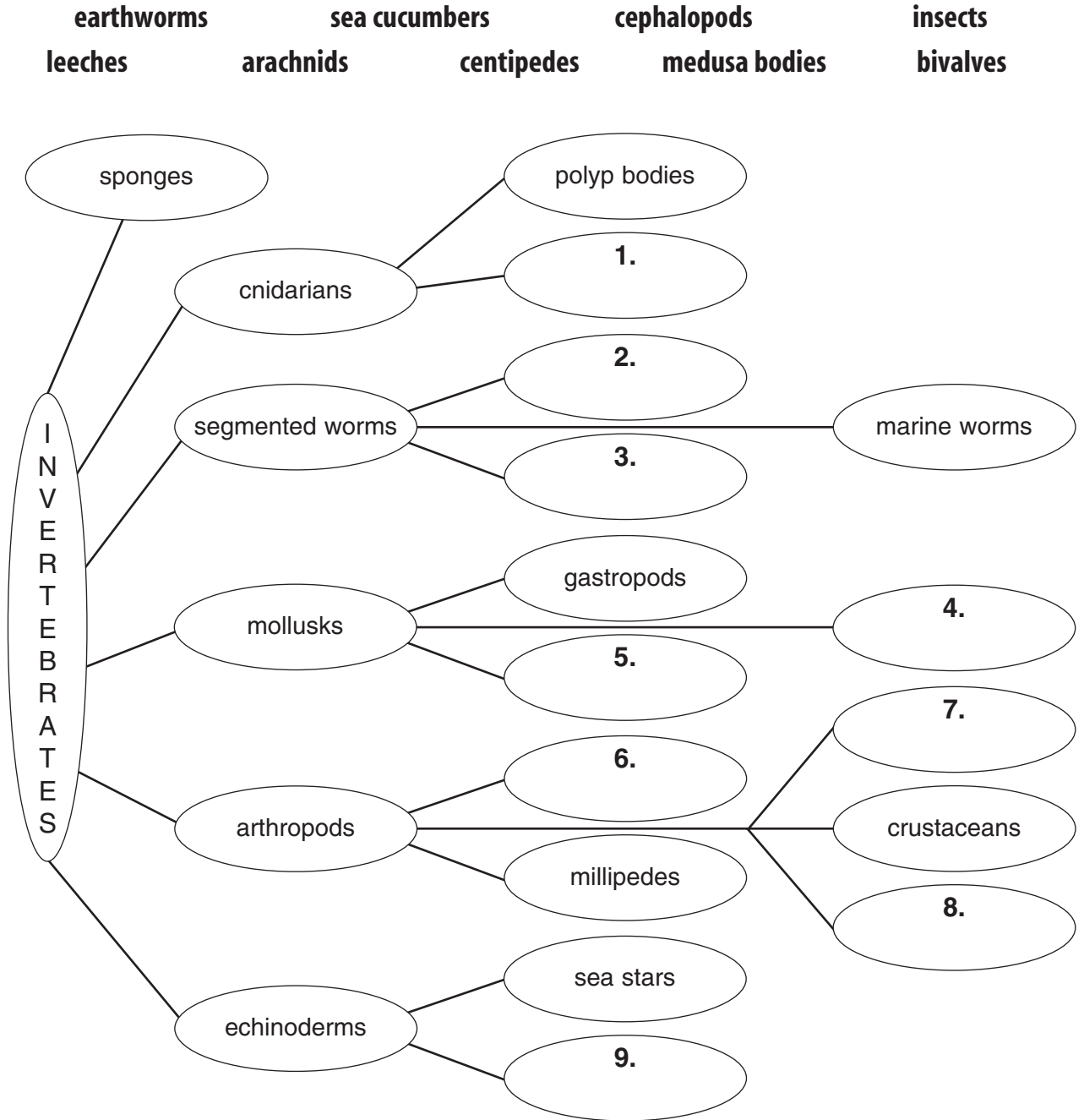


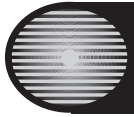


**Directed Reading for  
Content Mastery**

**Overview  
Invertebrate Animals**

**Directions:** Use the following terms to complete this concept map about invertebrates.





Directed Reading for  
Content Mastery

**Section 1** ■ What is an animal?  
**Section 2** ■ Sponges, Cnidarians,  
Flatworms, and  
Roundworms

**Directions:** Use the following terms to complete the crossword puzzle.

stinging cells

parasites

invertebrates

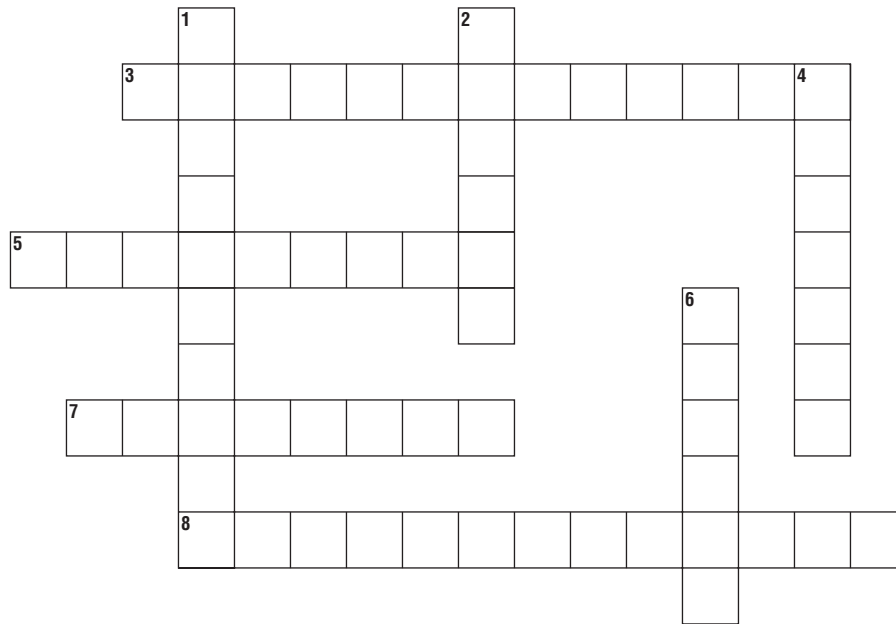
sponges

sucker

cnidarians

medusa

sea stars

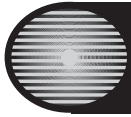


**Across**

3. Animals with no backbone
5. Animals that live on or in another animal
7. Echinoderms that can regenerate damaged parts
8. Structures used by jellyfish to catch or stun prey

**Down**

1. Hydras and corals belong to this animal group.
2. Another name for the bell-shaped body of a jellyfish
4. Animals that stay in one place and filter food from water
6. The part of a tapeworm that helps it hold onto its host



Directed Reading for  
Content Mastery

**Section 3 ■ Mollusks and  
Segmented Worms**  
**Section 4 ■ Arthropods and  
Echinoderms**

**Directions:** Draw a line from the picture to its animal group. There are two pictures for each group.

1.

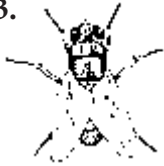


mollusk

2.

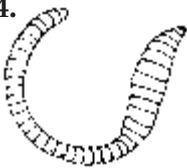


3.



segmented worm

4.



5.



arthropod

6.



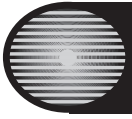
7.



8.

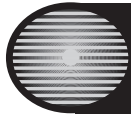


echinoderm

**Directed Reading for  
Content Mastery****Key Terms  
Invertebrate Animals**

**Directions:** In the space at the left, write the letter of the term that correctly completes each sentence.

- \_\_\_\_\_ 1. An invertebrate is an animal with no \_\_\_\_\_.  
a. appendages    b. backbone
- \_\_\_\_\_ 2. A \_\_\_\_\_ is the vase-shaped body of a cnidarian.  
a. polyp    b. medusa
- \_\_\_\_\_ 3. A \_\_\_\_\_ is an organism that depends on a host for food and a  
place to live.  
a. parasite    b. bivalve
- \_\_\_\_\_ 4. In a(n) \_\_\_\_\_ circulatory system, blood is carried within vessels.  
a. open    b. closed
- \_\_\_\_\_ 5. A \_\_\_\_\_ is the scratchy tongue-like organ of many mollusks.  
a. gill    b. radula
- \_\_\_\_\_ 6. The lightweight body covering that protects and supports arthropods is  
an \_\_\_\_\_.  
a. exoskeleton    b. endoskeleton
- \_\_\_\_\_ 7. \_\_\_\_\_ are structures, such as claws or legs, that grow from the body.  
a. Antennae    b. Appendages
- \_\_\_\_\_ 8. The change in body form that insects undergo as they mature is \_\_\_\_\_.  
a. metamorphosis    b. passive feeding
- \_\_\_\_\_ 9. A \_\_\_\_\_ is a soft-bodied invertebrate that has a mantle, a muscular  
foot, and usually a shell.  
a. cnidarian    b. mollusk
- \_\_\_\_\_ 10. Water mollusks use \_\_\_\_\_ to breathe by exchanging carbon dioxide  
for oxygen.  
a. gills    b. symmetry

