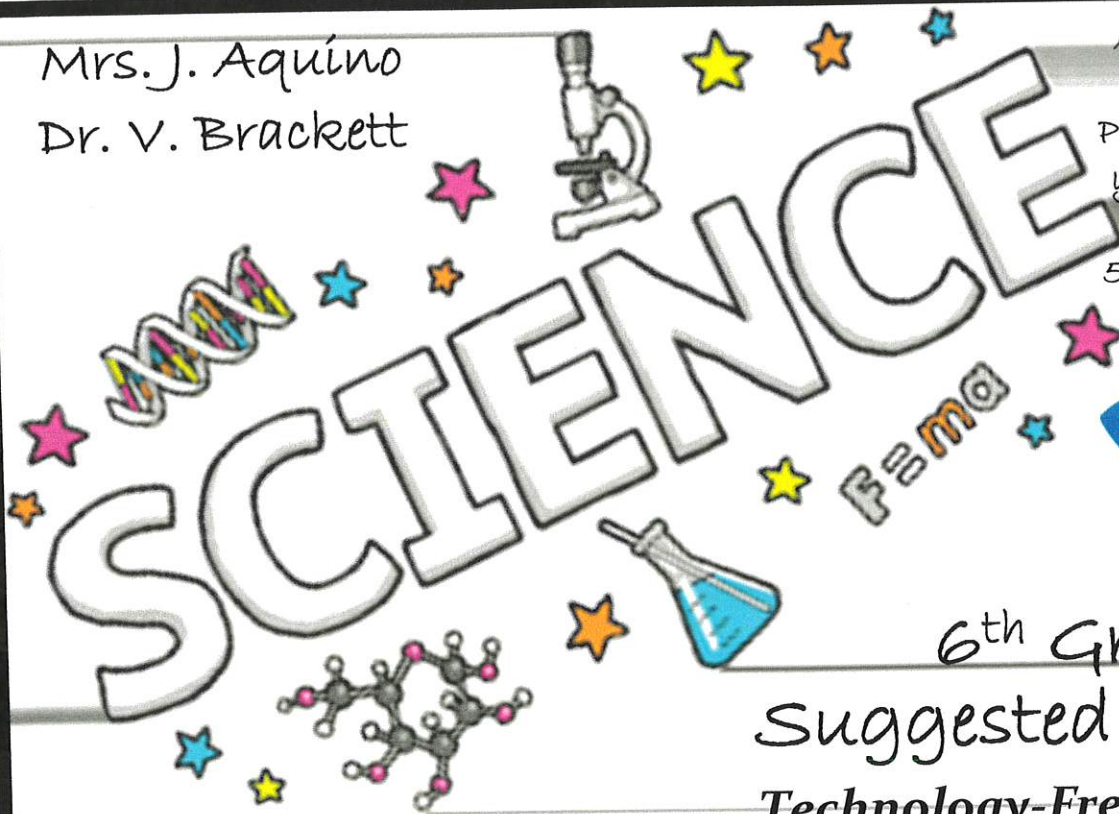


Mrs. J. Aquino  
Dr. V. Brackett



All assignments will  
be GRADED!

Please be sure to submit  
your completed packet  
NO LATER THAN  
5 days upon returning  
to school.



6<sup>th</sup> Grade  
Suggested Timeline  
Technology-Free Alternative

Days	Activity
	Interactive Science Essentials Workbook <i>Read all the items in the margins and complete the activities as directed.</i>
March 16-19 (Days 1-4)	pgs. 281-289
March 23-26 (Days 5-9)	pgs. 290-297
March 30-April 3 (Days 10-12)	pgs. 298-306

Name \_\_\_\_\_

Never  
STOP  
Learning



## Chapter 10

# Animal Diversity

### Grade 6 South Carolina Academic Standards and Performance Indicators for Science

- 6.S.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
- 6.S.1A.4 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.
- 6.S.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.
- 6.S.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.
- 6.L.4A.1 Obtain and communicate information to support claims that living organisms (1) obtain and use resources for energy, (2) respond to stimuli, (3) reproduce, and (4) grow and develop.
- 6.L.4A.2 Develop and use models to classify organisms based on the current hierarchical taxonomic structure (including the kingdoms of protists, plants, fungi, and animals).
- 6.L.4B.1 Analyze and interpret data related to the diversity of animals to support claims that all animals (vertebrates and invertebrates) share common characteristics.
- 6.L.4B.2, 6.L.4B.3, 6.L.4B.5

# Animal Diversity



What are the major groups of animals and how do they differ?

## Before You Read

Before you read the chapter, think about what you know about animal diversity. Record your ideas in the first column. Pair with a partner, and discuss his or her thoughts. Write those thoughts in the second column. Then record what you both would like to share with the class in the third column.

Think	Pair	Share

## Chapter Vocabulary

Lesson 1	Lesson 2	Lesson 3
<b>NEW</b> vertebrate invertebrate radial symmetry bilateral symmetry asymmetry	<b>NEW</b> exoskeleton appendage  <b>ACADEMIC</b> internal	<b>NEW</b> chordate notochord  <b>REVIEW</b> egg

# Lesson 1 What defines an animal?

**Scan** Lesson 1 of the chapter. Bodycopy To eugiam zzrit am quissequat praestrud modolo boreet dio et prae sse quiscipisim aliquam quipiscidunt diam, conse minim.

## Main Idea

### Animal Characteristics

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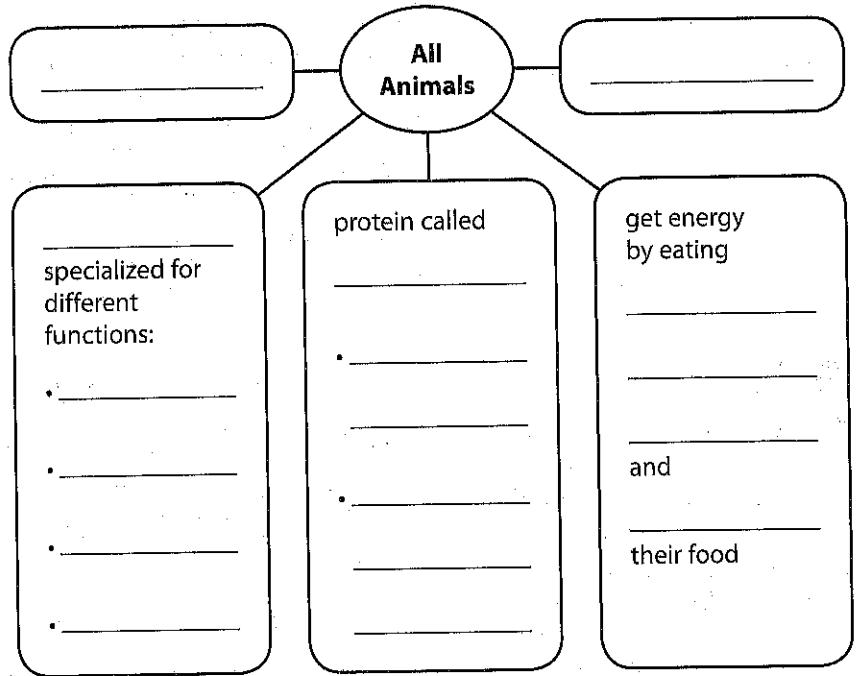
I found this on page \_\_\_\_\_.

### Animal Classification

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## Details

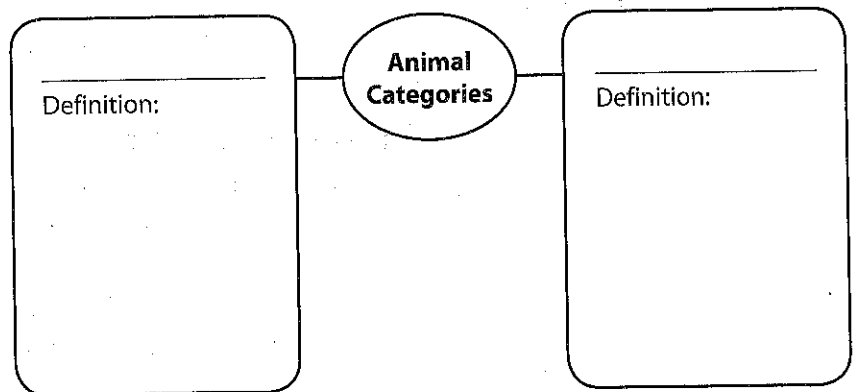
**Organize** information about characteristics of all members of the animal kingdom.



**Identify** two additional characteristics of most animals.



**Distinguish** 2 large categories of animals.



# Animal Diversity

## What defines an animal?

**Key Concepts** 

- What characteristics do all animals have?
- How are animals classified?

