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Unit 9 Resources

The Human Body

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ISBN 13: 978-0-07-874613-0
ISBN 10: 0-07-874613-2

Printed in the United States of America

1 2 3 4 5 6 7 8 9 10 045 11 10 09 08 07 06

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Date of Approval

Student Lab Safety Form

Student Name: _____

Date: _____

Lab Title: _____

In order to show your teacher that you understand the safety concerns of this lab, the following questions must be answered after the teacher explains the information to you. You must have your teacher initial this form before you can proceed with the lab.

1. How would you describe what you will be doing during this lab?

2. What are the safety concerns associated with this lab (as explained by your teacher)?

- _____
- _____
- _____
- _____
- _____

3. What additional safety concerns or questions do you have?

Adapted from Gerlovich, et al. (2004). The Total Science Safety System CD, JaKel, Inc.
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Table of Contents

Reproducible Pages

Chapter 32 Integumentary, Skeletal, and Muscular Systems

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 32
Integumentary, Skeletal, and Muscular Systems

Before reading Chapter 32, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Rebecca and several friends are at the beach for the day. By the end of the day, the girls' skin has begun to tan, and questions about tanning leads Rebecca's friend to ask about the purpose of skin. Rebecca's father is a dermatologist, and she asks him about the different functions of skin. What is one answer Rebecca's father gives?

A. Heat absorbed by the skin warms the body core.
B. One skin layer makes vitamin D for the body.
C. Skin stores vital minerals needed by the body.
D. The layers of the skin prevent feelings of pain.

Explain.

_____

_____

_____

2. Kalil is assembling a model of a human skeleton for his coach's lecture about common sports injuries. Which bone placement will Kalil make?

A. The clavicle connects two major leg bones.
B. The patella is between the skull and vertebrae.
C. The radius and ulna are bones in the shoulder.
D. The upper ribs are connected to the sternum.

Explain.

_____

_____

_____

3. While watching a track and field meet, Toki notices the physical differences between the athletes participating in different events. She observes the bursts of speed displayed by the sprinters, the endurance of the long-distance runners, and the large muscle mass of the shot-put throwers. Toki believes there is a genetic basis for these differences. Critique Toki's statement.

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 32

How is a chicken's wing like your arm?

Chickens have structures similar to ours. You will examine a chicken wing and begin to explore it.

Procedure

1. Read and complete the lab safety form.
2. Obtain a **treated chicken wing** in a **self-sealing sandwich bag.** Observe the skin of the wing.
3. Without removing the wing from the bag, manipulate the wing to determine how it moves and where the joints are located.
4. Lay the bag on a flat surface and gently press and massage the wing to determine where bones and muscles are located.
5. Based on your observations, draw the wing as you imagine it might look if the skin was removed. Show the bones and muscles.

Data and Observations

Analysis

1. **Label** your drawing to show which parts correspond to your upper arm, elbow, wrist, and hand.
2. **Differentiate** How are the parts that make up your arm different from the chicken wing?

_____

_____

_____

Name _____ Date _____ Class _____

MiniLab

CHAPTER 32

Examine Skin

How is chicken skin similar to human skin? The skin of chicken has characteristics similar to human skin. Using the chicken wing from the Launch Lab, you will further examine the characteristics of skin.

Procedure

1. Read and complete the lab safety form.
2. Wear disposable **lab gloves.** Remove the **chicken wing** from the **self-sealing bag** and place it in a **dissection pan.**
3. Use a **dissection kit** to remove the skin from the wing. Use **dissection scissors** to carefully snip a hole in the skin that is loosely attached to the wing.
4. Make a cut about 6 cm in length. Pull the skin away from the wing. Use scissors and the **scalpel** to cut through the transparent membrane that attaches the skin to the muscles.
5. Try to remove the skin without making any more holes. Look for pockets of fat, blood vessels, and muscle fibers attached to the skin. Note the strength of the skin.
6. Dispose of the skin and used gloves as directed by your teacher. Clean your dissection tools and dissection pan with **warm, soapy water.** Save the skinned wing for use in the next MiniLab.

Analysis

1. **Think Critically** Human skin contains hair follicles. What type of follicles might you find on chicken skin?

_____

2. **Explain** Why is it important for skin to be strong and elastic?

_____

_____

Name _____ Date _____ Class _____

MiniLab

CHAPTER 32

Examine Bone Attachments

How are bones attached to muscles and other bones? Tendons attach muscle to bone, and ligaments attach bone to bone. You will examine these attachments using the skinned chicken wing from **MiniLab** *Examine Skin*.

Procedure

1. Read and complete the lab safety form.
2. Wear disposable **lab gloves.** Put the **skinned chicken wing** in a **dissection pan.**
3. Choose one muscle and use a pair of **dissection scissors** to cut the muscle away from the bone, leaving each end intact. Look for the long, white, tough tendons that connect the muscle to the bone.
4. Move the bones at the joint and notice how the tendon moves as the bones are pulled.
5. Carefully cut away all the muscles from the bones. The bones will still be attached to each other. Look for the white ligaments that hold them together. Examine the ends of each bone.
6. Draw a diagram of the wing without the muscles showing how the bones are attached to each other. Compare this drawing to the one you made in the Launch Lab.

Data and Observations

Analysis

1. **Compare and Contrast** How is the drawing you made in the Launch Lab different from the drawing you made of the wing in this lab?

_____

_____

2. **Observe and Infer** Did you notice how a muscle is attached at one end to a bone and the ligament at the other end runs across a joint to attach that end of the muscle to the next bone? Explain why this is important. A diagram probably will help your explanation.

_____

3. **Think Critically** At movable joints, what is the color of the ends of the bones? What do you think this material is?

_____

Name _____ Date _____ Class _____

BioLab

CHAPTER 32

Forensics: How can skeletons help you solve a "crime"?

Background: Imagine there is a National Museum of Domestic Chickens and it has been robbed. Several bones from the first chicken eaten in America are missing. Three dogs are suspects. Your job is to examine impressions of bones that were found in mud near the doghouse of each dog and to determine if any of the bones came from a chicken. You will be given a clue for each unknown bone.

Question: *Can the structure and form of a bone tell you from which animal it came?*

Materials

impressions of three unknown bones
set of clues
various animal skeletons
magnifying lens
metric ruler
string

Safety Precautions

Procedure

1. Read and complete the lab safety form.
2. Collect materials you will use to measure and examine the skeletons on display, and determine what type of measurements you will make.
3. Obtain impressions of three bones and a set of clues from your teacher. Do not open the clues until you are told to do so.
4. Design a data table to record your measurements.
5. Examine the skeletons. Compare them to the impressions.
6. Make measurements and record the data.
7. Open the clues you were given and reexamine your data and answers.
8. **Cleanup and Disposal** Return any reusable materials to their proper storage areas.

Data and Observations

Analyze and Conclude

1. **Analyze Data** Based on your observations and measurements, determine which one of the impressions came from a chicken.

2. **Interpret Data** How did you use information concerning the size and shape of each impression to help you determine from which animal it came?

3. **Evaluate** Did your conclusions change after you opened the clue? Explain your reasoning if your conclusions changed.

4. **Compare and Contrast** What similarities did you notice between each impression and bones in the human skeleton? What differences did you notice?

5. **Relate** Which skeletons seem to share the most characteristics with a human skeleton?

6. **Draw Conclusions** Which dog stole the chicken bones?