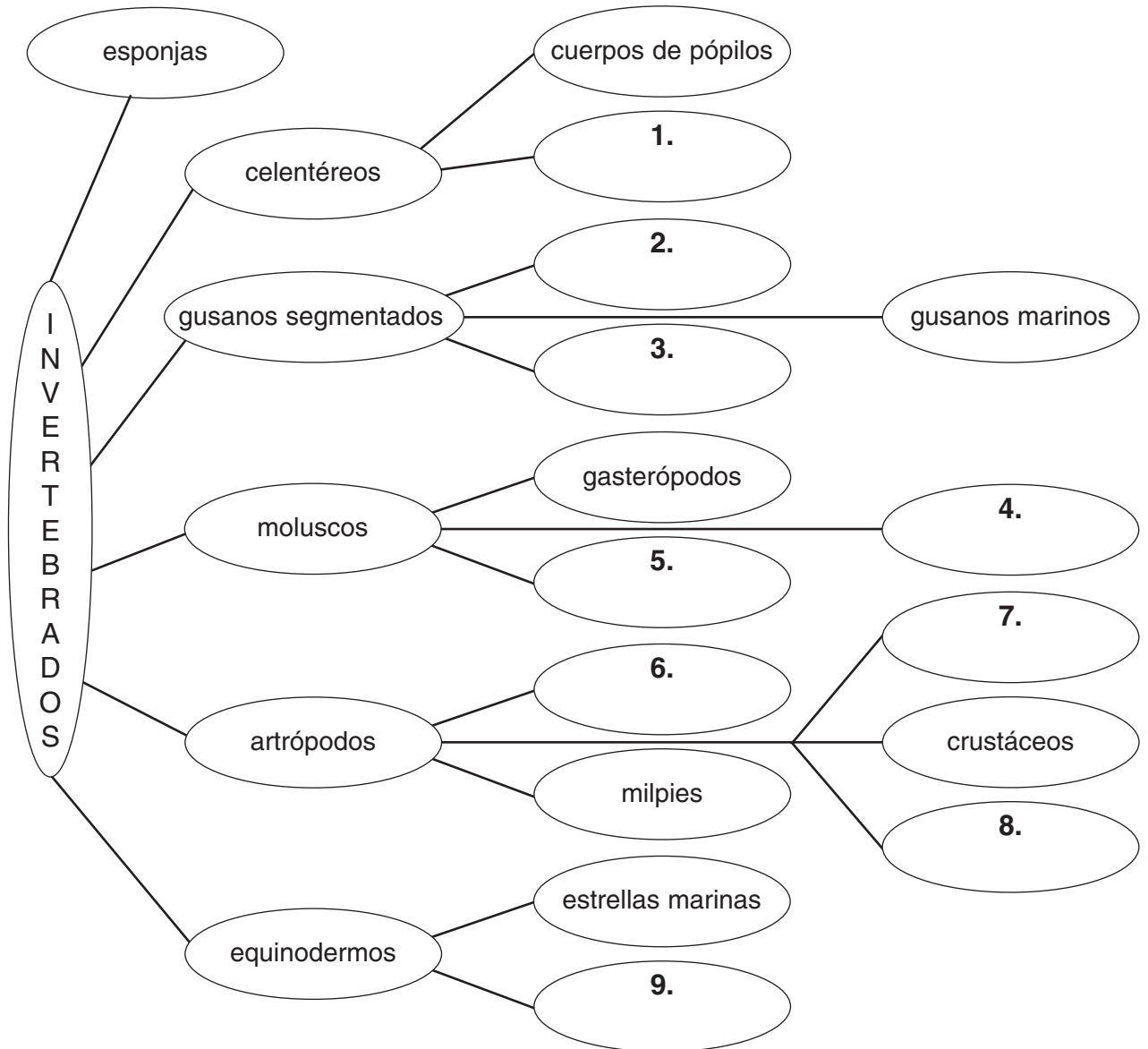


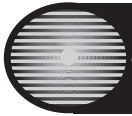
Lectura dirigida para  
Dominio del contenido

# Sinopsis Animales invertebrados

**Instrucciones:** Usa los siguientes términos para completar este mapa de conceptos sobre invertebrados.

- |                     |            |                   |          |
|---------------------|------------|-------------------|----------|
| lombrices de tierra | holoturias | cefalópodos       | insectos |
| sanguijuelas        | arácnidos  | cuerpos de medusa | bivalvos |





Lectura dirigida para  
Dominio del contenido

## Sección 1 ■ Qué es un animal?

## Sección 2 ■ Esponjas, celentéreos platelmintos y ascárides

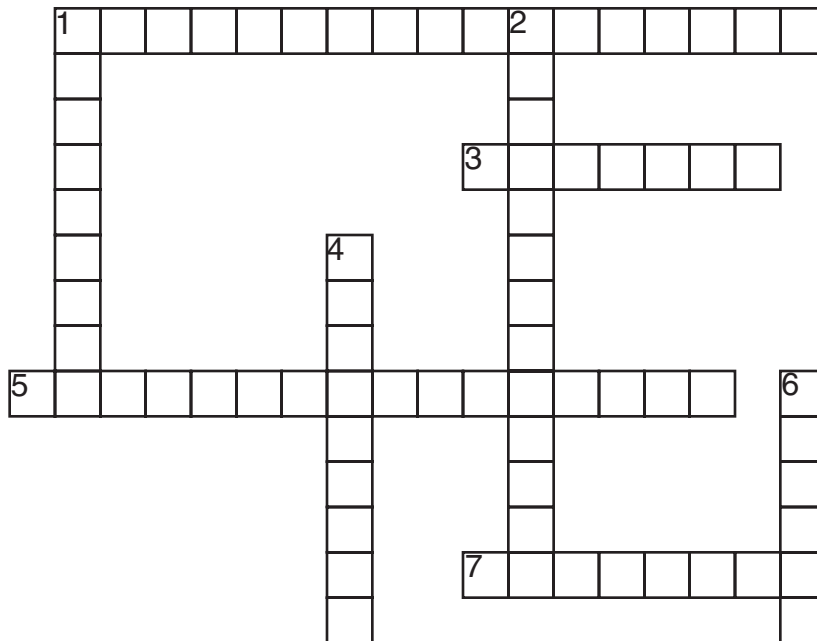
**Instrucciones:** Utiliza la siguiente lista de términos para completar el crucigrama.

células urticantes  
ventosa

parásitos  
cnidarios

invertebrados  
medusa

esponjas  
estrellas marinas

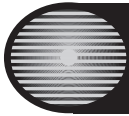


### Horizontales

1. Estructuras que usan las aguamalas para atrapar presas.
3. Parte de la solitaria que le ayuda a adherirse a su huésped.
5. Equinodermos que pueden regenerar partes lesionadas.
7. Animales que permanecen en el mismo lugar y filtran alimento del agua.

### Verticales

1. Las hidras y los corales pertenecen a este grupo de animales.
2. Animales sin columna vertebral.
4. Animales que viven sobre o dentro de otro animal.
6. Otro nombre para la forma de campana de una aguamala.



Lectura dirigida para  
Dominio del contenido

**Sección 3 ■ Moluscos y gusanos segmentados**  
**Sección 4 ■ Artrópodos y equinodermos**

**Instrucciones:** Traza una línea desde el animal hasta el grupo al que pertenece. Hay dos dibujos para cada grupo.

1.

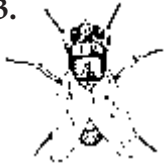


molusco

2.



3.



gusano segmentado

4.



5.



artrópodo

6.



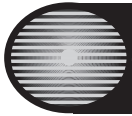
7.



8.



equinodermo



Lectura dirigida para  
Dominio del contenido

## ***Términos claves*** **Animales invertebrados**

**Instrucciones:** *En el espacio de la izquierda, escribe la letra del término que complete correctamente la oración.*

- \_\_\_\_\_ 1. Un animal invertebrado es aquel que no tiene \_\_\_\_\_.
  - a. apéndices
  - b. columna vertebral
- \_\_\_\_\_ 2. \_\_\_\_\_ es la forma de florero del cuerpo de los celentéreos.
  - a. Un pólipo
  - b. Una medusa
- \_\_\_\_\_ 3. Un(a) \_\_\_\_\_ es un organismo que depende de un huésped para su alimentación y refugio.
  - a. parásito
  - b. bivalvo
- \_\_\_\_\_ 4. En un sistema circulatorio \_\_\_\_\_, la sangre fluye dentro de los vasos.
  - a. abierto
  - b. cerrado
- \_\_\_\_\_ 5. La(s) \_\_\_\_\_ es(son) el órgano parecido a una lengua raspante de muchos moluscos.
  - a. branquias
  - b. rádula
- \_\_\_\_\_ 6. La cubierta liviana del cuerpo que protege y sostiene los artrópodos se llama \_\_\_\_\_.
  - a. exoesqueleto
  - b. endoesqueleto
- \_\_\_\_\_ 7. \_\_\_\_\_ son estructuras, como las pezuñas y las garras, que crecen del cuerpo.
  - a. Las antenas
  - b. Los apéndices
- \_\_\_\_\_ 8. El cambio en forma corporal que ocurre en un insecto al madurar se llama \_\_\_\_\_.
  - a. metamorfosis
  - b. alimentación pasiva
- \_\_\_\_\_ 9. Un \_\_\_\_\_ es un invertebrado de cuerpo blando que tiene un manto, una pata muscular y, generalmente, una concha.
  - a. equinodermo
  - b. molusco
- \_\_\_\_\_ 10. Los moluscos acuáticos tienen \_\_\_\_\_ para respirar intercambiando dióxido de carbono por oxígeno.
  - a. branquias
  - b. simetría



**SECTION**  
**1**

**Reinforcement**

**What is an animal?**

**Directions:** Each statement is an example of a characteristic shared by most or all animals. Write the characteristic on the line provided.

1. Sponges filter microscopic organisms from the water for food.

\_\_\_\_\_

2. Enzymes are secreted in an earthworm's digestive tract.

\_\_\_\_\_

3. Gorillas travel many miles in search of food.

\_\_\_\_\_

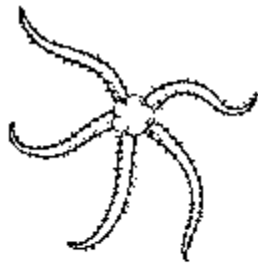
4. The soft body of a mollusk has many different types of tissue.

\_\_\_\_\_

5. Each cell of a jellyfish has a nucleus surrounded by a membrane.

\_\_\_\_\_

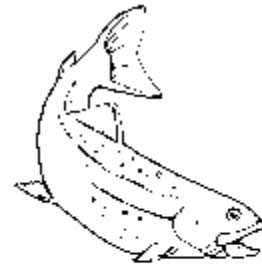
**Directions:** Describe each animal shown below by using one of the following terms: **radial symmetry**, **bilateral symmetry**, or **no symmetry**.



6. \_\_\_\_\_



7. \_\_\_\_\_



8. \_\_\_\_\_



9. \_\_\_\_\_



10. \_\_\_\_\_



11. \_\_\_\_\_

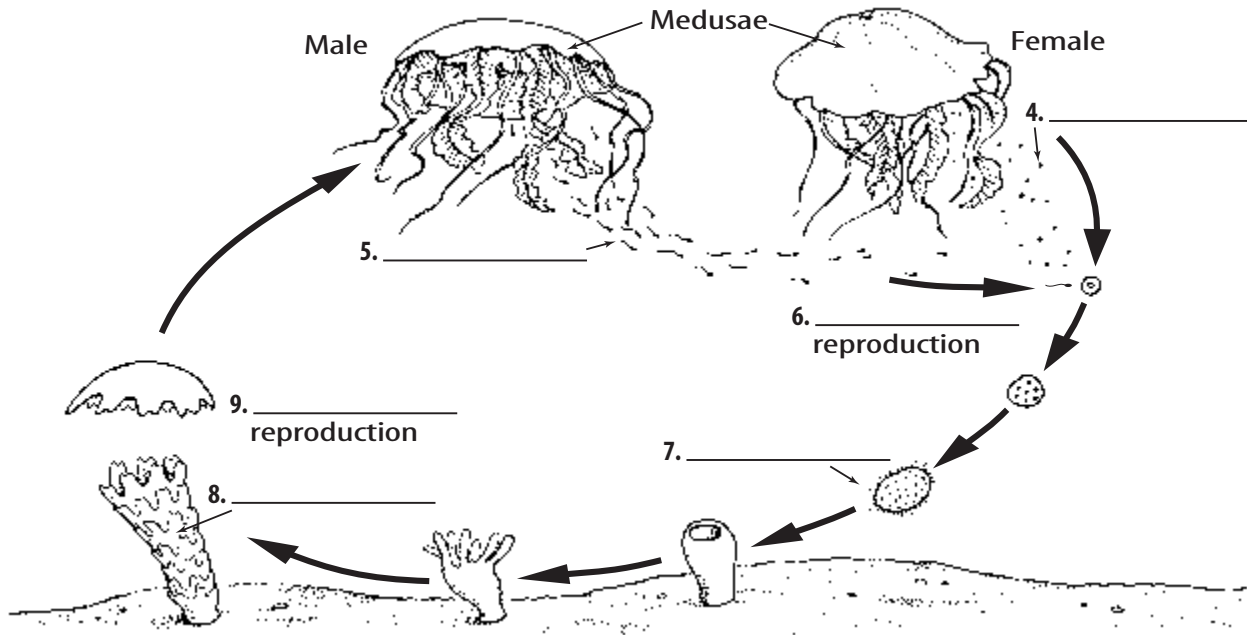
**SECTION**  
**2** Reinforcement

# Sponges, Cnidarians, Flatworms, and Roundworms

**Directions:** Define the underlined term on the lines provided.

1. Sponges are sessile animals. \_\_\_\_\_
2. Sponges are filter feeders. \_\_\_\_\_
3. Spicules support and protect a sponge's body. \_\_\_\_\_