**Mark the Text** 

**Ask Questions** As you read, write questions you might have next to each paragraph. Read the lesson a second time and try to answer the questions. When you are done, ask your teacher any questions you still have.



**Key Concept Check**

**1. Identify** What characteristics do all animals have?

..... **Before You Read** .....


<b>What do you think?</b> Read the two statements below and decide whether you agree or disagree with them. Place an A in the Before column if you agree with the statement or a D if you disagree. After you've read this lesson, reread the statements to see if you have changed your mind.		
Before	Statement	After
	1. All animals digest food.	
	2. Corals and jellyfish belong to the same phylum.	

..... **Read to Learn** .....

### Animal Characteristics

Although animals have many traits that make them unique, all members of the Kingdom Animalia have the following characteristics:

- Animals are multicellular and eukaryotic.
- Animal cells are specialized for different functions, such as digestion, reproduction, vision, or taste.
- Animals have a protein, called collagen (KAHL uh juhn), that surrounds the cells and helps them keep their shape.
- Animals get energy for life processes by eating other organisms.
- Animals digest their food.

In addition to the characteristics above, most animals reproduce sexually and are capable of movement at some point in their lives. 

### Animal Classification

Scientists have described and named more than 1.5 million species of animals. Every year thousands more are described and named. Many scientists estimate that Earth is home to millions of animal species that have not yet been discovered. If you discovered a new animal, could you classify it?

## Vertebrates and Invertebrates

You could start classifying an animal by finding out if the animal has a backbone. Animals can be grouped into two large categories: vertebrates (VUR tuh brayts) and invertebrates (ihn VUR tuh brayts). A **vertebrate** is an animal with a backbone. Another name for backbone is spine. Fish, humans, and lizards are examples of vertebrates. An **invertebrate** is an animal that does not have a backbone. Worms, spiders, snails, and insects are examples of invertebrates. Invertebrates make up most of the animal kingdom—about 95 percent. ✓

## Symmetry

Another step you could take to classify an animal is to determine what kind of symmetry it has. Symmetry describes an organism's body plan. Symmetry can help identify the phylum to which an animal belongs.

An animal with **radial symmetry** can be divided into two parts that are nearly mirror images of each other anywhere through its central axis. A radial animal has a top and a bottom but no head or tail. It can be divided along more than one plane and still have two nearly identical halves. Jellyfish, sea stars, and sea anemones have radial symmetry.

An animal with **bilateral symmetry** can be divided into two parts that are nearly mirror images of each other. The two sides of a bilateral animal are mirror images of each other. Birds, mammals, reptiles, worms, and insects have bilateral symmetry.

An animal with **asymmetry** cannot be divided into any two parts that are nearly mirror images of each other. An asymmetrical animal, such as a sponge, does not have a symmetrical body plan. ✓

## Molecular Classification

Molecules such as DNA, RNA, and proteins in an animal's cells also can be used for classification. For example, scientists can compare the DNA from two animals to determine if they are related. The more similar the DNA is, the more closely the animals are related.

Molecular classification has led to discoveries about relationships among species. For example, scientists once classified the grey-faced sengi as a close relative of shrews and voles. Recently, molecular evidence has shown that sengis are more closely related to elephants and armadillos. ✓

### ✓ Reading Check

**2. Differentiate** What is the difference between a vertebrate and an invertebrate?

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### ✓ Reading Check

**3. Describe** What is bilateral symmetry?

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### ✓ Key Concept Check

**4. Recognize** How are animals classified?

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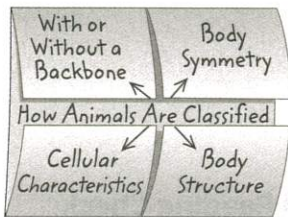
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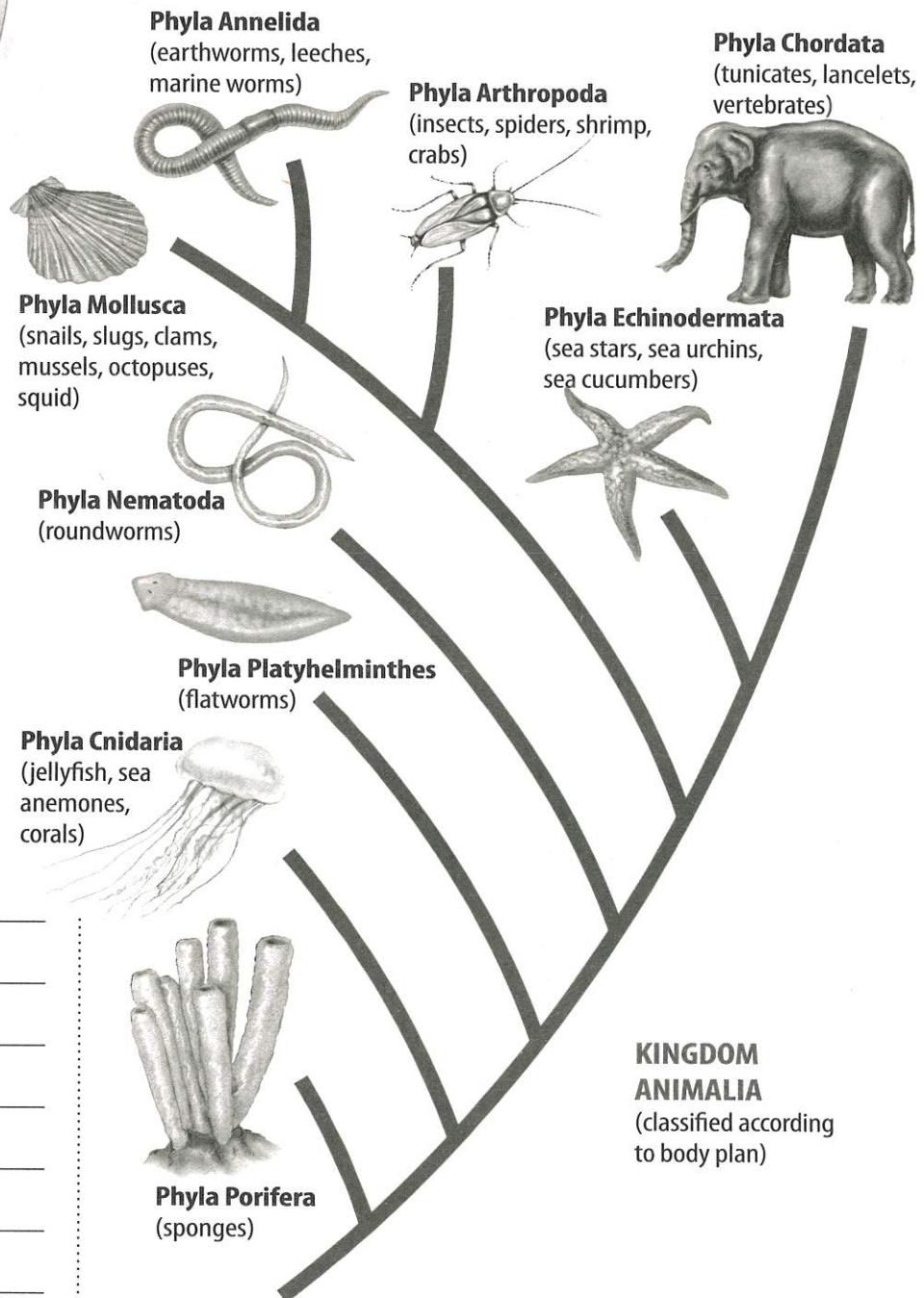
## FOLDABLES®

Make a small horizontal four-door book to record your notes about the classification of animals.



## Major Phyla

Scientists classify the members of the animal kingdom into as many as 35 phyla (singular, phylum). The nine major phyla, shown in the figure below, contain 95–99 percent of all animal species. Animals belonging to the same phylum have similar body structures and other characteristics. Only one animal phylum, Chordata (kor DAH tuh), contains vertebrates. The other major phyla contain only invertebrates.



### Visual Check

**5. State** What are the major phyla of animals?

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# ..... After You Read .....

## Mini Glossary

**asymmetry:** when an animal cannot be divided into any two parts that are nearly mirror images of each other

**bilateral symmetry:** when an animal can be divided into two parts that are nearly mirror images of each other

**invertebrate (ihn VUR tuh brayt):** an animal that does not have a backbone

**radial symmetry:** when an animal can be divided into two parts that are nearly mirror images of each other anywhere through its central axis

**vertebrate (VUR tuh brayt):** an animal with a backbone

1. Review the terms and their definitions in the Mini Glossary. Write a sentence explaining the difference between vertebrates and invertebrates.