Name _____ Date _____ Class _____

Real-World Biology: Analysis

CHAPTER 32 Biomechanics

Bethany Hamilton is a courageous teenage girl who is a competitive surfer. When she was 13 years old, Bethany lost her left arm in a shark attack near her home in Hawaii. Three weeks later, she was back in the water and then returned to competitive surfing and other sports with her one good arm. A myoelectric arm was developed for Bethany. Prosthetic devices, such as a myoelectric arm, are possible because, on a mechanical level, the skeleton is a system of bony levers. In the body, the levers of bone are activated by muscles that produce movement. These principles of biomechanics are applied to the design of prosthetic arms and legs.

Levers form one of the most important groups of simple machines. At its simplest, a lever is a rigid bar that can turn freely around a fixed point, known as a fulcrum. **Figure 1** illustrates the three different classes of levers. *L* is the load that is lifted, and *E* is the effort force used to lift the load.

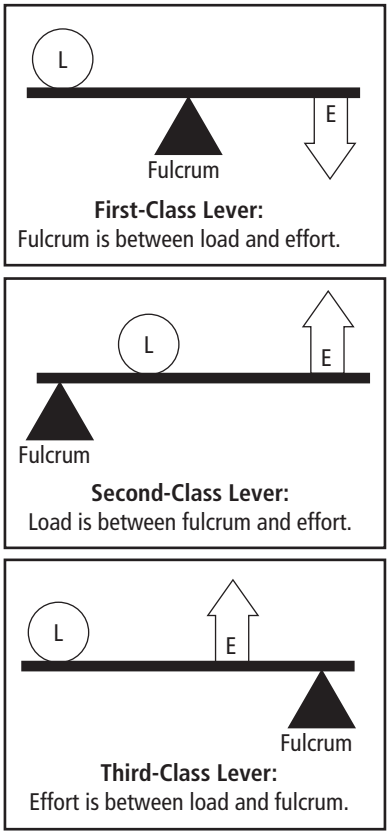


Figure 1

Analyze and Conclude

Respond to each question and statement.

1. **Identify** Adenosine triphosphate (ATP) provides energy to move bones in the human hand. What is the source of the energy needed to move bones in the myoelectric hand?

_____

2. **Apply** For each bone/muscle system in **Figure 2,** indicate which class of lever is illustrated and label the fulcrum, effort force, and load.

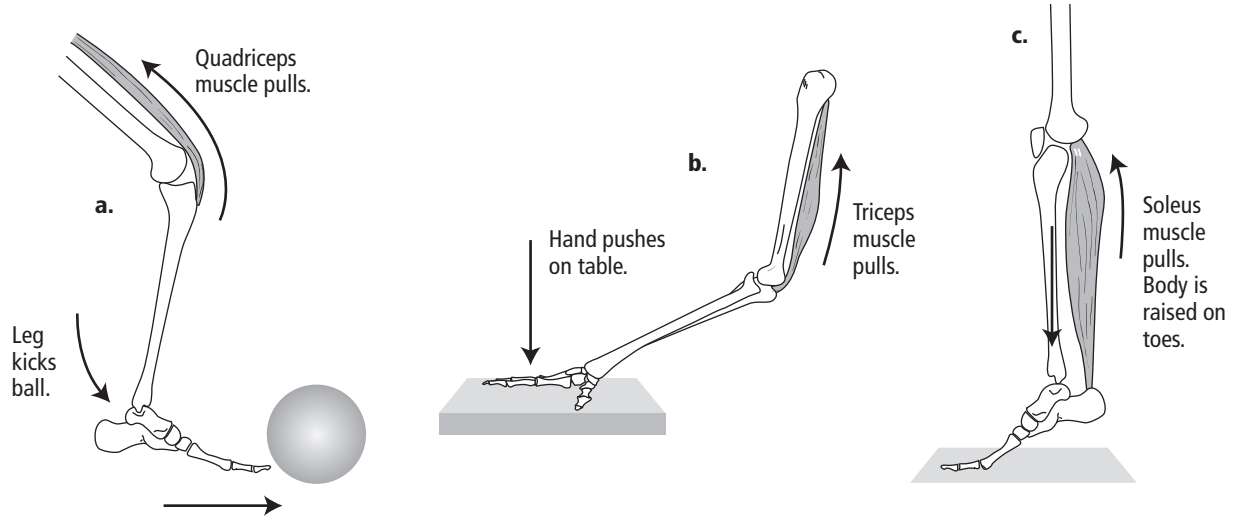


Figure 2

Class of lever **a.** _____ **b.** _____ **c.** _____

3. Apply Label the load and the fulcrum in **Figure 3a** and in **Figure 3b.**

Human Arm

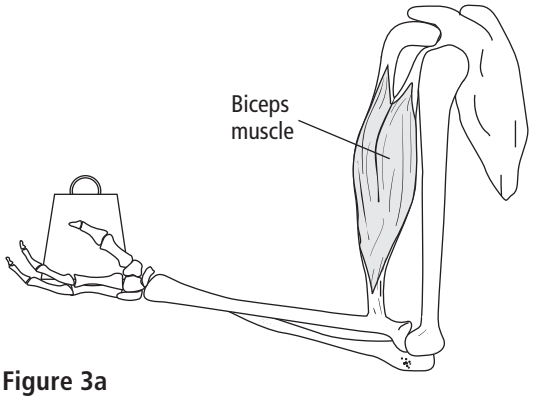


Figure 3a

Myoelectric Arm

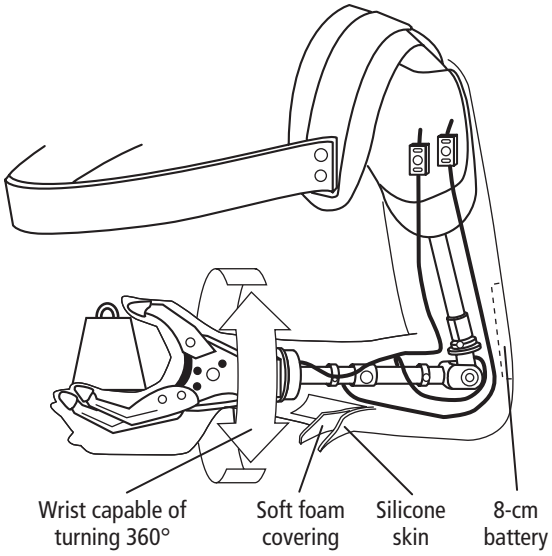


Figure 3b

4. Compare In grasping the load, how does the movement of the human hand compare with that of the myoelectric hand?

CAREERS IN BIOLOGY

Prosthetics Technology Visit biologygmh.com for information on prosthetics technicians. What are the responsibilities of a prosthetics technician?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 32
Group Project: Analyzing Bones

Anthropologists and forensic pathologists try to solve mysteries. An anthropologist might work to solve a mystery that occurred a million years ago. A forensic pathologist might work to solve a recent crime. Both types of scientists work with bones to reconstruct skeletons and provide information about that individual.

Anthropologists often have only fragments of teeth and fossil bone to use to reconstruct the morphology and living habits of ancient humans. Skeletal remains might be all that a forensic pathologist has to use to solve a ten-year-old crime. Certain bones can provide critical information about specific characteristics of an individual.

Select Working in a small group, select one of the forensic or anthropological problems listed in the table to research. For example, one group might research how bones are used to determine the age of an individual, while another group researches the use of bones in determining an individual's sex.

Research After selecting a problem, use your textbook and other reference materials to find information. Include information about the types of bones that scientists use to determine a particular characteristic of an individual and how scientists analyze those bones to make the determination.

Present Finally, present the information that you researched to your class. As other groups give their presentations, fill out the table below. In the space below the table, write questions you have about the information presented. After all the groups have given their presentations, have a class discussion to answer everyone's questions.