**Directions:** Study the following diagram. Fill in the blanks with the correct terms.



**Directions:** Answer the following questions on the lines provided.

10. The word *cnidarian* means “stinging cells.” Why is this a good name for this group?  
\_\_\_\_\_  
\_\_\_\_\_
11. Explain the difference between a free-living and a parasitic flatworm. \_\_\_\_\_  
\_\_\_\_\_
12. Describe a roundworm. \_\_\_\_\_  
\_\_\_\_\_

Meeting Individual Needs

**SECTION**  
**3****Reinforcement****Mollusks and  
Segmented Worms**

**Directions:** Answer the following questions on the lines provided.

1. Define the following groups of animals and give an example of each.
  - a. mollusks \_\_\_\_\_
  - b. gastropods \_\_\_\_\_
  - c. bivalves \_\_\_\_\_
  - d. cephalopods \_\_\_\_\_
2. What is the difference between an open and a closed circulatory system?
  - a. open circulatory system \_\_\_\_\_
  - b. closed circulatory system \_\_\_\_\_
3. Many mollusks gather food with a radula, but bivalves are filter-feeders. Explain the difference between the two types of feeding.  
\_\_\_\_\_  
\_\_\_\_\_
4. Describe the way in which squids and octopuses move through the water.  
\_\_\_\_\_  
\_\_\_\_\_
5. Why is the segmented structure of segmented worms important?  
\_\_\_\_\_  
\_\_\_\_\_
6. Describe the following structures in earthworms.
  - a. coelom \_\_\_\_\_
  - b. setae \_\_\_\_\_
7. What is unique about the earthworm's diet and skin?  
\_\_\_\_\_
8. Leeches are parasites. How do they eat?  
\_\_\_\_\_
9. How are marine worms different from earthworms?  
\_\_\_\_\_  
\_\_\_\_\_

**SECTION**  
**4****Reinforcement****Arthropods and  
Echinoderms**

**Directions:** Answer the following questions on the lines provided.

1. Arthropods have appendages instead of setae. What different kinds of appendages do they have?

\_\_\_\_\_

2. What is the main difference between centipedes and millipedes?

\_\_\_\_\_

3. What is attached to an insect's thorax? \_\_\_\_\_

4. In insects, what does the blood transport? What is not transported by the blood?

\_\_\_\_\_

5. What are the four stages of complete metamorphosis?

\_\_\_\_\_

6. If spiders cannot chew, how can they eat?

\_\_\_\_\_

\_\_\_\_\_

7. Why is a large heavy exoskeleton less limiting for arthropods that live in water?

\_\_\_\_\_

\_\_\_\_\_

8. Describe how a sea star feeds on a clam.

\_\_\_\_\_

\_\_\_\_\_

9. What happens if a sea star loses an arm?

\_\_\_\_\_

10. Why are echinoderms important to the marine environment?

\_\_\_\_\_

\_\_\_\_\_

11. What functions do tube feet serve in an echinoderm such as a sea star?

\_\_\_\_\_

\_\_\_\_\_

# SECTION 1

## Enrichment

# Looking at Animal Characteristics

**Directions:** Your textbook names five characteristics that all animals have in common. Prove to yourself that together, these characteristics define only animals. First, briefly write a description of each characteristic. Then, fill in the table of living things by writing **yes** or **no** in each box, depending on whether that living thing has that characteristic.

1. Characteristic 1: \_\_\_\_\_
2. Characteristic 2: \_\_\_\_\_
3. Characteristic 3: \_\_\_\_\_
4. Characteristic 4: \_\_\_\_\_
5. Characteristic 5: \_\_\_\_\_

**Note:** When completing the table below, you may want to look at other chapters in your textbook or consult an encyclopedia.

**Table 1**

Living thing	Characteristics				
	1	2	3	4	5
6. kelp					
7. bacterium					
8. bird					
9. dog					
10. fern					
11. fish					
12. flatworm					
13. insect					
14. jellyfish					
15. lobster					
16. mushroom					
17. paramecium					
18. snail					
19. tree					

20. Which organisms are animals? \_\_\_\_\_

\_\_\_\_\_

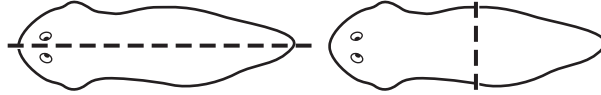
## SECTION 2

### Enrichment

# Planarian Regeneration

## Materials

large wide-mouth jar  
magnifying glass  
pond water  
art knife  
spring water at room temperature  
cooked egg yolks or raw meat



## Procedure



1. Planarians can be found near the shoreline of ponds that have decaying leaves and other debris. Fill your wide-mouth jar with this shoreline material and a few inches of pond water.
2. Let the jar sit overnight. In the morning, planarians will likely be clinging to the side of the jar. Planarians look like small, dark, jelly-like blobs. Remove much of the shoreline material, and add some more pond water.
3. Using the magnifying glass and art knife, carefully cut two planarians in half as shown above.

**WARNING:** *The art knife is very sharp. Be careful when using sharp objects. Wash your hands thoroughly after handling the worms. Return cut planarians to the jar.*

4. Once a day, feed the planarians some egg yolk or raw meat. After about an hour, remove the remaining yolk or meat, drain as much of the water away as possible, and replace with fresh pond water or bottled spring water.
5. Observe the planarian parts for a week and then return them to the pond.

## Data and Observations

What do your planarian parts look like after a week? \_\_\_\_\_

\_\_\_\_\_

## Conclude and Apply

1. Why did the planarian parts change?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. How would regeneration affect the planarian population? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# SECTION 3

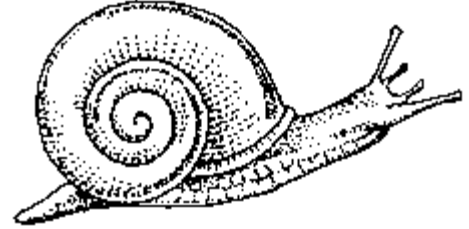
## Enrichment

# Snail Behavior

As you know from your textbook, snails are a type of mollusk in the class known as gastropods. Snails like damp, dark environments and can be found under leaves and near rotting logs. When searching for snails, go to a natural area in a park or woodlot. Use gloves when picking up snails. Handle them gently.

### Materials

old aquarium or wide-mouthed jar  
snails  
glass top for aquarium or jar lid with holes  
fresh lettuce



### Procedure

1. Search for snails near a rotting log. Turn over moist logs, boards, or leaves.
2. Place the snails into an aquarium or jar along with woodland materials. Punch holes in the top of the jar for air, or place a glass top over the aquarium leaving a small opening for air.
3. Feed the snails fresh lettuce every day.
4. Observe the snails eating.
5. Watch for snail activity during daytime hours and nighttime hours.
6. For one 24-hour period, place the jar or aquarium into a dark closet during the day and shine a strong light onto the environment all night long. Observe the snails' activity.
7. When your observations are completed, return the snails to their natural environments.

### Data and Observations

1. How fast does a snail move? \_\_\_\_\_  
\_\_\_\_\_
2. How long does it take a snail to eat a leaf of lettuce? \_\_\_\_\_
3. Were the snails more active during the day or night? \_\_\_\_\_
4. What happened when you changed the pattern of light? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. From your observations, would you conclude that snails in their natural environment are more active at night or during the day? \_\_\_\_\_

## SECTION 4

### Enrichment

# Crickets

A common arthropod of the insect class is the cricket, a small bug with antennae, wings, and powerful hind legs. The word cricket comes from a French word meaning “to click or creak.” Anyone who has had a cricket in the house has heard their noise-making abilities. Crickets can easily be found from spring through fall in fields and vacant lots. They can also be purchased at pet stores or at bait stores that sell fishing supplies.

### Materials



cricket(s)

wide-mouthed, clear glass jar

old nylon stocking

scissors

rubber band

indoor thermometer

clock with second hand

### Procedure

1. Catch a cricket in a field or buy one from a pet or bait store.
  2. Place the cricket in the jar. Cut a top for the jar from the old nylon stocking. Secure the cover with the rubber band.
  3. Observe the cricket’s body parts and make a sketch of the arthropod. Label your sketch with these terms: head, thorax, abdomen.
  4. Place an indoor thermometer near the jar. Record the temperature of the room.
  5. Wait until the cricket is chirping regularly.
- While watching the second hand of the clock, count how many chirps the cricket makes in 15 seconds. Add 40 to the number of chirps you counted. Compare the sum to the temperature of the room.
6. Move the jar and thermometer to a warmer place (near a sunny window, for example). Make your count again.
  7. When your observations are completed, return the crickets to their natural environment.

### Data and Observations

**Directions:** *Make a sketch of your cricket in the space below. Label the parts.*

### Conclude and Apply

1. How did the sum of the number of chirps compare with the temperature reading?

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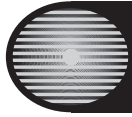
2. What happened to the number of chirps when you moved the jar to a warmer place?