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2. In the graphic organizer, identify at least two species of organisms that belong in each phylum shown.

Arthropoda	Mollusca	Chordata
↓	↓	↓

3. What kind of symmetry do you have? Explain your answer.

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### What do you think NOW?

Reread the statements at the beginning of the lesson. Fill in the After column with an A if you agree with the statement or a D if you disagree. Did you change your mind?



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END OF LESSON


Main Idea

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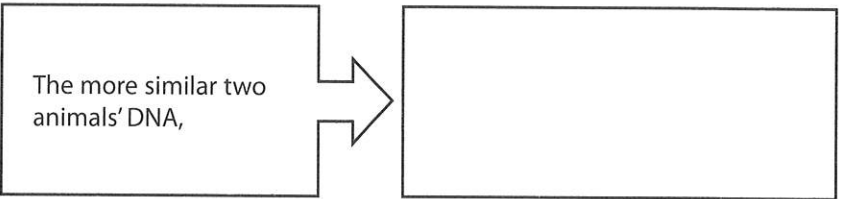
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Details

 **Differentiate** 3 types of symmetry. Write the type, and illustrate it with a simple drawing.


<hr/> <hr/>	<hr/> <hr/>	<hr/> <hr/>
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 **Correlate** molecular similarities to animal relationships.



 **Identify** the 9 major phyla of the animal kingdom. Write an example for each phylum.

Major Phyla of Kingdom Animalia		
Example:	Example:	Example:
Example:	Example:	Example:
Example:	Example:	Example:

 **Connect It** Explain why scientists classify animals.

<hr/> <hr/> <hr/>
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## Lesson 2 Invertebrate Phyla

**Scan** Lesson 2. Read the lesson titles and bold words. Look at the pictures. Identify three facts you discovered about invertebrates. Record your facts in your Science Journal.

### Main Idea

#### Characteristics of Invertebrates

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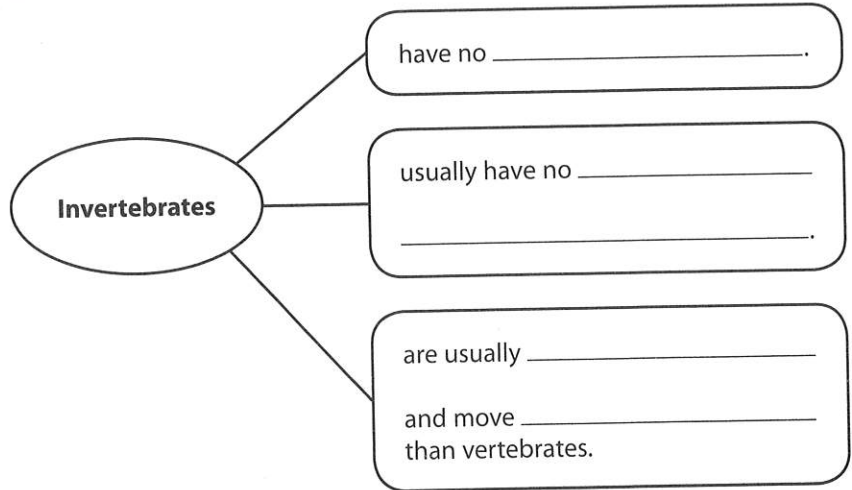
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#### Sponges and Cnidarians

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### Details

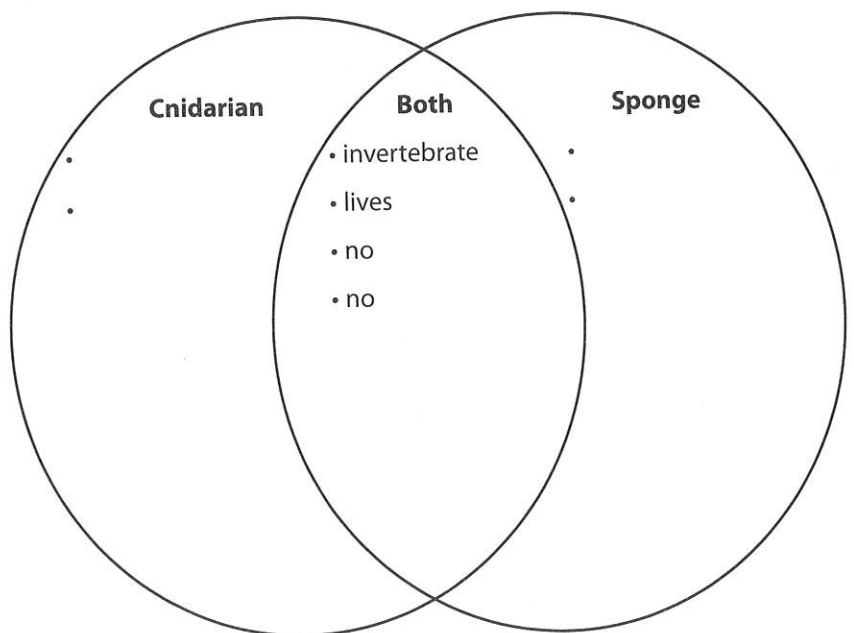
**Characterize** invertebrates.



**Contrast** percentages of vertebrate and invertebrate species.

Percentages of Species	
Invertebrates:	Vertebrates:

**Compare and contrast** sponges and cnidarians.



# Animal Diversity

## Invertebrate Phyla

### Key Concepts

- What are the characteristics of invertebrates?
- How do the invertebrate phyla differ?

### Study Coach

**Make an outline** as you read to summarize the information in the lesson. Use the main headings in the lesson as the main headings in your outline. Use your outline to review the lesson.

### ACADEMIC VOCABULARY

**internal**  
(*adjective*) existing inside something

### Key Concept Check

**1. Identify** What are the characteristics of invertebrates?


### .....Before You Read.....

<b>What do you think?</b> Read the two statements below and decide whether you agree or disagree with them. Place an A in the Before column if you agree with the statement or a D if you disagree. After you've read this lesson, reread the statements to see if you have changed your mind.		
Before	Statement	After
	3. Most animals have backbones.	
	4. All worms belong to the same phylum.	

### .....Read to Learn.....

## Characteristics of Invertebrates

Invertebrates are animals with no backbone. Most invertebrates have no internal structures to help support their bodies. Invertebrates are also usually smaller and move more slowly than vertebrates. More than 95 percent of all animal species that have been recorded are invertebrates.

Invertebrates are a varied group. Their physical characteristics range from the simple structures of sponges and jellyfish to the more complex bodies of worms, snails, and insects. The animals in each invertebrate phylum have similar body plans and physical characteristics. 

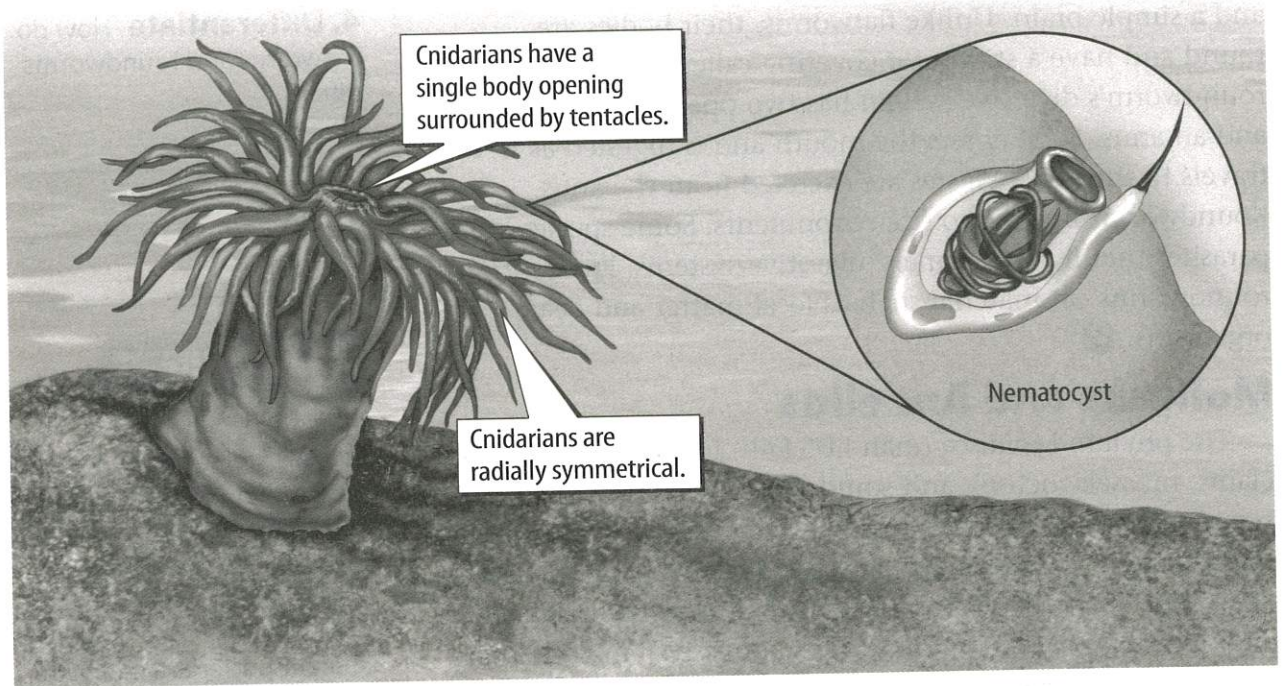
## Sponges and Cnidarians

The simplest invertebrates are the sponges. Sponges belong to the phylum Porifera. All sponges share several characteristics.