Forensic/Anthropological Problem	Bones Used to Solve the Problem
Age of individual	
Height of individual	
Sex of individual	
Diet of individual	
Ancestry of individual	

Name _____ Date _____ Class _____

Concept Mapping

CHAPTER 32

Muscle Contraction

Complete the events chain about muscle contraction. These terms may be used more than once: actin, calcium, contracts, myofibrils, myosin, nerve impulse, relaxes, sarcomere.

1. A(n) _____ travels to the muscle.

↓

2. _____ is released into the _____ .

↓

3. Calcium causes _____ and actin to attach to each other.

↓

4. _____ filaments are pulled to the center of the _____ .

↓

5. The muscle _____ .

↓

6. The filaments slide back into their original positions, and the muscle _____ .

Name _____ Date _____ Class _____

Study Guide

CHAPTER 32
Section 1: The Integumentary System

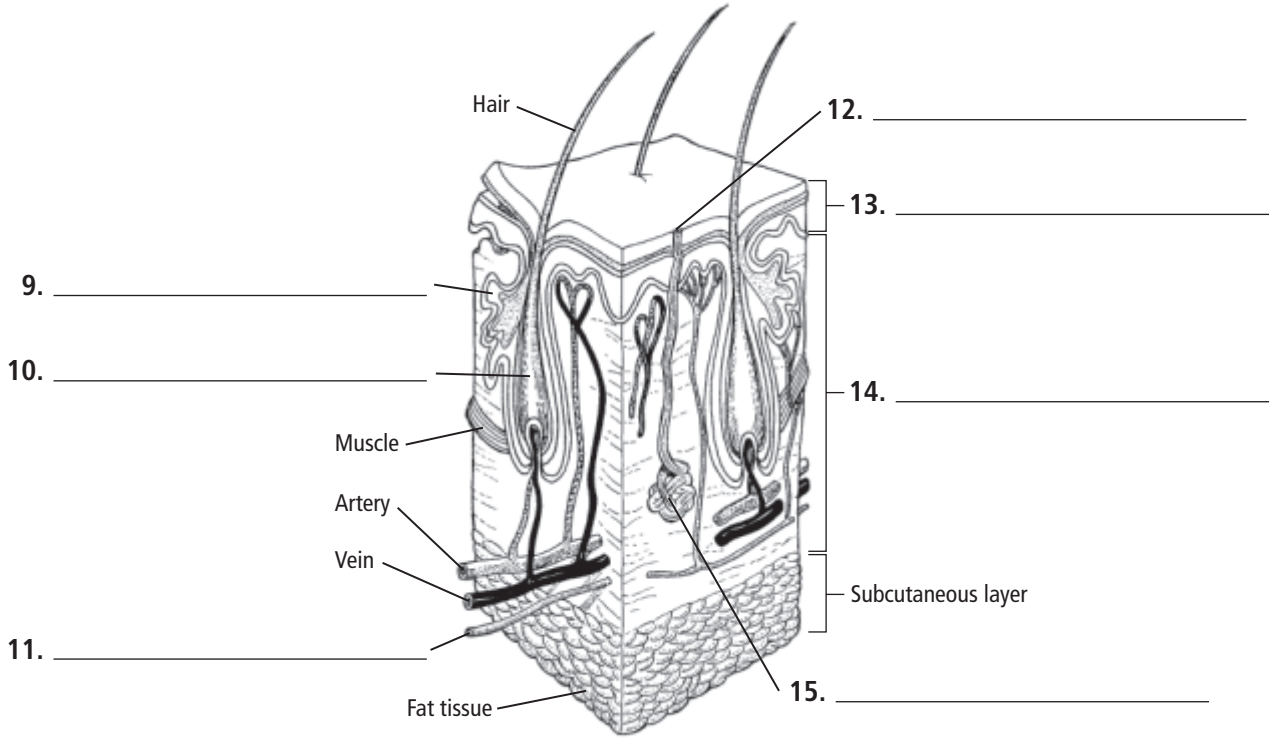
In your textbook, read about the structure of skin.

Complete the table by checking the correct column(s) for each description.

Description	Epidermis	Dermis
1. The outermost layer of skin		
2. Contains connective tissue, glands, and muscles		
3. The thicker, inner layer of skin		
4. Partly composed of dead keratin-containing cells		
5. Contains pigmented cells		
6. Layer from which hair follicles grow		
7. Site of continual mitotic division		
8. Has many blood vessels and nerves		

Label the diagram of the structural parts of skin. Use these choices:

dermis **epidermis** **hair follicle** **nerve**
sebaceous gland **sweat gland** **sweat pore**



Name _____ Date _____ Class _____

Study Guide

CHAPTER 32

Section 2: The Skeletal System

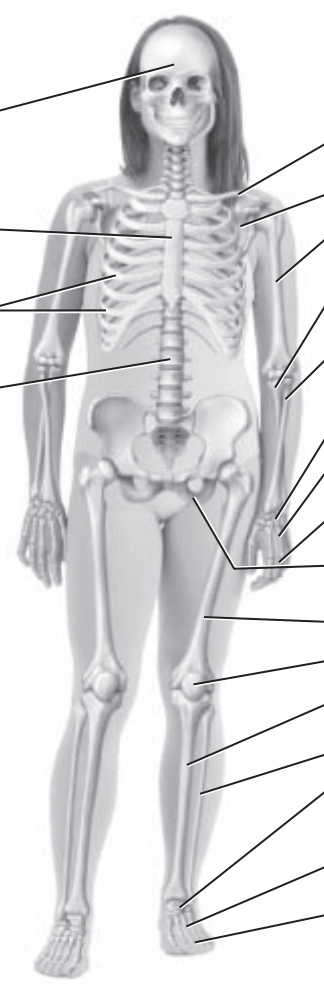
In your textbook, read about the structure of the skeletal system.

Compare the axial skeleton with the appendicular skeleton by examining the illustration below. Label the diagram. Use these choices:

clavicle	**femur**	**humerus**	**metacarpal bones**	**pelvic girdle**
phalanges	**ribs**	**skull**	**sternum**	**tarsal bones**
tibia	**ulna**	**vertebral column**		

Axial

Appendicular

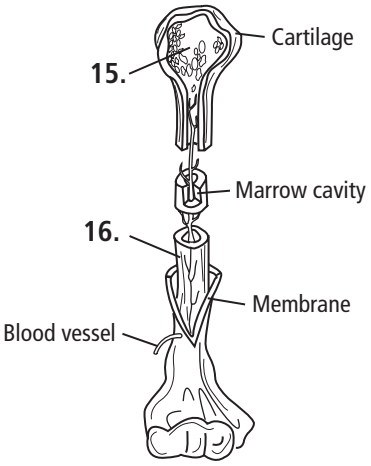


1. _____
2. _____
3. _____
4. _____
5. _____
Scapula
6. _____
7. _____
Radius
Carpal bones
8. _____
9. _____
10. _____
11. _____
Patella
12. _____
Fibula
13. _____
Metatarsal bones
14. _____

In your textbook, read about compact and spongy bone.

Examine the illustration, and identify compact bone and spongy bone in the table. Complete the table by filling in the missing information.

Type of Bone	Description
15.	**17.**
16.	**18.**

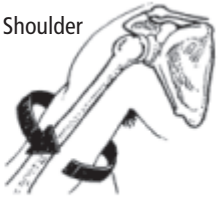


In your textbook, read about joints.

Label the illustrations of the four different types of joints. Use these choices:

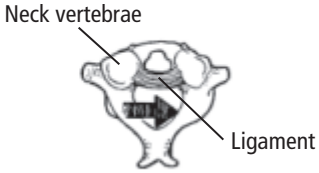
ball-and-socket joint **gliding joint** **hinge joint** **pivot joint**

19. _____



21. _____

20. _____



22. _____

Name _____ Date _____ Class _____

Study Guide

CHAPTER 32

Section 3: The Muscular System

In your textbook, read about the three types of muscle.