---

3. How does temperature affect cricket activity?

---



**Note-taking  
Worksheet****Invertebrate Animals****Section 1 What is an animal?**

A. Animal characteristics—\_\_\_\_\_ features

1. Composed of many eukaryotic \_\_\_\_\_, must find and digest their own \_\_\_\_\_, and usually can \_\_\_\_\_
2. \_\_\_\_\_—arrangement of parts
  - a. \_\_\_\_\_ symmetry—parts are arranged in a circle around a central point
  - b. \_\_\_\_\_ symmetry—parts are mirror images of each other
  - c. \_\_\_\_\_—no definite shape

B. Animal classification—placed into \_\_\_\_\_ groups

1. \_\_\_\_\_—animals with a backbone
2. \_\_\_\_\_—majority of animals which lack a backbone

**Section 2 Sponges, Cnidarians, Flatworms, and Roundworms**

A. Sponges—don't move to find food since adults are \_\_\_\_\_ or stuck in one place

1. Filter \_\_\_\_\_—filter food out of water that flows through body
  - a. \_\_\_\_\_ let water into central cavity.
  - b. \_\_\_\_\_ keep water moving through sponge.
2. Soft sponge bodies are protected by sharp \_\_\_\_\_ or rubbery \_\_\_\_\_.
3. Sponges \_\_\_\_\_ sexually and asexually.
  - a. In \_\_\_\_\_ reproduction a new sponge grows from pieces of an old sponge
  - b. Most sexually reproducing sponges are \_\_\_\_\_, producing both eggs and sperm.

B. \_\_\_\_\_—have tentacles and hollow bodies

1. Two \_\_\_\_\_ shapes
  - a. \_\_\_\_\_ cnidarians are usually sessile and have vase-shaped bodies
  - b. A \_\_\_\_\_ body is free-swimming and bell-shaped
2. Cnidarians \_\_\_\_\_ both sexually and asexually.
  - a. Polyp forms reproduce asexually by \_\_\_\_\_.
  - b. Some polyps also reproduce sexually by releasing \_\_\_\_\_ or \_\_\_\_\_.
  - c. Medusa forms have a \_\_\_\_\_-stage life cycle in which they reproduce both sexually and asexually.

## Note-taking Worksheet (continued)

C. Flatworms—\_\_\_\_\_ for their food

1. Have long, flattened bodies with \_\_\_\_\_ and systems
2. Most are \_\_\_\_\_ living off or in a host.
3. \_\_\_\_\_—a type of flatworm
  - a. Lack a \_\_\_\_\_ system and absorb nutrients from the host's intestines
  - b. Tapeworms reproduce \_\_\_\_\_.

D. \_\_\_\_\_—very common animals

1. Body is a \_\_\_\_\_ within a tube.
2. \_\_\_\_\_ has both a mouth and an anus.
3. \_\_\_\_\_ vary with some roundworms being decomposers, some predators, and some parasites.

### Section 3 Mollusks and Segmented Worms

A. Characteristics of \_\_\_\_\_—invertebrates usually with shells protecting their soft bodies, mantle, and muscular foot

1. \_\_\_\_\_—tissue that covers a mollusk's soft body and that may produce a shell
2. Lungs or \_\_\_\_\_ exchange carbon dioxide from the animal for oxygen in the air or water.
3. Many mollusks use a \_\_\_\_\_, a scratchy tongue-like organ, to help them eat
4. Some mollusks have an \_\_\_\_\_ **circulatory system** which washes blood over organs and lacks blood vessels.

B. Types of Mollusks

1. \_\_\_\_\_—most have \_\_\_\_\_ shell
  - a. Live in \_\_\_\_\_ or on \_\_\_\_\_
  - b. Move by gliding their large muscular foot across a trail of \_\_\_\_\_
2. \_\_\_\_\_—have two shells
  - a. Large \_\_\_\_\_ open and close shell halves
  - b. Water animals that \_\_\_\_\_
  - c. Use \_\_\_\_\_ to remove foot from water
3. \_\_\_\_\_—have no shell
  - a. Have a foot divided into \_\_\_\_\_ with suckers
  - b. Move by using a mantle to quickly squeeze water through a funnel-like \_\_\_\_\_
  - c. Have a \_\_\_\_\_ **circulatory system** with blood vessels

**Note-taking Worksheet** (continued)

C. Segmented Worms—also called \_\_\_\_\_, have repeating segments, a closed circulatory system, and digest food in a complete system with two openings

1. \_\_\_\_\_—have more than 100 body segments
  - a. Use external bristle-like \_\_\_\_\_ and muscles to move
  - b. Eat organic \_\_\_\_\_ in soil
  - c. Exchange carbon dioxide and oxygen through mucus-covered \_\_\_\_\_
2. \_\_\_\_\_—have flat bodies with sucking disks at both ends
  - a. Attach to animals and remove \_\_\_\_\_ for food
  - b. Can \_\_\_\_\_ enormous amounts of food for months
3. \_\_\_\_\_—use bristles or setae for moving
  - a. Some marine worms are \_\_\_\_\_ feeders.
  - b. Some eat \_\_\_\_\_ or rotting material.
  - c. Some marine worms are predators or \_\_\_\_\_.

**Section 4 Arthropods and Echinoderms**

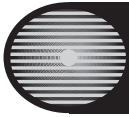
A. \_\_\_\_\_—have **appendages** such as claws, legs, and antennae plus an **exoskeleton**

1. Insects—such as ants have three body regions called the head, the \_\_\_\_\_, and the abdomen
  - a. Open circulatory system transports food and waste but \_\_\_\_\_ gather oxygen.
  - b. Insects change body form in process called \_\_\_\_\_.
2. \_\_\_\_\_—such as spiders have two body regions called the cephalothorax and the abdomen plus four pairs of legs
3. Centipedes and millipedes—long, thin, segmented animals
  - a. \_\_\_\_\_—predators with one pair of jointed legs per segment
  - b. \_\_\_\_\_—plant eaters with two pairs of jointed legs per segment
4. \_\_\_\_\_—water animals such as lobsters usually having two pairs of antennae, three types of chewing appendages, and five pairs of legs

B. \_\_\_\_\_—have radial symmetry

1. \_\_\_\_\_ vary—some are predators, some are filter feeders, some eat rotting material
2. Echinoderms have \_\_\_\_\_ skin covering an internal skeleton of plates.
3. Echinoderms have a \_\_\_\_\_ system to help them move and eat.
4. Some echinoderms can reproduce through \_\_\_\_\_ from parts.

# Assessment

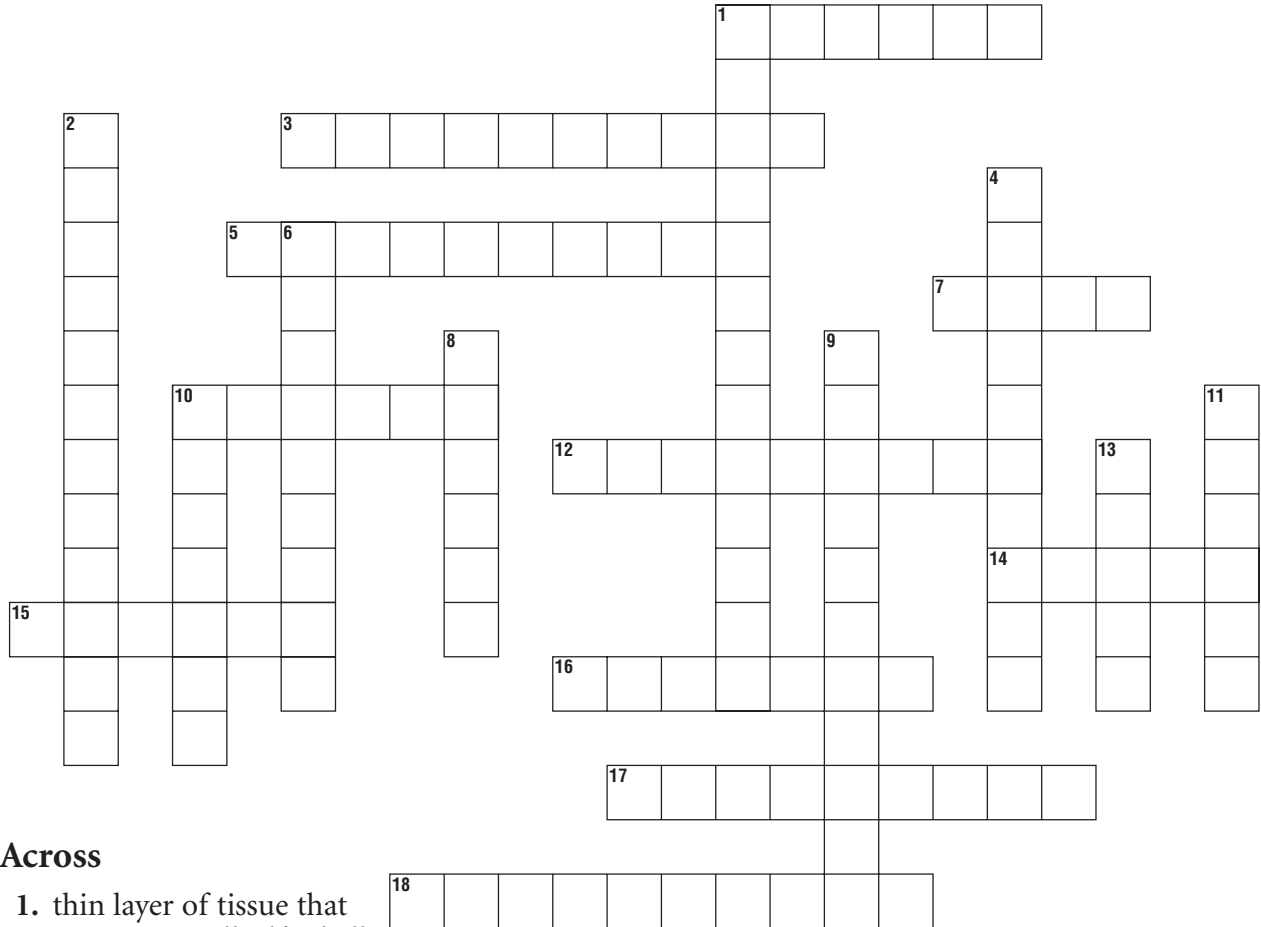


## Chapter Review

# Invertebrate Animals

### Part A. Vocabulary Review

**Directions:** Use the clues below to complete the crossword puzzle.



#### Across

1. thin layer of tissue that secretes a mollusk's shell
3. an animal with a backbone
5. spiny-skinned invertebrate that lives on the ocean bottom
7. circulatory system in which blood is not in vessels but surrounds organs
10. bell-shaped body plan, like that of a jellyfish
12. joint-footed animal
14. organs that exchange oxygen and carbon dioxide with water
15. tongue-like organ in mollusks that works like a file
16. remaining attached to one place
17. type of symmetry in which body parts are mirror images of each other
18. describing an organism that does not depend on another for food or a place to live

#### Down

1. change in body form some animals go through as they mature
2. an animal without a backbone
4. structures, like legs or antennae, that grow out from a body
6. hollow-bodied animal that has stinging cells
8. type of symmetry in which body parts are arranged in a circle around a central point
9. protective outer covering on arthropods
10. soft-bodied invertebrate usually with a shell
11. circulatory system in which blood is contained in vessels
13. vase-shaped body plan, like that of a hydra

## Chapter Review (continued)

### Part B. Concept Review

**Directions:** *List five characteristics of animals.*

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

**Directions:** *Use the following groups to classify the animals listed below.*

annelid	arthropod	cnidarian
mollusk	flatworm	echinoderm
_____ 6. sea anemone	_____ 12. lobster	
_____ 7. planarian	_____ 13. squid	
_____ 8. scorpion	_____ 14. sea star	
_____ 9. earthworm	_____ 15. jellyfish	
_____ 10. oyster	_____ 16. grasshopper	
_____ 11. sea cucumber	_____ 17. leech	

**Directions:** *Answer the following questions on the lines provided.*

18. How is a crustacean different from a gastropod? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

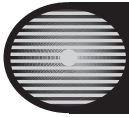
19. Compare the body plan, symmetry, and feeding methods of cnidarians and roundworms.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Chapter Test

# Invertebrate Animals

## I. Testing Concepts

**Directions:** Match the terms in Column II with the descriptions in Column I. Write the letter of the correct term in the blank at the left. Some terms may not be used.