Sponges are asymmetrical and have no tissues, organs, or organ systems. Their cells are specialized for capturing food, digestion, and reproduction. Other cells provide support inside the layers of the sponge. All sponges live in water. Most species live in ocean environments.

The phylum Cnidaria (ni DAR ee uh) includes jellyfish, sea anemones, hydras, and corals. Cnidarians, such as the sea anemone, differ from all other animals based on their unique characteristics.

## Cnidarians



Cnidarians, such as the sea anemone in the figure above, have no organs or organ systems. Cnidarians have radial symmetry. They have a single body opening surrounded by tentacles. Simple tissues, including muscles, nerves, and digestive tissue, enable cnidarians to survive by moving, reacting to stimuli, and digesting food.

Cnidarians also have specialized cells called nematocysts (NE mah toh sihsts). They use these cells for defense and capturing food. Most species of cnidarians live in ocean environments. All species live in water. ✓

## Flatworms and Roundworms

Flatworms are invertebrates that belong to the phylum Platyhelminthes (pla tih hel MIHN theeZ). All flatworms share several characteristics.

**Flatworm Characteristics** Flatworms have bilateral symmetry. They have nerve, muscle, and digestive tissues and a simple brain. They have soft and flattened bodies that are usually only a few cells thick. The digestive system of a flatworm has only one opening: a mouth.

Flatworms live in moist environments. Most, like tapeworms, are parasites. They live in or on the bodies of other organisms and rely on them for food. Others are free-living. Many live in oceans or other marine environments.

### ✓ Visual Check

**2. Categorize** What kind of symmetry do cnidarians have?

### ✓ Reading Check

**3. Compare** What characteristics do poriferans and cnidarians share?

**Roundworm Characteristics** Roundworms, also called nematodes, belong to the phylum Nematoda (ne muh TOH duh). Like flatworms, roundworms have bilateral symmetry with nerve, muscle, and digestive tissues and a simple brain. Unlike flatworms, their bodies are round and have a stiff outer covering called a cuticle. A roundworm's digestive system has two openings: a mouth and an anus. Food enters the mouth and is digested as it travels to the anus. Wastes are excreted from the anus. Roundworms live in moist environments. Some species are parasites that live in animals' digestive systems. Free-living roundworms eat material such as fecal matter and dead organisms. ✓

**Mollusks and Annelids**

The phylum Mollusca (mah LUS kuh) includes snails, slugs, clams, mussels, octopi, and squid. Mollusks have bilateral symmetry and soft bodies. Some have hard shells that protect their bodies. Mollusks have digestive systems with two openings. The body cavity contains the heart, the stomach, and other organs. The mollusk circulatory system contains blood but no blood vessels. The nervous system includes eyes and other sensory organs as well as simple brains. Mollusks must live in water or other moist environments.

The phylum Annelida includes earthworms, leeches, and marine worms. Annelida worms have bilateral symmetry and soft bodies. Their bodies consist of repeating segments covered with a thin cuticle. Their digestive systems have two openings. Annelids have circulatory systems that are made up of blood vessels that carry blood throughout the body. Their nervous systems include a simple brain. Annelids live in water or moist environments such as soil.

**Arthropods**

The phylum Arthropoda includes insects, spiders, shrimp, crabs, and their relatives. More species belong to this phylum than all the other animal phyla combined. There are more than 1 million identified species of arthropods.

All arthropods have bilateral symmetry and **exoskeletons**—*thick, hard outer coverings that protect and support animals' bodies*. Arthropods have several pairs of jointed appendages. An **appendage** *is a structure, such as a leg or an arm, that extends from the central part of the body*. The body parts of arthropods are segmented and specialized for different functions such as flying and eating. Arthropods live in almost every environment on Earth. ✓

✓ **Reading Check**

**4. Differentiate** How do flatworms and roundworms differ?

**Math Skills**  $\frac{\times}{+}$

More than 95 percent of animals are invertebrates. This means that 95 out of every 100 animals is some type of invertebrate. Out of every 1,000 animal species, 48 are mollusks. What percentage of animal species are mollusks? Express the information as a fraction.

$$\frac{48}{1,000}$$

Change the fraction to a decimal.

$$\frac{48}{1,000} = 0.048$$

Multiply by 100 and add a % sign.

$$0.048 \times 100 = 4.8\%$$

**5. Use Percentages**

Out of 900,000 species of arthropods, 304,200 are beetles. What percentage of arthropods are beetles?

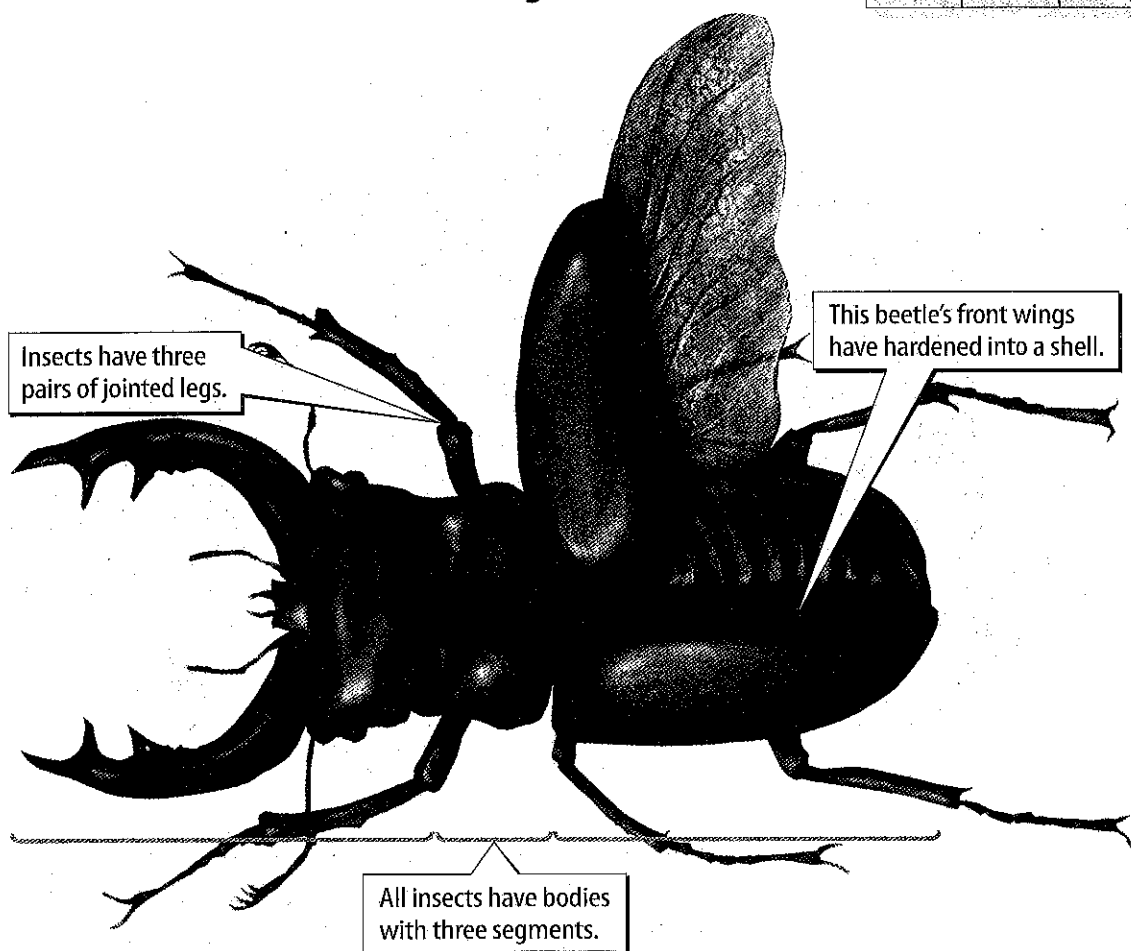
✓ **Reading Check**

**6. Summarize** What do exoskeletons do?

## Insects

The largest order of arthropods is the insects. The stag beetle in the figure below is an insect. All insects have three pairs of jointed legs, three body segments, a pair of antennae, and a pair of compound eyes. Many also have one or two pairs of wings. There are 16 major groups of insects, but most insect species belong to one of five groups. About 40 percent of all known species of insects are beetles.