Complete the table by filling in the missing information. Use these choices:

cardiac **gap junctions** **heart** **skeletal**
smooth **striated** **tendons** **voluntary**

Muscle Type	Definition
1.	**4.** involuntary; it is not _____ , or striped; each cell has one nucleus
2.	**5.** involuntary; only in the _____ ; striated cells arranged in a network, or web; cells have one nucleus and are connected by _____
3.	**6.** _____ ; attached to bones by _____ ; striated

In your textbook, read about skeletal muscle contraction.

Match the definition in Column A with the term in Column B.

	Column A	Column B
_____	**7.** part of the muscle that contracts	**A.** myofibrils
_____	**8.** smaller units that make up muscle fibers	**B.** sarcomere
_____	**9.** have great endurance and store a lot of oxygen	**C.** myosin and actin
_____	**10.** protein filaments that make up myofibrils	**D.** ATP
_____	**11.** adapted for strength and store little oxygen	**E.** slow-twitch muscles
_____	**12.** energy for muscles provided by cellular respiration	**F.** fast-twitch muscles

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 32
Sección 1: El sistema integumentario

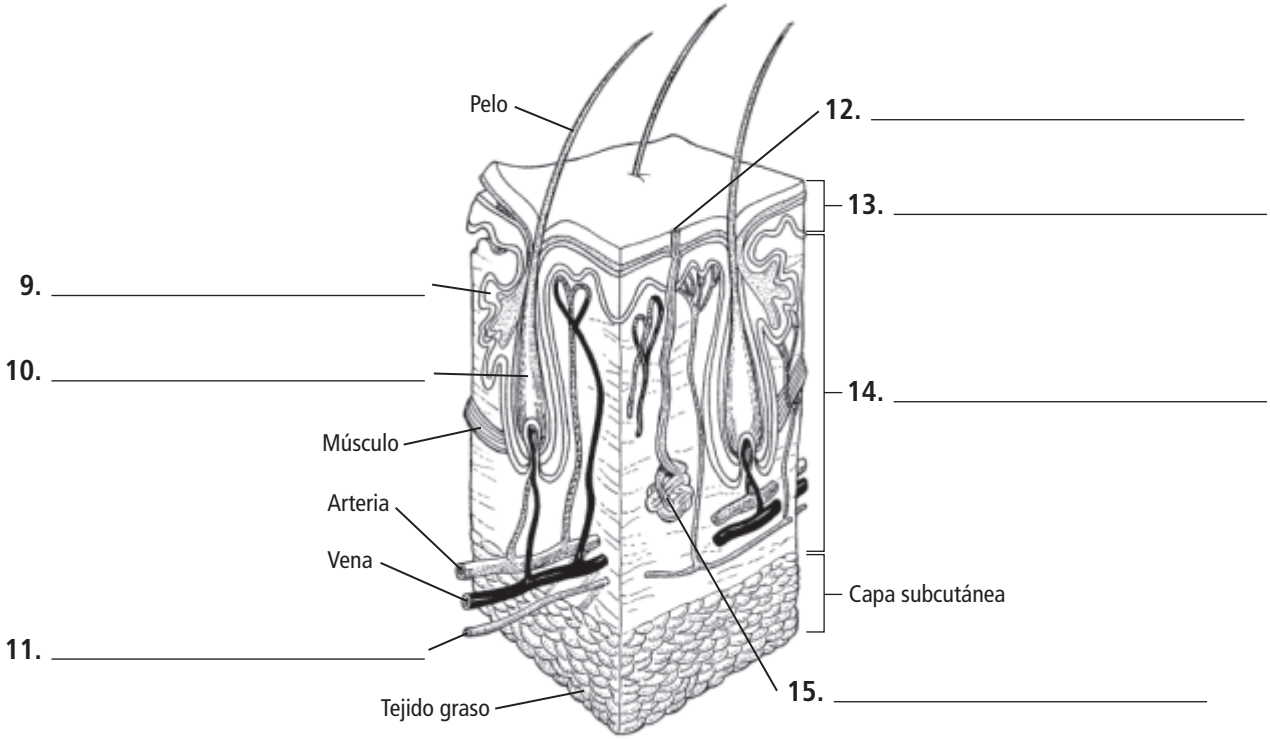
En tu libro de texto, lee acerca de la estructura de la piel.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada descripción.

Descripción	Epidermis	Dermis
1. La capa externa de la piel		
2. Contiene tejido conectivo, glándulas y músculos		
3. La capa interna y más gruesa de la piel		
4. Parcialmente compuesta de células muertas que contienen queratina		
5. Contiene células pigmentadas		
6. Capa de la cual crecen los folículos pilosos		
7. Sitio de división mitótica continua		
8. Tiene muchos vasos sanguíneos y nervios		

Identifica el diagrama de las partes estructurales de la piel. Usa estas opciones:

dermis **epidermis** **folículo piloso** **glándula sebácea**
glándula sudorípara **nervio** **poro sudoríparo**



Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 32

Sección 2: El sistema esquelético

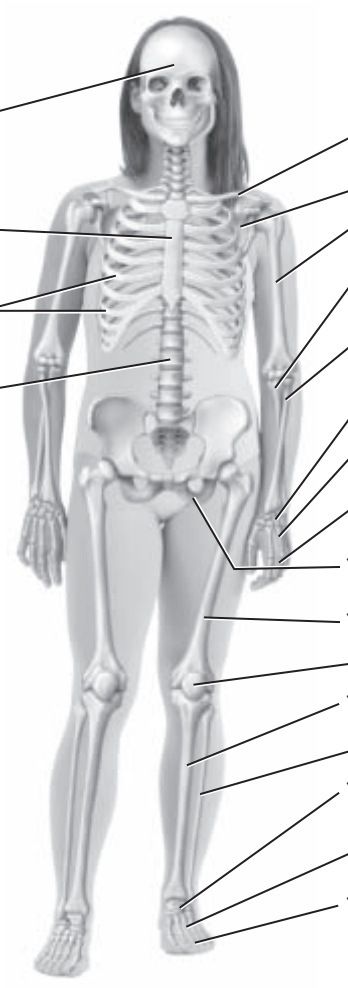
En tu libro de texto, lee acerca de la estructura del sistema esquelético.

Compara el esqueleto axial con el esqueleto apendicular en la siguiente ilustración. Identifica las partes del diagrama. Usa estas opciones:

cinturón pélvico	**clavícula**	**columna vertebral**	**costillas**	**cráneo**
cúbito	**esternón**	**falanges**	**fémur**	**húmero**
huesos metacarpianos	**huesos tarsales**	**tibia**		

Axial

1. _____
2. _____
3. _____
4. _____



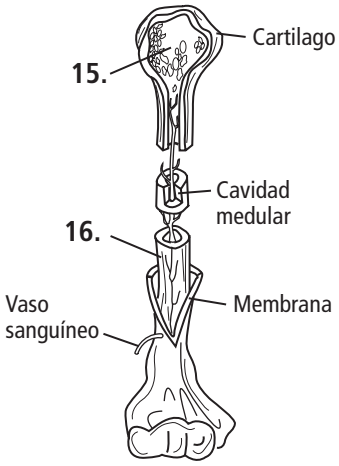
Apendicular

5. _____
Omóplato
6. _____
7. _____
Radio
Huesos carpianos
8. _____
9. _____
10. _____
11. _____
Rótula
12. _____
Peroné
13. _____
Huesos metatarsianos
14. _____

En tu libro de texto, lee acerca del hueso compacto y del hueso esponjoso.