### Column I

- \_\_\_\_\_ 1. soft-bodied invertebrates that usually have shells
- \_\_\_\_\_ 2. animal without a backbone
- \_\_\_\_\_ 3. structures that grow out from the body
- \_\_\_\_\_ 4. body parts arranged around a central point
- \_\_\_\_\_ 5. invertebrates with jointed legs
- \_\_\_\_\_ 6. change in form some animals go through as they develop and mature
- \_\_\_\_\_ 7. body plan that is shaped like a tube or vase
- \_\_\_\_\_ 8. spiny-skinned invertebrates that live on the ocean bottom
- \_\_\_\_\_ 9. body plan that is bell-shaped

### Column II

- a. appendages
- b. arthropods
- c. bilateral symmetry
- d. echinoderms
- e. free-living
- f. invertebrate
- g. medusa
- h. metamorphosis
- i. mollusks
- j. molting
- k. polyp
- l. radial symmetry
- m. sessile
- n. vertebrate

**Directions:** In the blank at the left, write the letter of the term that best completes each sentence.

- \_\_\_\_\_ 10. An animal with \_\_\_\_\_ has identical body parts on both sides of its body.
  - a. asymmetrical form
  - b. bilateral symmetry
  - c. radial symmetry
  - d. spherical symmetry
- \_\_\_\_\_ 11. The body of a sponge is covered with small openings called \_\_\_\_\_.
  - a. swimmerets
  - b. setae
  - c. flagella
  - d. pores
- \_\_\_\_\_ 12. A system in which blood is **NOT** contained in vessels, but spreads over the organs is a(n) \_\_\_\_\_.
  - a. closed circulatory system
  - b. fluid-filled system
  - c. open circulatory system
  - d. water-vascular system
- \_\_\_\_\_ 13. Like mollusks, segmented worms have a \_\_\_\_\_.
  - a. complete digestive system
  - b. setae
  - c. mantle cavity
  - d. siphon
- \_\_\_\_\_ 14. Early scientists classified sponges as \_\_\_\_\_.
  - a. fungi
  - b. parasites
  - c. plants
  - d. protists
- \_\_\_\_\_ 15. Unlike other arthropods, arachnids have \_\_\_\_\_ legs.
  - a. 4
  - b. 6
  - c. 8
  - d. 10

**Chapter Test (continued)**

- \_\_\_\_\_ 16. Bivalves are different from other mollusks because they have \_\_\_\_\_.  
a. no shell                      b. two shells                      c. a muscular foot                      d. 2 muscular feet
- \_\_\_\_\_ 17. Many mollusks have a \_\_\_\_\_, a tongue-like organ that works like a file.  
a. crop                      b. radula                      c. polyp                      d. spiracle
- \_\_\_\_\_ 18. Heartworm is a disease in dogs caused by \_\_\_\_\_.  
a. flatworms                      b. planarians                      c. roundworms                      d. tapeworms
- \_\_\_\_\_ 19. All cnidarians have \_\_\_\_\_.  
a. asymmetrical form                      c. radial symmetry  
b. bilateral symmetry                      d. spherical symmetry
- \_\_\_\_\_ 20. Water-dwelling mollusks have \_\_\_\_\_ in the mantle cavity.  
a. gills                      b. radula                      c. lungs                      d. flagella
- \_\_\_\_\_ 21. Mollusks are **NOT** classified according to \_\_\_\_\_.  
a. the kind of foot they have                      c. the kind of shell they have  
b. whether they have a shell                      d. how they reproduce
- \_\_\_\_\_ 22. \_\_\_\_\_ make up the largest group of complex invertebrates.  
a. Arachnids                      b. Insects                      c. Annelids                      d. Crustaceans
- \_\_\_\_\_ 23. Because the blood of earthworms and cephalopods is contained in vessels, they have a(n) \_\_\_\_\_.  
a. closed circulatory system                      c. open circulatory system  
b. fluid-filled system                      d. water-vascular system
- \_\_\_\_\_ 24. The bodies of many sponges contain sharp structures called \_\_\_\_\_.  
a. spiracles                      b. pores                      c. collar cells                      d. spicules
- \_\_\_\_\_ 25. Sponges reproduce \_\_\_\_\_.  
a. only asexually                      c. only sexually  
b. only by regeneration                      d. asexually and sexually
- \_\_\_\_\_ 26. Segmented worms have bristle-like structures called \_\_\_\_\_ that help them move.  
a. gills                      b. appendages                      c. setae                      d. tube feet
- \_\_\_\_\_ 27. Flatworms and roundworms have \_\_\_\_\_.  
a. asymmetrical form                      c. radial symmetry  
b. bilateral symmetry                      d. spherical symmetry
- \_\_\_\_\_ 28. Echinoderms have a(n) \_\_\_\_\_ that allows them to move, eat, get oxygen, and get rid of wastes.  
a. cephalothorax                      c. water-vascular system  
b. tube within a tube digestive system                      d. exoskeleton
- \_\_\_\_\_ 29. All arthropods have \_\_\_\_\_.  
a. antennae                      b. spiny skin                      c. 3 body segments                      d. jointed legs
- \_\_\_\_\_ 30. Polyp forms of cnidarians can reproduce \_\_\_\_\_.  
a. asexually and sexually                      c. only sexually  
b. by budding                      d. by regeneration



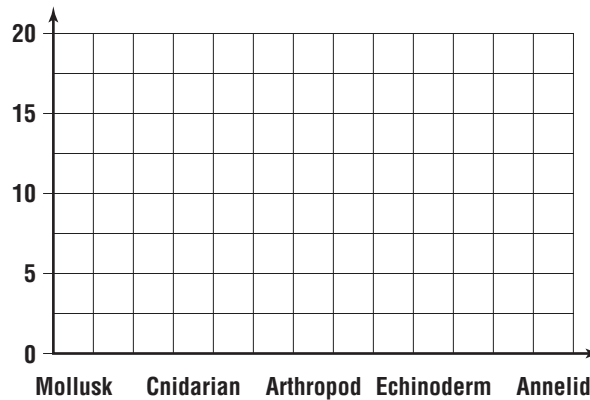
## Chapter Test (continued)

### II. Understanding Concepts

#### Skill: Graphing

**Directions:** Enter the data in the graph provided.

On a field trip, a group of students collected the following invertebrates: 3 hydra, 4 snails, 10 earthworms, 2 butterflies, 1 sand dollar, 3 spiders, 6 slugs, 5 corals, and 2 centipedes. They added these to the 4 jellyfish, 3 sea anemones, 1 sea star, 6 leeches, 1 crayfish, 4 marine worms, and 2 clams they already had in class. Use the axes below to draw a bar graph showing the total number of organisms belonging to each group shown.



#### Skill: Comparing and Contrasting

**Directions:** Write whether the descriptions below are of a **flatworm** or a **roundworm**.

- \_\_\_\_\_ 1. tube within a tube body
- \_\_\_\_\_ 2. tapeworms
- \_\_\_\_\_ 3. long, flattened body
- \_\_\_\_\_ 4. digestive tract has mouth and anus
- \_\_\_\_\_ 5. heartworms
- \_\_\_\_\_ 6. lacks a digestive system

#### Skill: Interpreting Scientific Illustrations

**Directions:** Label the parts of the insect shown below.



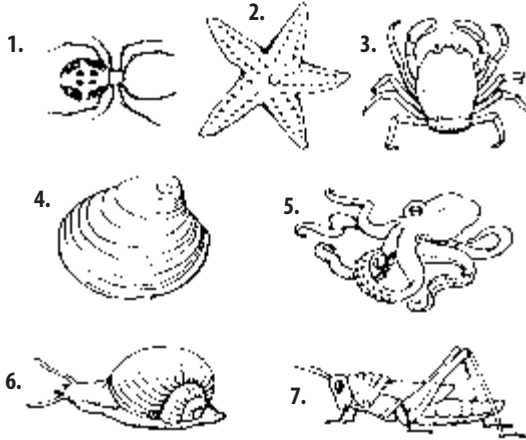
## Chapter Test (continued)

### III. Applying Concepts

**Directions:** Match each organism shown below with a term in Column II. Write the correct letter in the blank at the left.

#### Column I

- \_\_\_\_\_ 1.  
 \_\_\_\_\_ 2.  
 \_\_\_\_\_ 3.  
 \_\_\_\_\_ 4.  
 \_\_\_\_\_ 5.  
 \_\_\_\_\_ 6.  
 \_\_\_\_\_ 7.



#### Column II

- a. gastropod mollusk  
 b. arachnid arthropod  
 c. bivalve mollusk  
 d. cephalopod mollusk  
 e. crustacean arthropod  
 f. echinoderm  
 g. insect arthropod

**Directions:** List the four stages of metamorphosis a butterfly undergoes in the order of development.

8. \_\_\_\_\_ 10. \_\_\_\_\_  
 9. \_\_\_\_\_ 11. \_\_\_\_\_

**Directions:** List the three stages of metamorphosis a grasshopper undergoes in the order of development.

12. \_\_\_\_\_ 14. \_\_\_\_\_  
 13. \_\_\_\_\_

### IV. Writing Skills

**Directions:** Answer the following question in complete sentences on the lines provided.

1. What is the difference between a free-living organism and a parasitic organism?

\_\_\_\_\_  
 \_\_\_\_\_

2. Suppose you found a strange new creature that seemed to be growing out of the ocean floor. Describe what characteristics would determine whether it was an animal.

\_\_\_\_\_  
 \_\_\_\_\_

3. Describe how a sea star gets and digests food.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# Transparency Activities

## SECTION

## 1

Section Focus  
Transparency Activity

## Jelly Sea

Jellyfish are interesting animals whose bodies are comprised mostly of water. They drift with the currents, but they are also able to move by expelling a jet of water.