Stag Beetle



## Arachnids

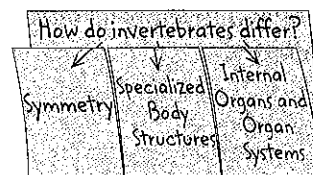
Spiders, ticks, and scorpions are arachnids (uh RAK nudz). All arachnids have four pairs of jointed legs and two body segments. They do not have antennae or wings.

## Crustaceans

All crustaceans (krus TAY shunz) have one or two pairs of antennae. They also have jointed appendages in the mouth area that are specialized for biting and crushing food. Crabs, shrimp, lobsters, and their close relatives are crustaceans.

## FOLDABLES

Make a horizontal three-tab book to identify differences found within the invertebrate phyla.



## Visual Check

**7. Label** two additional characteristics of the stag beetle that are common to all insects.

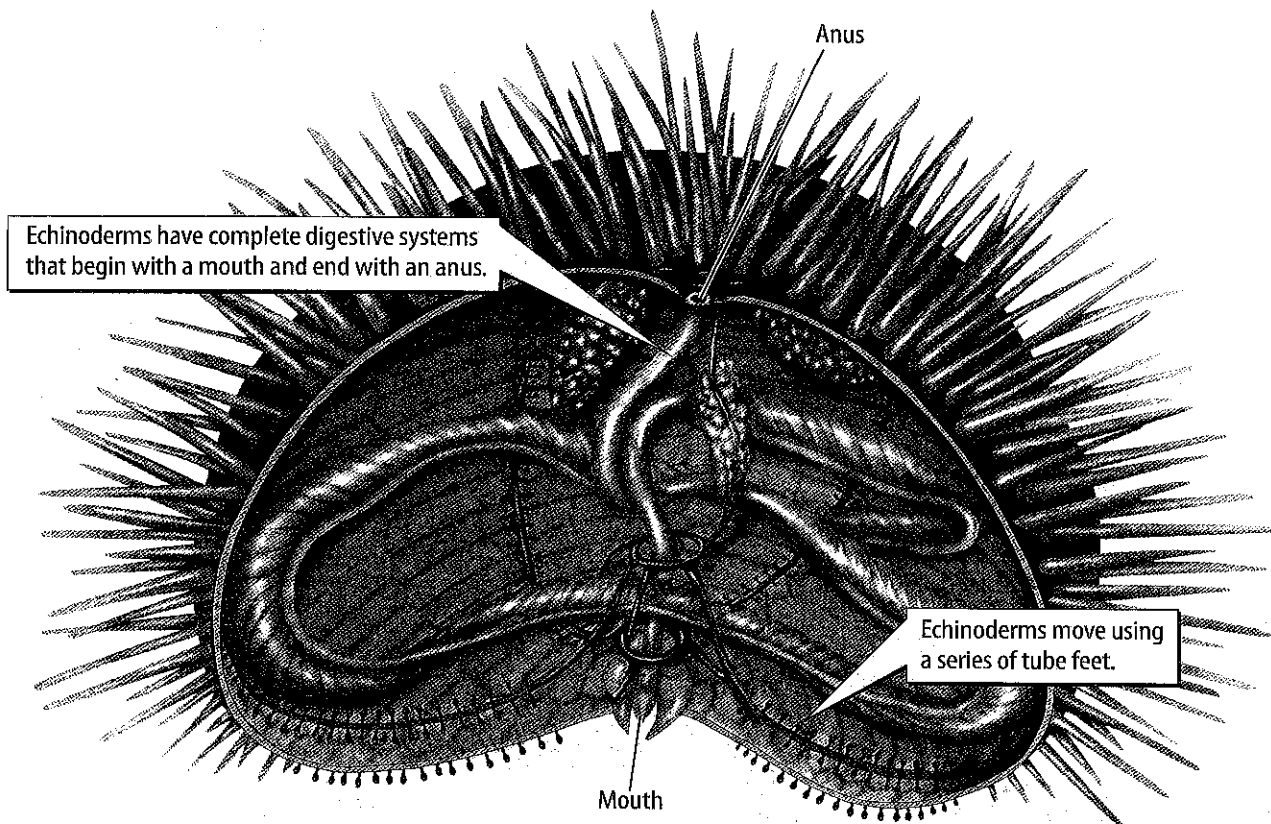
**Visual Check**

**8. Draw** a line through the sea urchin to show its radial symmetry.

## Echinoderms

The phylum Echinodermata (ih kin uh DUR muh tuh) includes sea stars, sea cucumbers, and sea urchins, such as the one in the figure below. Echinoderm (ih KI nuh durm) means “spiny skin.” Echinoderms have some features that are not in any of the other invertebrate phyla. They also are more closely related to vertebrates than to any other phyla.

**Sea Urchin**



**Key Concept Check**

**9. Distinguish** How do the invertebrate phyla differ?

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All echinoderms have radial symmetry. Unlike any other phyla, echinoderms have hard plates embedded in the skin. These plates support the body. Thousands of small, muscular, fluid-filled tubes, called tube feet, enable them to move and feed. They also have complete digestive systems including a mouth and an anus. Echinoderms live only in oceans. However, some can survive out of the water for short periods during low tides.

..... **After You Read** .....

**Mini Glossary**

**appendage:** a structure, such as a leg or an arm, that extends from the central part of the body

**exoskeleton:** a thick, hard outer covering that protects and supports an animal's body

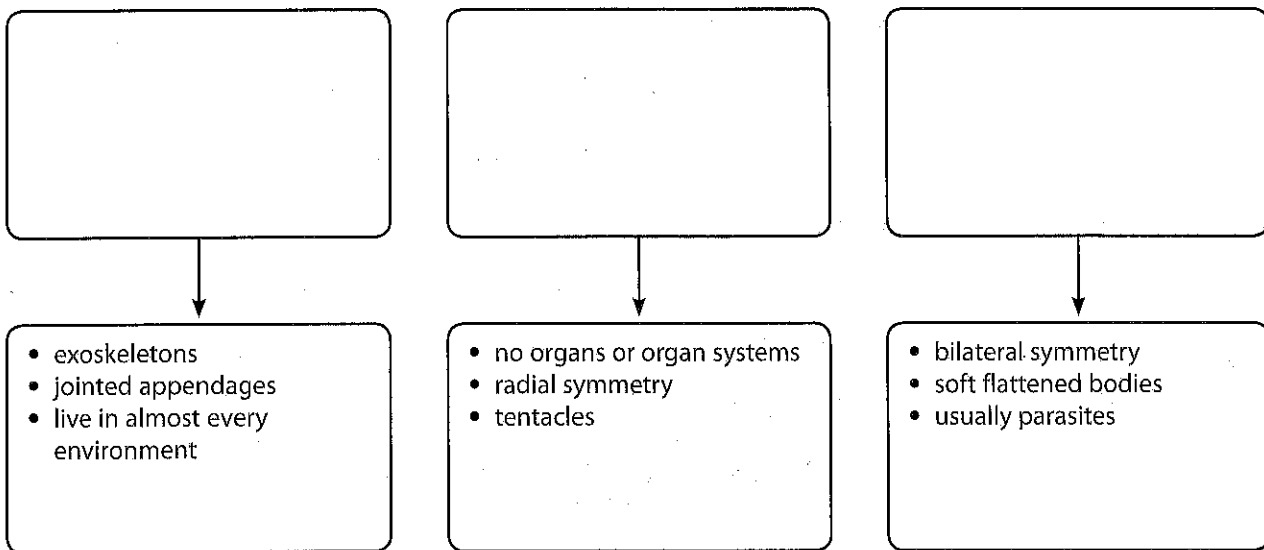
1. Review the terms and their definitions in the Mini Glossary. Write a sentence that identifies at least one organism that has an exoskeleton, and tell what the exoskeleton does.

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2. Complete the graphic organizer below. Read the characteristics given in the bottom row of boxes. Then identify each phylum and write its name in the top row of boxes.



3. Select a word that appears in the main heading of the outline you made. In the space below, write that word and define it.

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**What do you think NOW?**

Reread the statements at the beginning of the lesson. Fill in the After column with an A if you agree with the statement or a D if you disagree. Did you change your mind?