Estudia la ilustración e identifica el hueso compacto y el hueso esponjoso en la tabla. Completa la tabla con la información faltante.

Tipo de hueso	Descripción
15.	**17.**
16.	**18.**

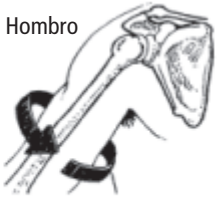


En tu libro de texto, lee acerca de las articulaciones.

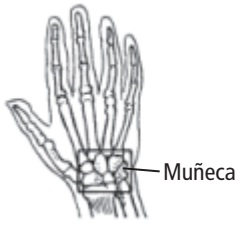
Identifica las ilustraciones de los cuatro diferentes tipos de articulaciones. Usa estas opciones:

articulación de rótula **articulación deslizante** **articulación en bisagra** **articulación en pivote**

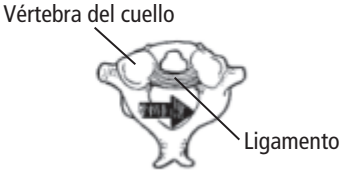
19. _____



21. _____



20. _____



22. _____

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 32

Sección 3: El sistema muscular

En tu libro de texto, lee acerca de los tres tipos de músculo.

Completa la tabla con la información faltante. Usa estas opciones:

cardíaco	**corazón**	**esquelético**	**estriado**
liso	**tendones**	**voluntario**	**uniones puente**

Tipo de músculo	Definición
1.	**4.** involuntario; no es _____ , o rayado; cada célula tiene un núcleo
2.	**5.** involuntario; sólo en el _____ , células estriadas organizadas en una red; las células tienen un núcleo y están conectadas por _____
3.	**6.** _____ ; unido a los huesos por medio de _____ ; estriado

En tu libro de texto, lee acerca de la contracción del músculo esquelético.

Relaciona la definición de la columna A con el término de la columna B.

Columna A	Columna B
_____ **7.** parte del músculo que se contrae	**A.** miofibrillas
_____ **8.** unidades más pequeñas que componen las fibras musculares	**B.** sarcómero
_____ **9.** tienen gran resistencia y almacenan mucho oxígeno	**C.** miosina y actina
_____ **10.** filamentos de proteína que componen las miofribillas	**D.** ATP
_____ **11.** adaptados para dar fuerza y almacenan poco oxígeno	**E.** músculos de fibras lentas
_____ **12.** energía para los músculos proporcionada por la respiración celular	**F.** músculos de fibras rápidas

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 32

Section 1: The Integumentary System

After reading the section in your textbook, respond to each statement.

1. **List** the four types of tissues of the integumentary system.

2. **Summarize** the functions of skin.

3. **Identify** the type of cells from which both hair and nails develop.

4. **Arrange** the following layers of the integumentary system from the outside to the inside: dermal connective tissue with glands and hair follicles, epidermal cells with keratin, epidermal cells with melanin, subcutaneous layer.

5. **Evaluate** who is more likely to have healthy skin as an older adult—a person who spends a lot of time in the Sun and develops a dark tan or a person who limits exposure to the Sun and uses sunscreen. Explain.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 32

Section 2: The Skeletal System

After reading the section in your textbook, respond to each statement.

1. **List** the functions of cartilage.

2. **Describe** the functions of the skeletal system.

3. **Categorize** the following bones as part of the axial skeleton or part of the appendicular skeleton: pelvic girdle, radius, ribs, skull, sternum, and tarsal bones.

4. **Compare** compact bone and spongy bone.

5. **Theorize** how you would determine if a cell is an osteoblast or an osteoclast.

Name _____ Date _____ Class _____

Section
Quick Check

CHAPTER 32
Section 3: The Muscular System

After reading the section in your textbook, respond to each statement.

1. **State** the parts of skeletal muscles. **Describe** their relationship to each other. Use the terms *actin, myofibrils, myosin,* and *sarcomeres* in your answer.

2. **Explain** why muscles are arranged in antagonistic pairs, using the figures below.

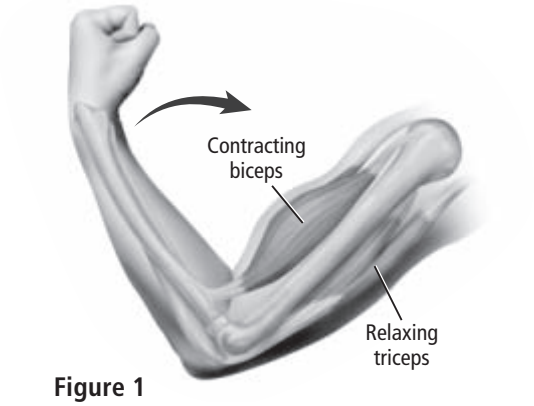


Figure 1

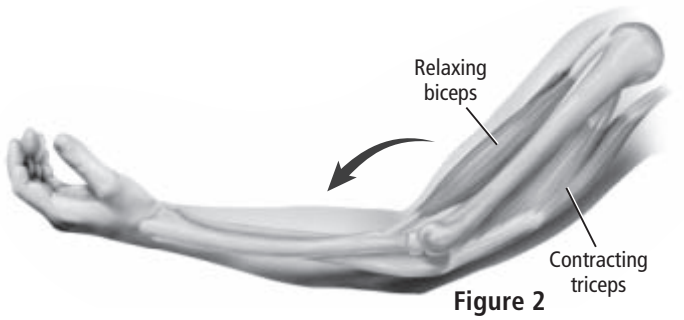


Figure 2

3. **Indicate** how smooth muscle differs from other muscle types.

4. **Speculate** why many people immediately think of only skeletal muscles when the word *muscle* is used.

5. **Evaluate** the attributes of slow-twitch muscles that allow them to have more endurance than fast-twitch muscles.

Name _____ Date _____ Class _____

CHAPTER 32

Assessment Student Recording Sheet

Section 32.1

Vocabulary Review

Explain the difference between the vocabulary terms in each pair.

1. _____

2. _____

3. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓐ Ⓑ Ⓒ Ⓓ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

9. _____

10. _____

11. _____

Think Critically

12. _____

13. _____

Section 32.2

Vocabulary Review

Explain the difference between the vocabulary terms in each pair.

14. _____

Name _____ Date _____ Class _____

CHAPTER 32
Assessment
Student Recording Sheet

15. _____

16. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

17. Ⓐ Ⓑ Ⓒ Ⓓ
18. Ⓐ Ⓑ Ⓒ Ⓓ
19. Ⓐ Ⓑ Ⓒ Ⓓ
20. Ⓐ Ⓑ Ⓒ Ⓓ
21. Ⓐ Ⓑ Ⓒ Ⓓ
22. Ⓐ Ⓑ Ⓒ Ⓓ
23. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

24. _____

25. _____

26. _____

Think Critically

27. _____

28. _____

Section 32.3

Vocabulary Review

Choose the vocabulary term that does not belong, and explain why it does not belong.

29. _____

30. _____

31. _____

Name _____ Date _____ Class _____

CHAPTER 32
Assessment

Student Recording Sheet

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

32. Ⓐ Ⓑ Ⓒ Ⓓ **33.** Ⓐ Ⓑ Ⓒ Ⓓ **34.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

35. _____

_____

_____

_____

36. _____

_____

_____

Think Critically

37. _____

_____

_____

38. _____

_____

_____

Additional Assessment

39. Writing in Biology Record your answer for question 39 on a separate sheet of paper.

Document-Based Questions

40. _____

41. _____

_____

_____

Cumulative Review

42. Record your answer for question 42 on a separate sheet of paper.

Name _____ Date _____ Class _____

CHAPTER 32
Assessment

Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ	**3.** Ⓐ Ⓑ Ⓒ Ⓓ	**5.** Ⓐ Ⓑ Ⓒ Ⓓ	**7.** Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ	**4.** Ⓐ Ⓑ Ⓒ Ⓓ	**6.** Ⓐ Ⓑ Ⓒ Ⓓ	**8.** Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

9. _____

10. _____

11. Record your answer for question 11 on a separate sheet of paper.

12. _____

13. _____

14. _____

15. _____

Extended Response

Answer each question with complete sentences.