1. How are jellyfish similar to you? How are they different?
2. Describe a jellyfish's shape.
3. Why are jellyfish classified as animals?

**SECTION**  
**2****Section Focus**  
**Transparency Activity****Rub-a-dub-dub**

When you clean something with a sponge, you may be using the skeleton of an animal! People harvest sponges in areas like the Mediterranean Sea and the Gulf Stream. Most sponges you buy in stores, however, aren't animals at all; they're artificial sponges.



1. Why might scientists have originally thought sponges were plants?
2. How do animals get food? How do plants get food?

**SECTION**  
**3****Section Focus**  
**Transparency Activity****I'll have one for dinner.**

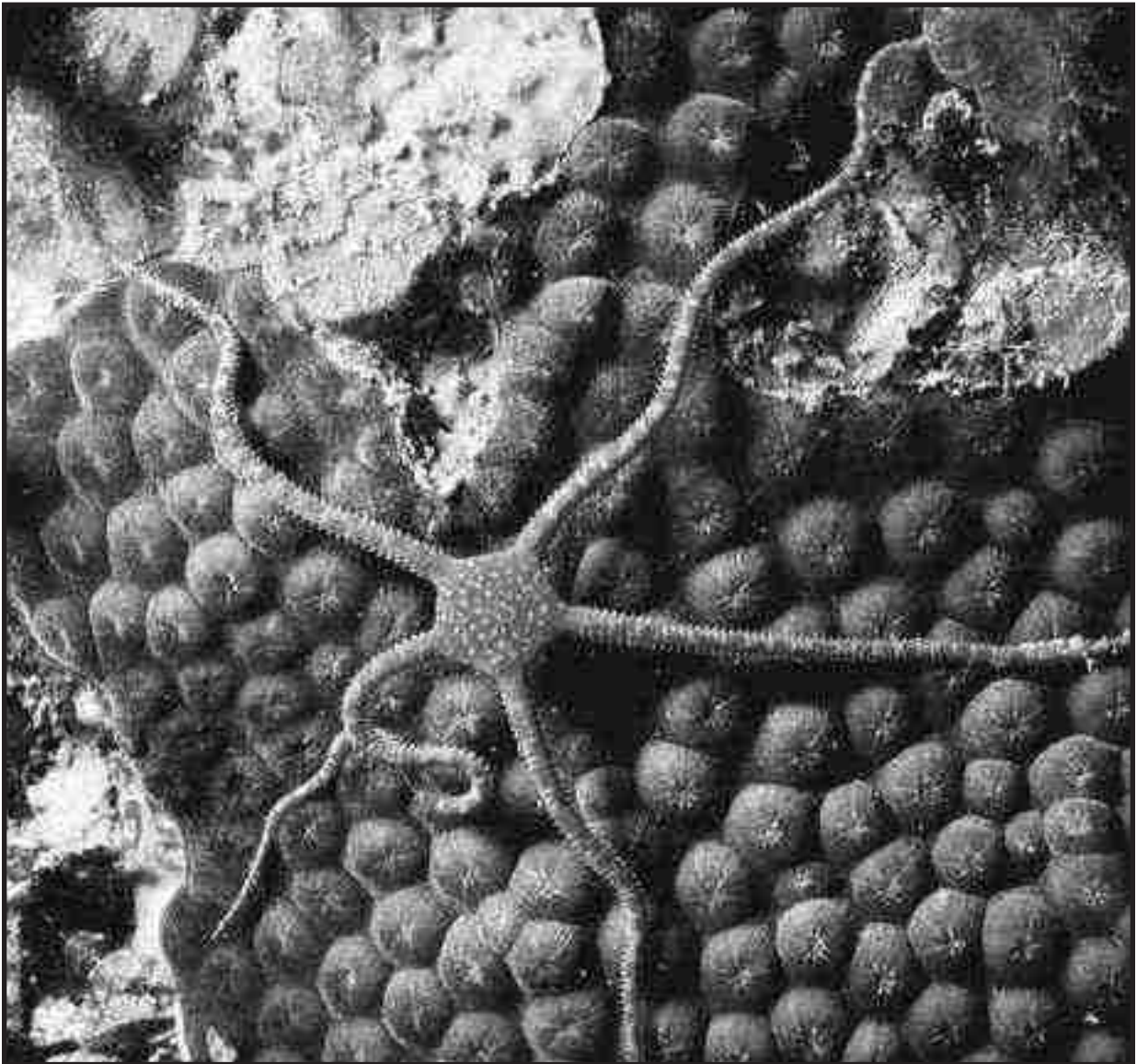
One thing these animals have in common is they're occasionally served as dinner. Food is one way people use them, but they are also important for other reasons. For example, some of these creatures live in the sea near the shore and filter large amounts of water each day.



1. What similarities do these three animals share?
2. Describe some of the differences among the three animals.

**SECTION**  
**4****Section Focus**  
**Transparency Activity****Olfactory Feet**

This fascinating sea creature is a brittle star. It has tube feet, which are located on its arms, that smell. Not that they stink, but the brittle star can use its feet to sense different aromas as well as light.



1. What other animals are similar to the brittle star?
2. How do you think brittle stars feed?
3. What do you notice about the skin of the brittle star?

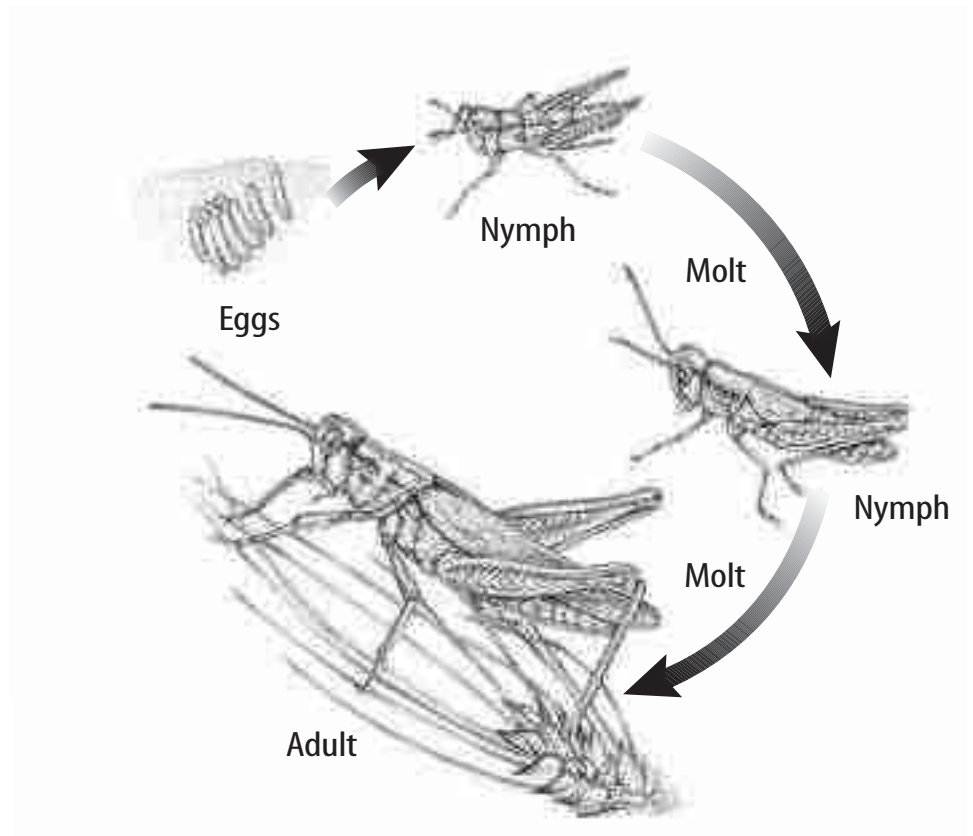
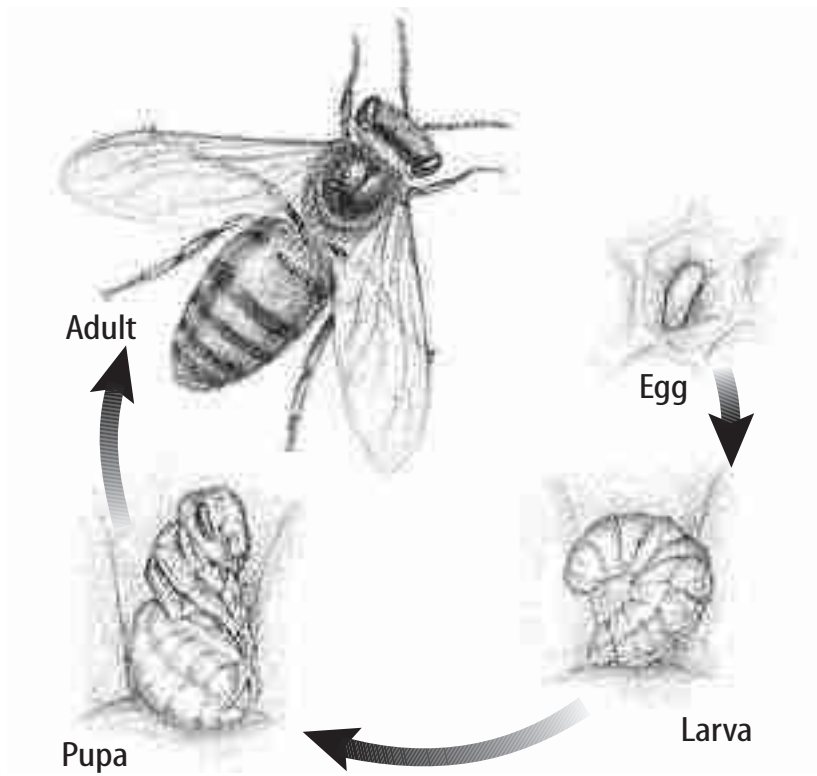




**SECTION**  
**4**

**Teaching Transparency**  
**Activity**

# Metamorphosis



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**Teaching Transparency Activity (continued)**

1. Describe the stages of incomplete metamorphosis.

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2. Describe the stages of complete metamorphosis.

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3. What is a nymph?

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4. What is the third stage of a bee's metamorphosis?

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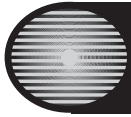
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5. Name five insects that undergo complete metamorphosis.

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## Assessment Transparency Activity

# Invertebrate Animals

**Directions:** Carefully review the table and answer the following questions.

Animals Collected from Tidal Pool				
Animal	Body symmetry	Motility	Mode of feeding	Vertebrae
Sponge	Asymmetrical	None	Filtration	None
Sand worm	Bilateral	Medium	Predation	None
Crab	Bilateral	High	Predation	None
Sea star	Radial	Medium	Predation	None
Flatworm	Bilateral	Low	Predation	None

- According to the table, which characteristic do these animals have in common?
  - All are invertebrates.
  - All are mollusks.
  - All are motile.
  - All are predators.
- According to the table, all of the following animals exhibit bilateral symmetry EXCEPT \_\_\_\_\_.
 