Log on to [ConnectED.mcgraw-hill.com](http://ConnectED.mcgraw-hill.com) and access your textbook to find this lesson's resources.


**END OF LESSON**

Main Idea

Flatworms and Roundworms

I found this on page \_\_\_\_\_.


Details

 **Distinguish** flatworms from roundworms. Circle the characteristics that these two groups have in common.

Characteristic	Flatworms	Roundworms
Phylum		
Symmetry		
Tissue types		
Brain		
Body		
Digestive system openings		
Environment		

Mollusks and Annelids

I found this on page \_\_\_\_\_.

 **Characterize** mollusks and annelids. Circle the characteristics that these two groups have in common.

Characteristic	Mollusks	Annelids
Phylum		
Symmetry		
Body type		
Digestive system openings		
Circulatory system		
Nervous system		
Environment		

Main Idea

Arthropods

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I found this on page \_\_\_\_\_.

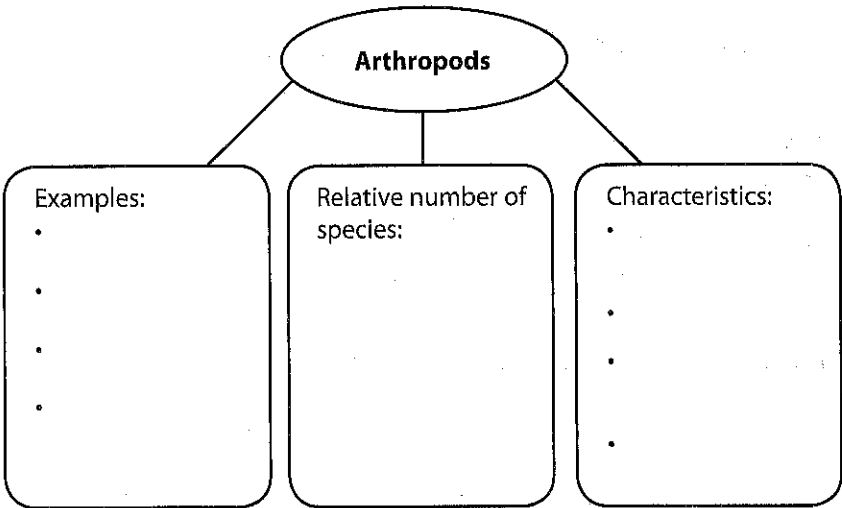
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Echinoderms

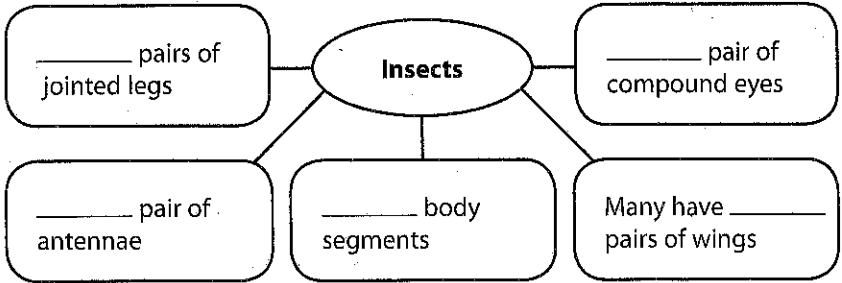
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Details

Describe the phylum Arthropoda.



Examine the common characteristics of all insects.



Distinguish one characteristic that differentiates arachnids from crustaceans.

Characteristic	Arachnids	Crustaceans
Antennae		

Identify a characteristic of echinoderms that does not occur in any other phylum.

\_\_\_\_\_

\_\_\_\_\_

Analyze It What generalization can you make about the order in which the different invertebrate phyla are discussed in Lesson 2?

\_\_\_\_\_

\_\_\_\_\_

# Lesson 3 Phylum Chordata

**Skim** Lesson 3 in your book. Read the headings and look at the photos and illustrations. Identify three things you want to learn more about as you read the lesson. Record your ideas in your Science Journal.

## Main Idea

### Characteristics of Chordates

I found this on page \_\_\_\_\_.

I found this on page \_\_\_\_\_.

### Characteristics of Vertebrates

I found this on page \_\_\_\_\_.

### Fish

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I found this on page \_\_\_\_\_.

I found this on page \_\_\_\_\_.

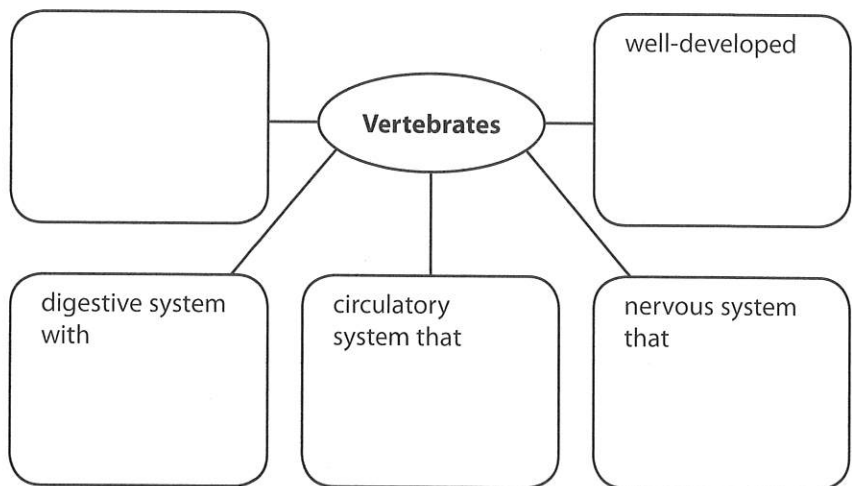
## Details

 **Name** the 4 characteristics shared by all chordates.

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

**Define** notochord.

 **Organize** characteristics of vertebrates.



**Identify** three classes of fish.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

 **Paraphrase** two differences between amphibians and reptiles.

1. \_\_\_\_\_
2. \_\_\_\_\_

# Animal Diversity

## Phylum Chordata

### .....Before You Read.....

<b>What do you think?</b> Read the two statements below and decide whether you agree or disagree with them. Place an A in the Before column if you agree with the statement or a D if you disagree. After you've read this lesson, reread the statements to see if you have changed your mind.		
Before	Statement	After
	5. All chordates have backbones.	
	6. Reptiles have three-chambered hearts.	

### .....Read to Learn.....

#### Characteristics of Chordates

One way to classify an animal is to check for a backbone. Another way to classify animals is to look for the four characteristics of a chordate (KOR dat). A **chordate** *is an animal that has a notochord, a nerve cord, a tail, and structures called pharyngeal (fer IN jee ul) pouches at some point in its life.* In vertebrates, these characteristics exist only during embryonic development. A **notochord** *is a flexible, rod-shaped structure that supports the body of a developing chordate.* The nerve cord develops into the central nervous system. The pharyngeal pouches are between the mouth and the digestive system.

Most chordates are vertebrates. Two groups of invertebrates, tunicates and lancelets (LAN sluhts), are chordates. A lancelet is shown in the figure to the right. Invertebrate chordates live in salt water. They are usually only a few centimeters long. In vertebrate chordates, such as humans, the notochord develops into a backbone during the growth of an embryo.



#### Key Concepts

- What are the characteristics of all chordates?
- What are the characteristics of all vertebrates?
- How do the classes of vertebrates differ?

#### Mark the Text

**Sticky Notes** As you read, use sticky notes to mark information that you do not understand. Read the text carefully a second time. If you still need help, write a list of questions to ask your teacher.

#### Visual Check

- 1. Locate** Highlight the lancelet's notochord.

#### Key Concept Check

- 2. Identify** What are the characteristics of chordates?

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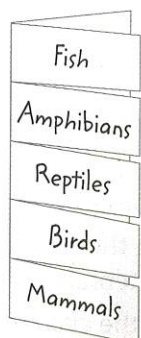
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## FOLDABLES®

Make a vertical five-tab book to identify specific characteristics and examples of vertebrates.



### Key Concept Check

**3. Recognize** What are the characteristics of all vertebrates?

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### Reading Check

**4. Differentiate** How do amphibians differ from fish?

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## Characteristics of Vertebrates

Recall that all vertebrates have a backbone, also called a spinal column or spine. The backbone is a series of structures that surround and protect the nerve cord, or spinal cord. The spinal cord connects all the nerves in the body to the brain. Bones that form a backbone are called vertebrae (VUR tuh bray). If you gently touch the back of your neck, the bones you feel are some of your vertebrae.