16. _____

17. _____

Essay Question

18. Record your answer for question 18 on a separate sheet of paper.

Table of Contents

Reproducible Pages

Chapter 33 Nervous System

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 33
Nervous System

Before reading Chapter 33, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Kareem is completing a project about drug addiction as part of his requirements to be an Eagle Scout. Part of the project involves learning about the neurons that make up the human nervous system. Which does Kareem learn about neurons?

A. Neurons are cells that look like most other cells of the body.
B. Neurons are tissues in the body that carry electrical messages.
C. Specialized cells, called neurons, receive and transmit impulses.
D. Specialized nerves, called neurons, relay pleasure and pain sensations.

Explain.

_____

_____

_____

2. Beth volunteers at the vision center of a local hospital. As part of the orientation process, Beth learns how different structures of the eye function. Which does she learn?

A. Cones and rods in the retina collect information from incoming light.
B. Light-sensitive cells, called rods, provide information about colors.
C. The eye lens captures an image of light and sends it to the brain.
D. The pupil focuses incoming light and images onto the lens of the eye.

Explain.

_____

_____

_____

3. Lilla learns about addictions to drugs during health class. To introduce the topic, Lilla's health teacher defines the term *drug*. What definition does her teacher give?

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 33

How does information travel in the nervous system?

Your body is bombarded by sounds, odors, sights, tastes, and physical contact almost constantly. The nervous system makes sense of these stimuli, and reacts in ways that promote your survival. In this lab, you will model that communication process.

Procedure

1. Form groups of four and assign one student to each of the following roles: a sensor, a relayer, an interpreter, and an actor.
2. Brainstorm situations, such as touching a hot object, in which your senses receive information and you respond.
3. Model one situation. The sensor should describe what he or she senses to the relayer, who passes the information to the interpreter, who decides on a body response. The relayer then passes the response to the actor to act out the response.
4. Repeat step 3 using different situations. Record your observations below.

Data and Observations

Analysis

Explain What factors could cause the situations you modeled to vary in speed?

Name _____ Date _____ Class _____

MiniLab

CHAPTER 33

Investigate the Blink Reflex

What factors affect the blink reflex? Have you ever been in a car when an object hit the windshield? You probably blinked. The blink reflex, in which the eye closes and opens again rapidly, is an involuntary response to stimuli the brain interprets as harmful. Nerve impulses associated with the blink reflex travel short, simple pathways in milliseconds, allowing for rapid reaction time that can prevent eye damage.

Procedure

1. Read and complete the lab safety form.
2. Form a group of three. One person, the subject, should sit behind a 1-m^2 piece of **acrylic.** A second person should monitor and record the subject's responses.
3. The third person should stand 1 m from the barrier and gently toss a **table-tennis ball** so that it hits the barrier.
4. Repeat step 3 and record the subject's response after each trial.
5. Brainstorm variables that might affect the subject's response. Predict the effect of each on the blink reflex.

Data and Observations

Analysis

Interpret Data Did the subject perceive the stimuli in each trial the same way? Explain.

Name _____ Date _____ Class _____

MiniLab

CHAPTER 33

Investigate Adaptations to Darkness

How do light receptors in the retina adapt to low light conditions? The retina contains two types of receptor cells. Cones, adapted for vision in bright light, allow you to perceive color. Rods, adapted for vision in dim light, help you detect shape and movement. The brain combines and interprets nerve impulses received from these cells, making it possible for you to see in various light conditions.

Procedure

1. Work with a partner. Using a **stopwatch,** time how long it takes to separate 30 **plastic bottle caps** into groups based on color.
2. Record the time, the number of caps in each group, and the percent accuracy of the grouping.
3. Predict changes in the data if the experiment is repeated in dim light.
4. Mix the caps into one group. Dim the lights. Immediately repeat step 1.
5. Restore light conditions, and record the data.
6. Discuss the data with your group. Predict changes in the data if the experiment is repeated after five minutes in dim light. Dim the lights.
7. Wait five minutes, and repeat step 1. Restore the light, and record data.

Data and Observations

Analysis

1. **Analyze** Graph the time required and the percent accuracy in each trial. How do these variables compare across trials?

2. **Think Critically** Based on the data, compare the action of the blink reflex (**MiniLab** *Investigate the Blink Reflex*) to the action of the eyes in adjusting to low light conditions.

Name _____ Date _____ Class _____

BioLab

CHAPTER 33

How do neural pathways develop and become more efficient?

Background: Imagine forging a narrow path through a wooded area. As the path is traveled over time, it becomes more defined and easier to follow. In a similar manner, neural pathways are developed in the brain when you learn something new. As you practice what you learned, connections between neurons strengthen, causing nerve impulses to pass more quickly and efficiently along the circuit.

Question: *What effect do learning strategies have on the efficiency of a neural circuit?*

Materials

graph paper
paper
pencil
calculator

Procedure

1. Read and complete the lab safety form.
2. Work with one student in your group to write a list of 20 concrete words that describe specific physical objects. Assign a number, 1 to 20, to each word.
3. Read the list aloud to three test subjects. Immediately, and without discussion, have them write as many words as they can remember from the list.
4. Calculate and record the percent recall for each word: divide the number of subjects who recalled each word by the total number of subjects. Multiply by 100.
5. Graph the percent recall for each word. Note patterns in the data.
6. Calculate the average percent recall: add the percent recall for each word, divide by 20, and multiply by 100.
7. Brainstorm techniques to increase the average percent recall. Choose one technique. Predict how it will affect the average percent recall. Design an experiment to test the prediction.
8. Once your teacher approves the plan, implement it with the same test subjects.
9. Make another list of 20 concrete words that describe specific physical objects.
10. Repeat steps 3–5 to evaluate changes in the average percent recall.

Data and Observations

Analyze and Conclude

1. **Identify** patterns in the percent recall data after the list was read the first time. Which words were most likely to be remembered?

2. **Interpret Data** Describe the technique you used to increase the average percent recall. Compare the average percent recall before and after the technique was used.

3. **Analyze** Did the technique strengthen the neural circuits responsible for remembering the list of words as well as you predicted? Explain.

4. **Error Analysis** Identify factors, other than the technique you used, that might have affected the average percent recall.

Name _____ Date _____ Class _____

Real-World Biology: **Analysis**

CHAPTER 33

Relief from a Patch

Which statements are true?

- Nicotine induces vomiting.
- Nicotine causes high blood pressure.
- Nicotine causes respiratory distress.

Unfortunately for cigarette smokers, all the statements above are true. According to surveys, many of the nation's 50 million cigarette smokers would like to eliminate cigarettes from their lives. However, attempts to quit smoking often fall short because of the addictive properties of nicotine, a major component of cigarette smoke. One popular source of help for this problem is the nicotine skin patch. Nicotine patches are palm-sized pads that, when applied to the skin, release a specific amount of nicotine that travels out of the patch, through the skin, and into the bloodstream. The structural properties of the patch determine the rate at which nicotine is released into the blood. This method keeps a constant low level of nicotine in the body. Although the resulting level of nicotine is less than one would get from smoking, it might be enough to keep one from craving cigarettes or experiencing other withdrawal symptoms.