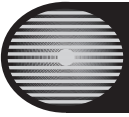
F flatworm	H sandworm
G crab	J sea star
- According to the table, the animal with the LEAST motility is probably the \_\_\_\_\_.
  - sandworm
  - sponge
  - flatworm
  - sea star



# Teacher Support and Planning

## Teacher Support and Planning

Content Outline for Teaching .....	T2
Spanish Resources .....	T6
Teacher Guide and Answers.....	T10



Content Outline  
for Teaching

# Invertebrate Animals

## Section 1 What is an Animal?

Underlined words and phrases are to be filled in by students on the corresponding page.

### Animal Characteristics—similar features

Composed of many eukaryotic cells, must find and digest their own food, and usually can move.

### Symmetry—arrangement of parts

- Radial symmetry—parts are arranged in a circle around a central point
- Bilateral symmetry—parts are mirror images of each other
- Asymmetrical—no definite shape

### Animal Classification—placed into related groups

- Vertebrates—animals with a backbone
- Invertebrates—majority of animals which lack a backbone

### DISCUSSION QUESTION

Why do all animals need to move? *find food, shelter, a mate, or escape from danger.*

## Section 2 Sponges, Cnidarians, Flatworms, and Roundworms

### Sponges—don't move to find food since adults are sessile or stuck in one place

Filter feeders—filter food out of water that flows through body

- Draw in water into central cavity
- Expel out open water moving through sponge

Soft sponge bodies are protected by sharp spicules or rubbery spongin.

### Sponges reproduce sexually and asexually

- In asexual reproduction a new sponge grows from pieces of an old sponge
- Most sexually reproducing sponges are hermaphrodites producing both eggs and sperm.

### Cnidarians—have tentacles and hollow bodies

- Two body types
  - Polyp: Cnidarians are usually sessile and have vase-shaped bodies
  - Medusa: body is free-swimming and bell-shaped

## Content Outline for Teaching (continued)

- **Cnidarians reproduce** both sexually and asexually
  - **Polyp forms reproduce asexually by budding**
  - **Some polyps also reproduce sexually by releasing sperm or eggs**
  - **Medusa forms have a two-stage life cycle in which they reproduce both sexually and asexually**
- **Flatworms—search for their food**
  - **Have long, flattened bodies with organs and systems**
  - **Most are parasitic, living off or in a host**
  - **Tapeworms—a type of flatworm**
    - **Lack a digestive system and absorb nutrients from the host's intestine**
    - **Tapeworms reproduce sexually**
- **Roundworms—very common animals**
  - **Body is a tube within a tube**
  - **Digestive tract has both a mouth and an anus**
  - **Many with some roundworms being decomposers, some predators, and some parasites**

### DISCUSSION QUESTION

What are some differences between sponges and roundworms? *mobility, digestion, reproduction, survival*

## Section 3 Mollusks and Segmented Worms

- **Characteristics of mollusks—**invertebrates usually with shells protecting their soft bodies, mantle, and muscular foot
  - **Mantle—**tissue that covers a mollusk's soft body and that may produce a shell
  - **Gills or gill** exchange carbon dioxide from the animal for oxygen in the air or water
  - **Many mollusks use a radula,** a scratchy tongue-like organ, to help them eat
  - **Some mollusks have an open circulatory system,** which washes blood over organs and lacks blood vessels
- **Types of mollusks**
  - **Gastropods—**most have one shell
    - **Live in water or on land**
    - **Move by gliding their large muscular foot along a trail of mucus**

## Content Outline for Teaching (continued)

- **Bivalves**—have two shells
  - large muscles open and close shell halves
  - water animals that filter food
  - use gills to remove food from water
- **Cephalopods**—have no shell
  - have a foot divided into tentacles with suckers
  - move by using a mantle to quickly squeeze water through a funnel-like siphon
  - have a closed circulatory system with blood vessels
- **Segmented Worms**—also called annelids, have repeating segments, a closed circulatory system, and digest food in a complete system with two openings
  - **Earthworms**—have more than 100 body segments
    - use external bristle-like setae and muscles to move
    - eat organic material in soil
    - exchange carbon dioxide and oxygen through mucus-covered skin
  - **Leeches**—have flat bodies with sucking disks at both ends
    - attach to animals and remove blood or food
    - can store enormous amounts of food for months
  - **Marine worms**—use bristles or setae for movement
    - some marine worms are filter feeders
    - some eat plants or rotting material
    - some marine worms are predators or parasites

### DISCUSSION QUESTION

What is the difference between an open and closed circulatory system? *Open has blood oozing around organs; closed contains blood inside vessels.*

## Section 4 Arthropods and Echinoderms

- **Arthropods**—have appendages such as claws, legs, and antennae plus an exoskeleton
  - **Insects**—such as ants have three body regions called the head, the thorax, and the abdomen
    - open circulatory system transports food and waste but spiracles gather oxygen
    - insects change body form in process called metamorphosis



**Content Outline for Teaching (continued)**

- **Arachnids**—such as spiders have two body regions called the cephalothorax and the abdomen plus four pairs of legs
- **Centipedes and millipedes**—long, thin, segmented animals
  - **Centipedes**—predators with one pair of jointed legs per segment
  - **Millipedes**—plant eaters with two pairs of jointed legs per segment
- **Crustaceans**—water animals such as lobsters usually having two pairs of antennae, three types of chewing appendages, and five pairs of legs
- **Echinoderms**—have radial symmetry
  - **Sea urchins**—some are predators, some are filter feeders, some eat rotting material
  - **Echinoderms** have spiny skin covering an internal skeleton of plates
  - **Echinoderms** have a water vascular system to help them move and eat
  - **Some echinoderms** can reproduce through regeneration from parts

**DISCUSSION QUESTION**

How do arthropods differ from echinoderms in symmetry? *Arthropods tend to be bilateral. Echinoderms are radial.*



SECCION 1

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SECCION 3

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## Spanish Resources (continued)

**open circulatory system/sistema circulatorio abierto** un tipo de sistema circulatorio de sangre que carece de vasos sanguíneos y en el cual la sangre baña los órganos. (Cap. 8, Sec. 4, pag. 249)

**closed circulatory system/sistema circulatorio cerrado** tipo de sistema circulatorio sanguíneo en que la sangre es transportada a través de vasos sanguíneos en vez de bañar los órganos. (Cap. 8, Sec. 4, pag. 249)

### SECCIÓN 4

## Artrópodos y equinodermos

### Lo que aprenderás

- Enumerar los rasgos que se usan para clasificar a los artrópodos.
- Explicar cómo se relaciona la estructura del exoesqueleto con su función.
- Identificar las características de los equinodermos.

### Por qué es importante

Los artrópodos y los equinodermos muestran gran diversidad y se encuentran en muchos ambientes diferentes.

### Vocabulario

**artrópodo/artropodo** animal con simetría bilateral, apéndices articulados, un endoesqueleto protector y un cuerpo segmentado. (Cap. 8, Sec. 4, pag. 249)

**apendage/apéndice** estructura como una pata, pinta o antena que crece del cuerpo. (Cap. 8, Sec. 4, pag. 249)

**exoskeleton/exoesqueleto** cubierta corporal protectora y rígida de un artrópodo la cual le da apoyo al cuerpo y disminuye la pérdida de agua. (Cap. 8, Sec. 4, pag. 249)

**metamorphosis/metamorfosis** cambio de forma corporal, puede ser completa (huevo, larva, pupa, adulto) o incompleta (huevo, nina, adulto). (Cap. 8, Sec. 4, pag. 249)



### Observa la metamorfosis completa

Muchos insectos sufren metamorfosis completa durante sus vidas. Sustancias químicas secre-

adas por el cuerpo del animal controlan los cambios y cómo se diferencia la forma del cuerpo en las cuatro etapas de la metamorfosis.

### Preguntas del mundo real

¿Cómo son las etapas de la metamorfosis de lasana de la harina?

### Meta

- Observar la metamorfosis de los gusanos de la harina.
- Comparar la apariencia física de los gusanos de la harina en cada paso de la metamorfosis.

### Materiales

- Jarro de boca ancha o pecera vieja
- Germen de trigo o avena
- Un saco o migajas de galleta mezcladas con harina
- Rebanada de manzana o zanahori
- Toalla de papel
- Tela corriente
- Gusanos de la harina
- Liga

### Medidas de seguridad



**¡CUIDADO!** Ten cuidado al trabajar con animales. Nunca te toques la cara durante un laboratorio. Lavare las manos con cuidado despues de laboratorio.

### Procedimiento

1. Establece un habitat para los gusanos de la harina colocando una capa de 1 cm de germen de trigo o avena en el fondo de un jarro. Agrega una capa de 1 cm de pan seco, migajas de galleta mezcladas con harina. Despues agrega otra capa de germen de trigo o avena.
2. Agrega una rebanada de manzana o zanahori como fuente de humedad. Reemplaza la manzana o zanahoria diariamente.
3. Coloca 20 o 30 gusanos de la harina en el jarro. Agrega un pedazo arrugado de toalla de papel.
4. Cubre el jarro con un trozo de tela corriente. Usa la liga para asegurar la tela al jarro.

### Spanish Resources (continued)

- Observa los gusanos diariamente durante los cuatro semanas. Anota tus observaciones en el Diario de Ciencias.

#### Concluye y aplica

- Dibuja y describe la metamorfosis por la cual los gusanos de la harina se vuelven adultos debajo de Datos y Observaciones.
- Describe algunas de las ventajas de que los insectos juveniles sean diferentes a los adultos.
- Explica dónde puedes encontrar gusanos en la harina que comprabas de la tienda de alimentos en tu casa.

#### Comunica tus datos

- Haz un dibujo que muestre las etapas de la metamorfosis de los gusanos de la harina. Ve al Manual de Destrezas de Ciencias.



### Diseña tu propio lombrices que comen desperdicios

#### Preguntas del mundo real

De qué forma la presencia de lombrices de tierra cambia las condiciones del suelo? ¿Un gusano sabe que las condiciones del suelo afectan el tamaño de las plantas? ¿Está tratando de decidir que factores pueden mejorar el suelo de su jardín? Un amigo sugiere que las lombrices de tierra mejoran la calidad del suelo. ¿Cómo puede averiguar si un gusano tiene algún valor para mejorar las condiciones del suelo?

#### Formula una hipótesis

Con base en tus lecturas y observaciones, formula una hipótesis acerca de cómo las lombrices de tierra pueden mejorar las condiciones del suelo.

#### Meta

- Diseñar un experimento que compare las condiciones del suelo en dos ambientes: uno con lombrices de tierra y otro sin ellas.

- Observar los cambios en las condiciones de la tierra durante dos semanas.