Vertebrates have well-developed organ systems. All vertebrates have digestive systems with two openings. They also have circulatory systems that move blood through the body and nervous systems that include brains. The five major groups of vertebrates are fish, amphibians, reptiles, birds, and mammals. 

## Fish


Most fish spend their entire lives in water. All fish share two important characteristics: gills for absorbing oxygen gas from water and paired fins for swimming. Fish are grouped into one of three classes.

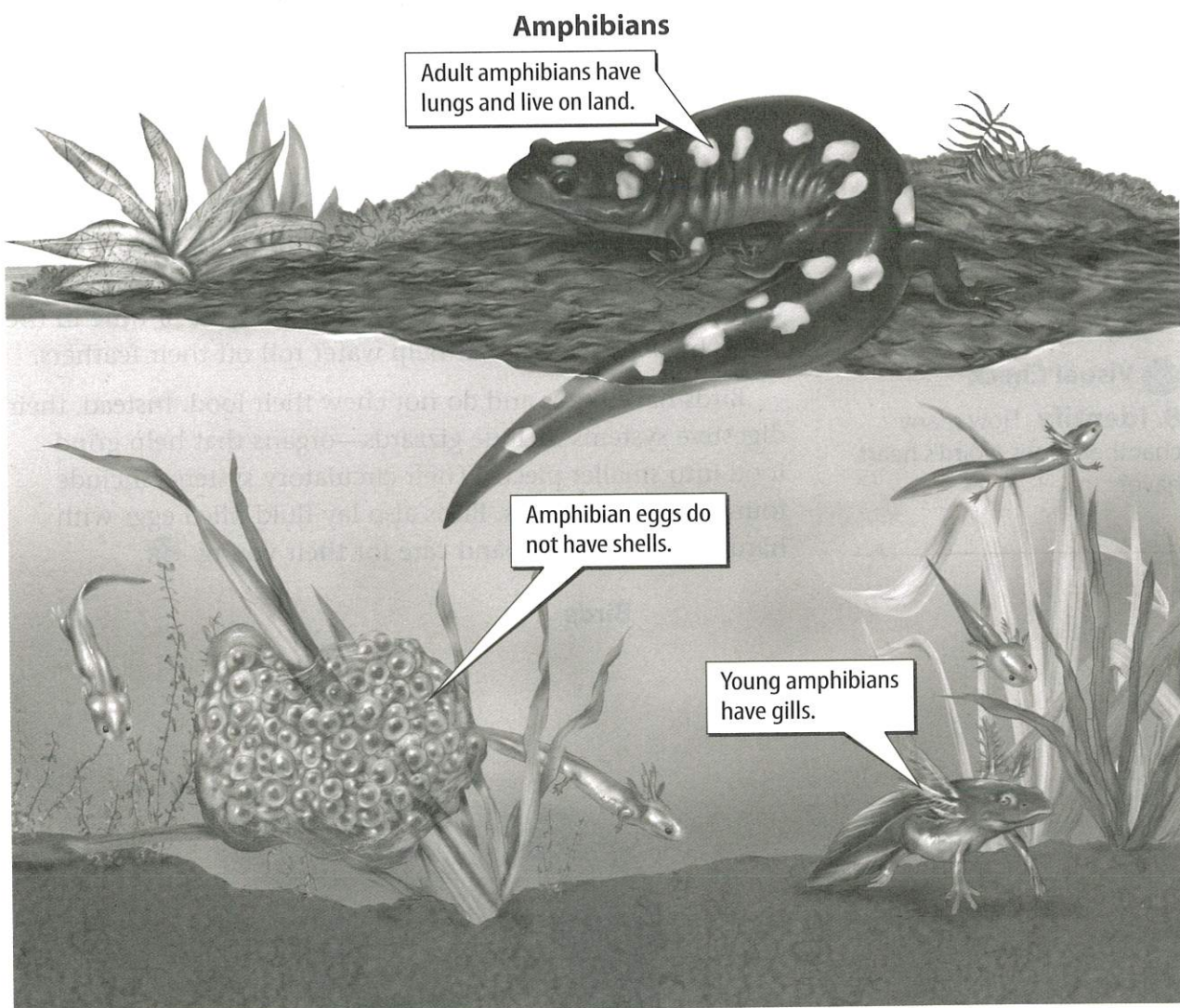
Hagfish and lampreys have no jaws and are in a group called jawless fish. Sharks, skates, and rays are called cartilaginous fish. They have skeletons made of a tough, fibrous tissue called cartilage (KAR tuh lihj). Both jawless and cartilaginous fish have internal structures made of cartilage.

Trout, guppies, perch, tuna, mackerel, and thousands of other species do not have cartilaginous skeletons. Instead, they have bones and are grouped together as bony fish.

## Amphibians

Frogs, toads, and salamanders belong to the class Amphibia. Most amphibians spend part of their lives in water and part on land. Their bodies change as they grow older. In many species, the young have different body forms than the adults do. The different body forms of a salamander are shown in the figure on the next page.

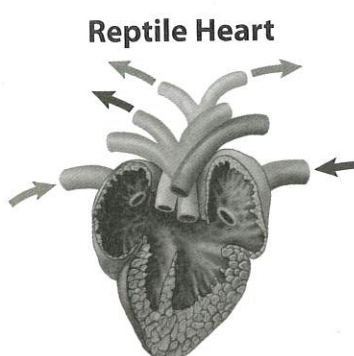
Amphibians have skeletons made of bone. They have legs for movement. Their skin is smooth and moist, and their hearts have three chambers. Amphibians lay eggs. The eggs do not have hard protective coverings, or shells. Their eggs must be laid in moist environments such as ponds. The young live in water and have gills. Most adults develop lungs and live on land. 



## Reptiles

Lizards, snakes, turtles, crocodiles, geckos, and alligators belong to the class Reptilia. All reptiles share several characteristics. The skin of reptiles is waterproof and covered in scales. Like amphibians, most reptiles have three-chambered hearts, as shown in the figure at right. Unlike amphibians, lizards and other reptiles have lungs throughout their lives, not just in adulthood.

Most reptiles lay fluid-filled eggs with leathery shells. Unlike amphibian eggs, reptile eggs are laid on land rather than in water. Young reptiles do not change form as they mature into adult reptiles.



### Visual Check

**5. Explain** How does the body form of this salamander change as it grows?

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### Visual Check

**6. Distinguish** How are reptile and amphibian hearts similar?

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## ✓ Reading Check

**7. Contrast** How do birds differ from reptiles?

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## ✓ Visual Check

**8. Identify** How many chambers does a bird's heart have?

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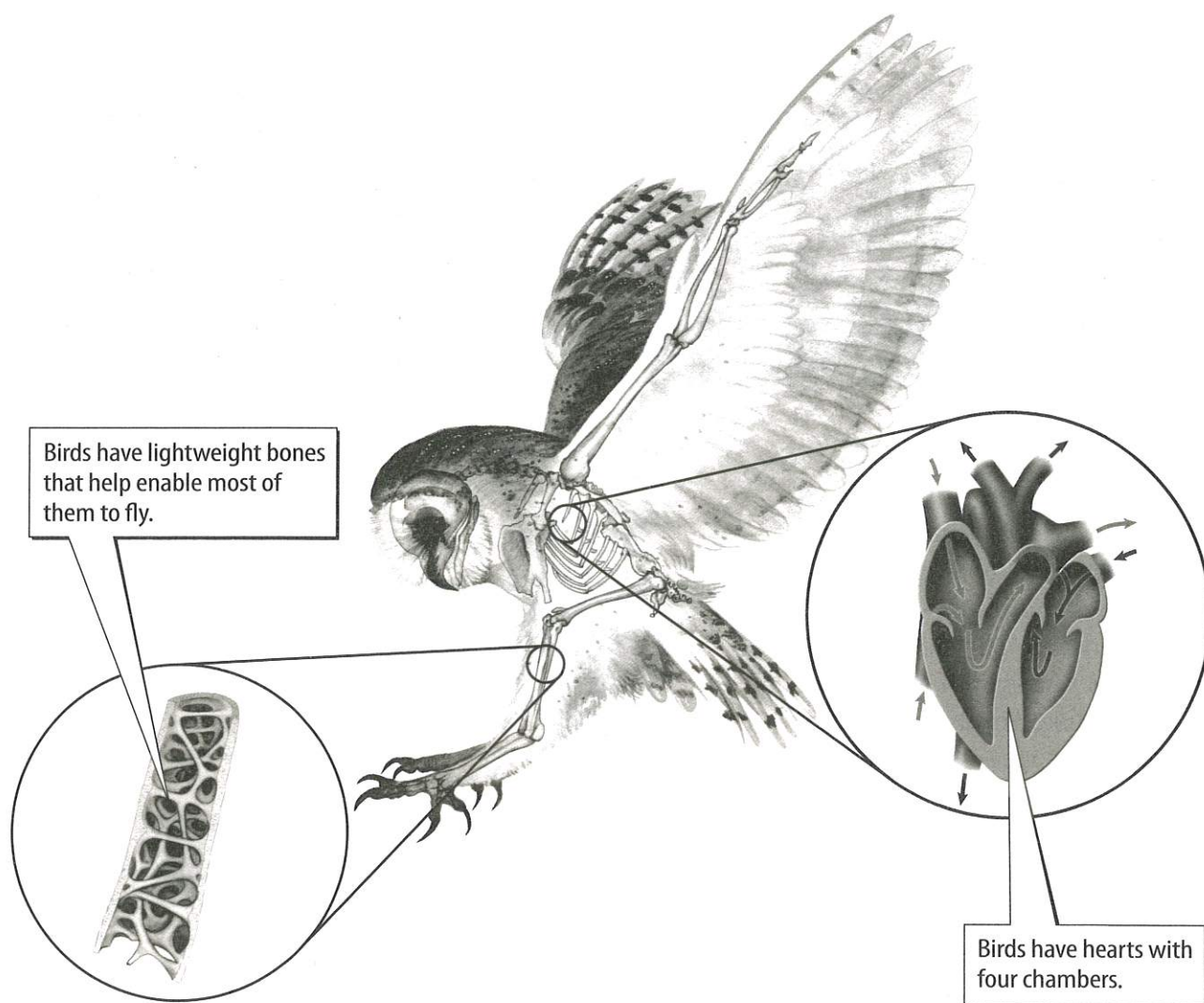
## Birds