Part A: How does the nicotine skin patch work?

Figure 1 illustrates how a nicotine skin patch works.

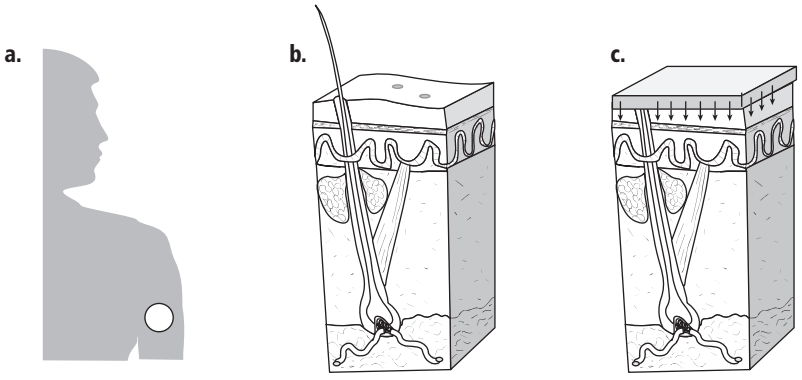


Figure 1

Analyze and Conclude

Respond to each question.

1. **Explain** Why does a person using the nicotine patch not become addicted to the nicotine in the patch as he or she did to the nicotine in cigarettes?

2. **Predict** Would you predict that the patch method is more effective or less effective for helping people quit smoking than gradually cutting down on the number of cigarettes smoked per day? Explain.

Part B: Are nicotine patches effective?

Figure 2 shows data from a study on the effectiveness of nicotine patches for helping people quit smoking.

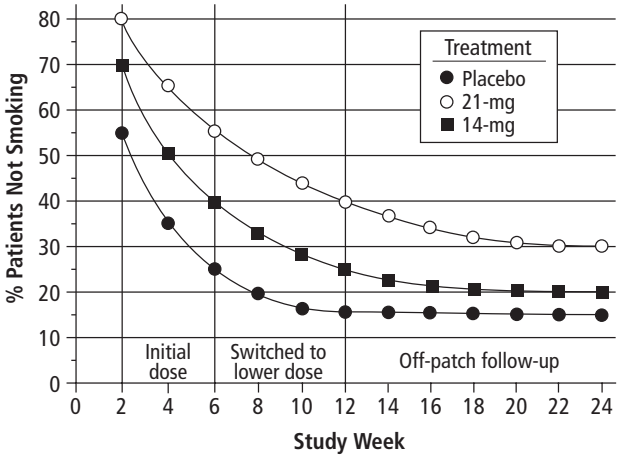


Figure 2a

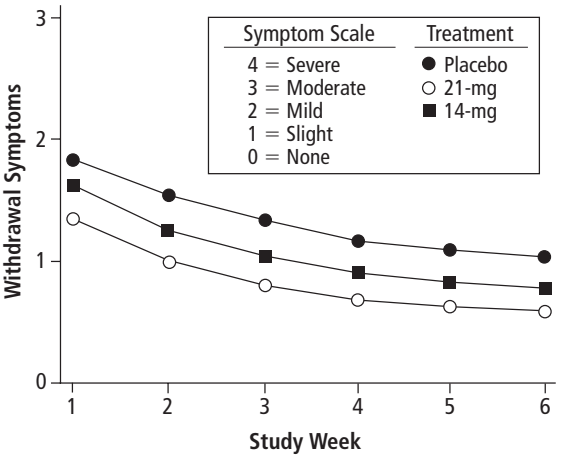


Figure 2b

Analyze and Conclude

*Use **Figures 2a** and **2b** to respond to each question.*

1. **Summarize** According to **Figure 2a,** what percentage of patients receiving the 21-mg nicotine patches remained off cigarettes after 24 weeks? Answer the same question for 14-mg nicotine patches and placebos.

2. **Explain** What was the purpose of the placebo group?

3. **Evaluate** **Figure 2b** shows a graph of the withdrawal symptoms reported by patients during the first six weeks of using the patch. What do these data indicate about the effectiveness of nicotine patches for reducing withdrawal symptoms?

4. **Evaluate** What do these data suggest about the overall effectiveness of nicotine patches? Explain.

CAREERS IN BIOLOGY

Product Development Visit biologygmh.com for information on product development science technicians. What are the responsibilities of product development science technicians?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 33

Diagramming: Nerve Transmission

The synapse between two neurons is a busy region where dozens of molecules are involved in many essential chemical reactions. The introduction of a foreign molecule, such as a toxin, can easily disrupt the delicate balance that makes normal nerve transmission possible. Foreign molecules can induce significant behavioral and mental changes, such as disorientation, lassitude, agitation, and excitement, as well as critical physical changes, such as muscular spasms, convulsions, paralysis, coma, and death.

Botulin and parathion are two toxins that disrupt normal neuronal activity. Botulin is produced by the bacterium Clostridium botulinum. *It is one of the most potent poisons known to humans. Parathion is a member of the organophosphate family, compounds whose molecules contain a phosphate group (PO_4^{2-}) attached to a carbon atom. For many years, parathion was used widely as an insecticide, although its use now has been severely limited because of its toxic effects on humans.*

Draw In the space below, make a diagram that shows how the axon of one neuron, the dendrite of an adjacent neuron, and the synapse between them are related. Show the process by which a neurotransmitter is synthesized, how it is transmitted to the adjacent neuron, and what happens to it after reaching that neuron.

Research After completing your diagram, use library resources to learn how botulin or parathion affects humans. Make a second diagram corresponding to the first diagram that shows where and how either botulin or parathion interferes with the normal process of nerve transmission.

Write On the lines below, describe the behavioral, mental, and physical changes that occur as a result of the action of either botulin or parathion.

_____

_____

_____

_____

_____

_____

Name _____ Date _____ Class _____

Concept Mapping

CHAPTER 33

A Nerve Impulse

Complete the events chain about what happens during a nerve impulse. These terms may be used more than once: axon, channels, dendrites, negative charge, neuron, positive charge.

In a (**1**) _____ at rest, there are more sodium ions outside and more potassium ions inside the cell.

↓

The inside of the cell is negatively charged.

↓

The (**2**) _____ receive a signal.

↓

A threshold stimulus causes (**3**) _____ in the plasma membrane to open.

↓

Sodium ions move into the cells, and the cells get a (**4**) _____ .

↓

More channels open and potassium ions leave the cell, restoring the (**5**) _____ inside the cell.

↓

The change in charge moves down the length of the (**6**) _____ .

Name _____ Date _____ Class _____

Study Guide

CHAPTER 33

Section 1: Structure of the Nervous System

In your textbook, read about neurons.

Use each of the terms below only once to complete the passage.

action potential	**axon**	**chemicals**	**electrical charge**	**electricity**
impulses	**interneurons**	**motor neurons**	**sensory neurons**	**three**

There are three major parts to a neuron. These parts are the cell body, dendrites, and (**1**) _____ . There are (**2**) _____ basic types of neurons. These types include (**3**) _____ , (**4**) _____ , and (**5**) _____ . A nerve impulse is a(n) (**6**) _____ and is called a(n) (**7**) _____ . Neurons use (**8**) _____ and (**9**) _____ to send (**10**) _____ .

In your textbook, read about neurons.

Refer to the illustration below. Match the parts of the illustration with the terms or phrases below. Write the letter of the correct part. Letters may be used more than once.