#### Posibles materiales

- Lombrices (Lombradoras Rojas)
- Recipientes de 4 litros con agujeros al costado.
- Suelo.
- Agua y arena.
- Lombrico comprado en una tienda.
- Pellets de desechos de alimentos como cascara de frutas, verduras, papas, arroz, puré de papas, etc.
- Lombrico usado para abono.



- **Objetivo de aprendizaje:** Diseñar un experimento que compare las condiciones del suelo en dos ambientes: uno con lombrices de tierra y otro sin ellas.
- **Objetivo de aprendizaje:** Formular una hipótesis acerca de cómo las lombrices de tierra pueden mejorar las condiciones del suelo.
- **Objetivo de aprendizaje:** Diseñar un experimento que compare las condiciones del suelo en dos ambientes: uno con lombrices de tierra y otro sin ellas.

#### Prueba tu hipótesis

##### Diseña un plan

1. Como grupo, ponte de acuerdo para formular una hipótesis y decidir cómo se va a poner a prueba. Identifica qué resultado apoyar la hipótesis.
2. Enumera los pasos que necesitas tomar para poner a prueba la hipótesis. Se espera que cada paso se enumere los materiales.
3. Prepara una tabla de datos en tu Diario de Ciencias para anotar las observaciones.
4. Lee todo el experimento para asegurarte de que todos los pasos sigan un orden lógico.
5. Identifica todas las constantes, variables y condiciones del experimento.

##### Segue tu plan

1. Asegúrate de que tu maestro o supervisión plan antes de comenzar.
2. Realiza el experimento como se planea.
3. Mientras haces el experimento, anota tus observaciones y completa la tabla en tu Diario de Ciencias.

## Spanish Resources (continued)

### Analiza tus datos

1. Compara los cambios en las dos muestras de suelo.
2. Compara los resultados con los de otros equipos.
3. Identifica el control en este experimento.
4. ¿Cuáles fueron tus variables?

### Concluye y aplica

1. Explica cómo tus resultados apoyaron la hipótesis.
2. Describe el efecto que crees que la lluvia tendría sobre el suelo y las lombrices.

### Comunica tus datos

- Escribe un panfleto informativo sobre cómo usar lombrices para mejorar el suelo del jardín.
- Incluye diagramas y un procedimiento paso a paso.

## Guía de estudio

### Repasa las ideas principales

### Sección 1 ¿Qué es un animal?

- Los animales son organismos multicelulares que deben encontrar y digerir su propio alimento.
- Los invertebrados son animales sin columna vertebral. Los vertebrados tienen columna vertebral.
- La forma en que se ordenan las partes del cuerpo se llama simetría. Los tres tipos de simetría son bilateral, radial y asimétrica.

### Sección 2 Esponjas, cnidarios, gusanos planos y gusanos redondos

- Las esponjas no tienen tejidos.
- Las esponjas adultas son sésiles y obtienen alimento y oxígeno al filtrar agua a través de sus poros.
- Los cuerpos de los cnidarios tienen tejidos y tienen simetría radial. La mayoría tienen tentáculos con células venenosas para capturar alimentos.
- Los gusanos planos y los gusanos redondos tienen simetría bilateral. Tienen miembros parásitos y miembros de vida libre.

### Sección 3 Moluscos y gusanos segmentados

- Los moluscos son animales de cuerpo blando que generalmente tienen concha y sistema circulatorio abierto.
- Los escaropodos bivalvos y calapodos son tipos de moluscos.
- Los anélidos tienen cuerpo segmentado y la cavidad del cuerpo separa los órganos internos de la pared del cuerpo.

### Sección 4 Artrópodos y equinodermos

- Los artrópodos tienen exoesqueleto que cubre, protege y da sostén al cuerpo.
- Los artrópodos se desarrollan por medio de metamorfosis completa o metamorfosis incompleta.
- Los equinodermos son invertebrados de piel espesa y tienen un sistema vascular acuifero.



# Teacher Guide & Answers

## Hands-On Activities

### Initial AB Try at Home (page 1)

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### Initial AB (page 1)

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### AB (page 2)

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### AB (page 3)

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### Lab Activity 1 (page 1)

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#### Materials and Observation

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#### Questions and Conclusion

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### Lab Activity 2 (page 1)

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#### Materials and Observation

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**Teacher Guide & Answers (continued)**

**Understanding the Text**

1. **What is the main idea of the passage?**  
 The main idea of the passage is that the human body has many different parts, each with a specific function. The passage describes the skeletal system, the muscular system, and the circulatory system, and explains how they work together to support the body's structure and movement.

2. **What is the purpose of the passage?**  
 The purpose of the passage is to inform the reader about the different parts of the human body and how they work together to support the body's structure and movement.

3. **What are the main details of the passage?**  
 The main details of the passage are the descriptions of the skeletal system, the muscular system, and the circulatory system, and the explanation of how they work together to support the body's structure and movement.

**Meeting Individual Needs**

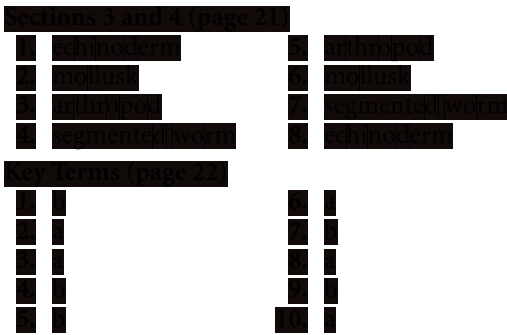
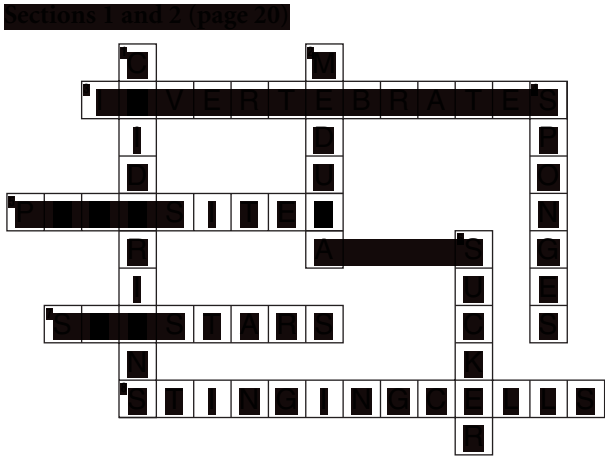
**Content Mastery (page 21)**

1. **What are the three main systems of the human body?**  
 The three main systems of the human body are the skeletal system, the muscular system, and the circulatory system.

2. **What is the function of the skeletal system?**  
 The function of the skeletal system is to support the body's structure and protect the internal organs.

3. **What is the function of the muscular system?**  
 The function of the muscular system is to move the body and support its structure.

4. **What is the function of the circulatory system?**  
 The function of the circulatory system is to transport blood throughout the body, carrying oxygen and nutrients to the cells and removing waste products.

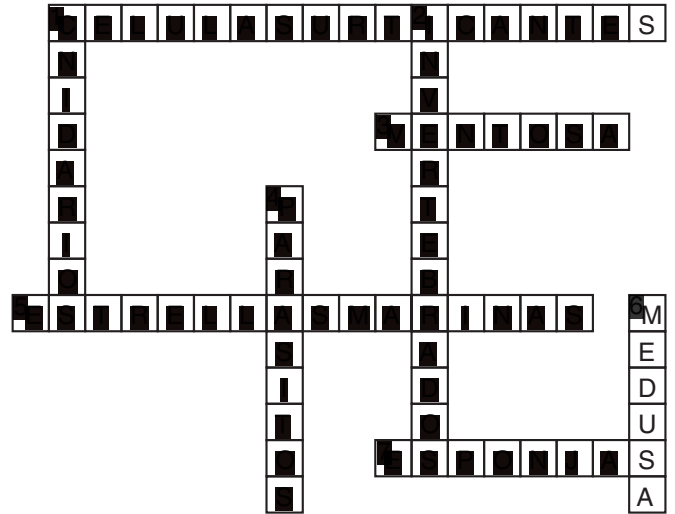


**Understanding the Text (page 22)**

1. **What is the main idea of the passage?**  
 The main idea of the passage is that the human body has many different parts, each with a specific function. The passage describes the skeletal system, the muscular system, and the circulatory system, and explains how they work together to support the body's structure and movement.

2. **What is the purpose of the passage?**  
 The purpose of the passage is to inform the reader about the different parts of the human body and how they work together to support the body's structure and movement.

3. **What are the main details of the passage?**  
 The main details of the passage are the descriptions of the skeletal system, the muscular system, and the circulatory system, and the explanation of how they work together to support the body's structure and movement.



**Content Mastery (page 22)**

1. **What are the three main systems of the human body?**  
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 The function of the muscular system is to move the body and support its structure.

4. **What is the function of the circulatory system?**  
 The function of the circulatory system is to transport blood throughout the body, carrying oxygen and nutrients to the cells and removing waste products.





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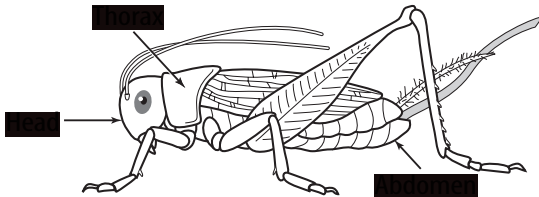
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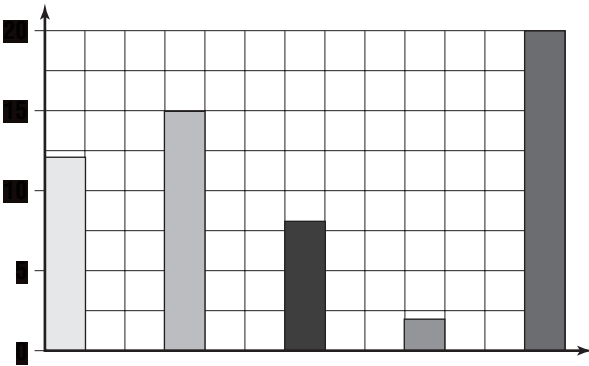
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Teacher Guide & Answers (continued)

Understanding Concepts (page 40)

Understanding Concepts (page 40)



Understanding Concepts (page 40)

Understanding Concepts (page 40)

Understanding Concepts (page 40)

Understanding Concepts (page 40)

Transparency Activities

Section Focus Transparency 1 (page 46)

Section Focus Transparency 1 (page 46)

Section Focus Transparency 1 (page 46)

Section Focus Transparency 1 (page 46)

Section Focus Transparency 2 (page 47)

Section Focus Transparency 2 (page 47)

Section Focus Transparency 2 (page 47)

Teacher Guide & Answers (continued)

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Student Workbooks

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Section Focus Transparency 4 (page 49)

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Answers to Student Workbooks

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Teaching Transparency Page 51

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Teacher Guide & Answers (continued)

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