All birds, including the owl in the figure below, are in the class Aves. Many birds make nests to hold their eggs, and many have unique calls or songs.

Birds have lightweight bones. Their skin is covered with feathers and scales. Birds also have two legs and two wings. Many birds can fly. They have stiff feathers that enable them to move through the air. Birds that spend a lot of time in the water have oil glands that help water roll off their feathers.

Birds have beaks and do not chew their food. Instead, their digestive systems include gizzards—organs that help grind food into smaller pieces. Their circulatory systems include four-chambered hearts. Birds also lay fluid-filled eggs with hard shells. Birds feed and care for their young. ✓


### Birds



# Mammals

Dogs, cats, goats, rats, seals, whales, and humans are among the many vertebrates belonging to the class Mammalia. All mammals have hair or fur covering their bodies. Mammals have teeth to tear and chew their food.

Mammals have complete digestive systems that include a mouth and an anus. Mammals also have a complex nervous system that includes a brain.

The most notable characteristic of mammals, however, is the presence of mammary glands. These glands produce milk that feeds young mammals. Many mammals give birth to live young. A few species of mammals, including the duck-billed platypus, lay eggs. 


 **Think it Over**

**9. Consider** How might fur benefit mammals?

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 **Key Concept Check**

**10. Classify** How do the classes of vertebrates differ?

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..... **After You Read** .....

**Mini Glossary**

**chordate (KOR dat):** an animal that has a notochord, a nerve cord, a tail, and pharyngeal pouches at some point in its life

**notochord:** a flexible, rod-shaped structure that supports the body of a developing chordate

1. Review the terms and their definitions in the Mini Glossary. Write a sentence that describes the two groups of chordate invertebrates.


2. Complete the chart. Provide three characteristics and three examples for each vertebrate group.

Vertebrates	Class Name	Characteristics	Examples of Animals
amphibians			
reptiles			
birds			

**What do you think**

**NOW?**

Reread the statements at the beginning of the lesson. Fill in the After column with an A if you agree with the statement or a D if you disagree. Did you change your mind?



Log on to [ConnectED.mcgraw-hill.com](http://ConnectED.mcgraw-hill.com) and access your textbook to find this lesson's resources.



Main Idea

Details

**Amphibians**  
 I found this on page \_\_\_\_\_

Arrange details about amphibians.

Characteristic	Details
Class	
Young	<ul style="list-style-type: none"> <li>live</li> <li>get oxygen with</li> </ul>
Adult	<ul style="list-style-type: none"> <li>most live</li> <li>most breathe with</li> </ul>
Eggs	<ul style="list-style-type: none"> <li>do not have</li> <li>where laid:</li> </ul>
Skeleton	<ul style="list-style-type: none"> <li>made of</li> <li>includes</li> </ul>
Heart	<ul style="list-style-type: none"> <li></li> </ul>
Skin	<ul style="list-style-type: none"> <li></li> <li></li> </ul>
Examples	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> </ul>

**Reptiles**  
 I found this on page \_\_\_\_\_

Identify characteristics of reptiles.

Characteristic	Details
Class	
Stages that have lungs	<ul style="list-style-type: none"> <li></li> <li></li> </ul>
Eggs	<ul style="list-style-type: none"> <li>covering:</li> <li>where laid:</li> </ul>
Skin	<ul style="list-style-type: none"> <li></li> <li></li> </ul>
Heart	<ul style="list-style-type: none"> <li></li> </ul>
Examples	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> <li></li> </ul>

Main Idea

Birds

I found this on page \_\_\_\_\_.

Mammals

I found this on page \_\_\_\_\_.

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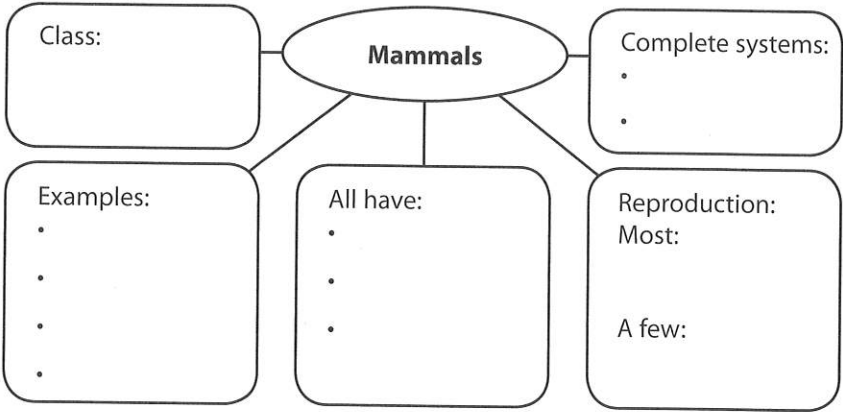
I found this on page \_\_\_\_\_.

Details

Characterize *birds*.

Characteristic	Details
Class	
Bones	•
Eggs	• covering: • where often laid:
Skin	• •
Heart	•
Description of eating and digestion	

Organize characteristics of mammals.



Identify two ways that mammals differ from birds.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_

Connect It Aside from backbones, what other characteristics do vertebrates generally share? How do their systems compare, as a group, with invertebrates?

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\_\_\_\_\_

## Review Animal Diversity

## Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned.

**Use this checklist to help you study.**

- ☐ Complete your Foldables® Chapter Project.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Reread the chapter, and review the charts, graphs, and illustrations.
- ☐ Review the Understanding Key Concepts at the end of each lesson.
- ☐ Look over the Chapter Review at the end of the chapter.



**Summarize It** Reread the chapter Big Idea and the lesson Key Concepts. Summarize why the chapter is titled *Animal Diversity*. Tell how the title of each lesson is related to its contents.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.

**Challenge** Human beings are mammals. Make a poster that shows the characteristics of the human body plan and the body plan of another mammal. Highlight the characteristics that are the same for the two. Display your poster in your class.



# Animal Structure and Function

## Grade 6 South Carolina Academic Standards and Performance Indicators for Science

- 6.S.1A.2 Develop, use, and refine models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
- 6.S.1A.4 Ask questions to (1) generate hypotheses for scientific investigations, (2) refine models, explanations, or designs, or (3) extend the results of investigations or challenge claims.
- 6.S.1A.5 Use mathematical and computational thinking to (1) use and manipulate appropriate metric units, (2) collect and analyze data, (3) express relationships between variables for models and investigations, or (4) use grade-level appropriate statistics to analyze data.
- 6.S.1A.6 Construct explanations of phenomena using (1) primary or secondary scientific evidence and models, (2) conclusions from scientific investigations, (3) predictions based on observations and measurements, or (4) data communicated in graphs, tables, or diagrams.
- 6.S.1A.8 Obtain and evaluate scientific information to (1) answer questions, (2) explain or describe phenomena, (3) develop models, (4) evaluate hypotheses, explanations, claims, or designs or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate primary or secondary scientific literature, or (2) reporting the results of student experimental investigations.

6.L.4B.1, 6.L.4B.2