_____ **11.** nucleus

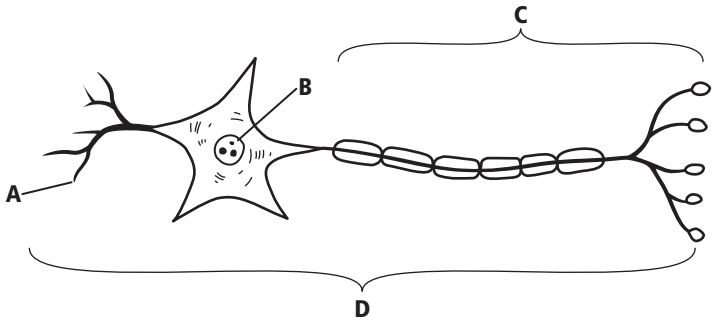
_____ **12.** axon

_____ **13.** dendrite

_____ **14.** part that receives messages

_____ **15.** part that sends messages

_____ **16.** neuron



In your textbook, read about speed of an action potential and the synapse.

For each statement below, write true *or* false.

_____ **17.** Gaps in the myelin sheath of an axon are called nodes.

_____ **18.** All neurons have myelin.

_____ **19.** A synapse is the distance between the dendrites of two neurons.

_____ **20.** Neurotransmitters help to create new action potential.

Name _____ Date _____ Class _____

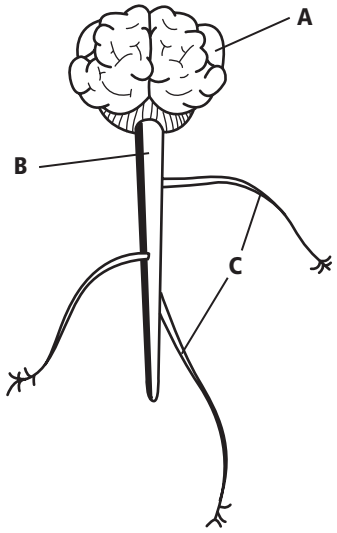
Study Guide

CHAPTER 33

Section 2: Organization of the Nervous System

In your textbook, read about the central nervous system.

Refer to the illustration of the brain and spinal cord. Write the correct letter to identify the structure being described. Letters may be used more than once.



_____ **1.** sends and receives messages from all parts of the body

_____ **2.** protected by the vertebrae

_____ **3.** protected by the skull

_____ **4.** carries messages from skin to spinal cord

_____ **5.** spinal cord

_____ **6.** body nerves

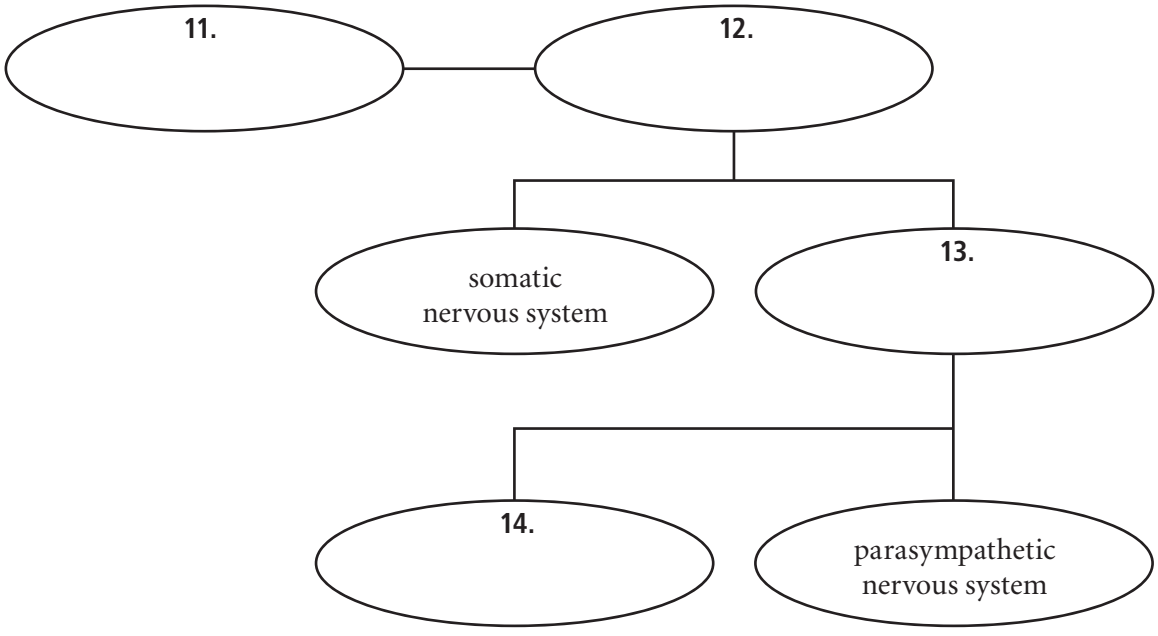
_____ **7.** cerebrum is its largest part

_____ **8.** described as a nerve column

_____ **9.** 31 pairs of nerves extend from it

_____ **10.** more than 100 billion neurons are found here

Complete the graphic organizer about the central nervous system. These terms may be used more than once: autonomic nervous system, central nervous system, peripheral nervous system, sympathetic nervous system.



Name _____ Date _____ Class _____

Study Guide

CHAPTER 33

Section 3: The Senses

In your textbook, read about the senses.

Match the description in Column A with the term in Column B.

	Column A	Column B
_____	**1.** respond to temperature, pressure, and pain	**A.** taste buds
_____	**2.** specialized chemical receptors on the tongue	**B.** sensory receptors
_____	**3.** transmit information about body position	**C.** rods
_____	**4.** light-sensitive cells	**D.** cochlea
_____	**5.** filled with fluid and lined with hair cells	**E.** semicircular canals

In your textbook, read about sight.

Complete the table by filling in the missing information. Use these choices:

cones **cornea** **lens** **retina** **rods**

Function	Structure
Projects image onto the retina	**6.**
Contains receptor cells called rods and cones	**7.**
Is the structure through which light first enters the eye	**8.**
Excited by low levels of light	**9.**
Provide information about color to the brain	**10.**

In your textbook read about hearing and balance.

Use each of the terms below only once to complete the passage.

auditory canal **balance** **cochlea** **hearing**
middle ear **nerve impulses** **tympanum**

Two major functions of the ear are **(11)** _____ and **(12)** _____. Sound waves enter the **(13)** _____ and cause the **(14)** _____ to vibrate. The vibrations travel through the bones of the **(15)** _____ and cause fluid in the **(16)** _____ to vibrate. Hair cells then generate **(17)** _____ that are transmitted to the brain.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 33

Section 4: Effects of Drugs

In your textbook, read about classes of commonly abused drugs.

Complete the table by filling in the missing information.

Drug	Common Examples of Drug and Description of Drug's Effects
Nicotine	**1.**
Caffeine	**2.**
Alcohol	**3.**
Inhalants	**4.**

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 33
Sección 1: Estructura del sistema nervioso

En tu libro de texto, lee acerca de las neuronas.

Usa cada uno de los siguientes términos sólo una vez para completar el párrafo.

axón	**descarga eléctrica**	**electricidad**	**impulsos**	**interneuronas**
neuronas motoras	**neuronas sensoriales**	**potencial de acción**	**químicos**	**tres**

La neurona tiene tres partes principales. Estas partes son el cuerpo celular, las dendritas y el (**1**) _____ . Existen (**2**) _____ tipos básicos de neuronas. Éstos son (**3**) _____ , (**4**) _____ y (e) (**5**) _____ . Un impulso nervioso es una (**6**) _____ , y se le denomina (**7**) _____ . Las neuronas usan (**8**) _____ y (**9**) _____ para enviar (**10**) _____ .

En tu libro de texto, lee acerca de las neuronas.

Consulta la siguiente ilustración. Relaciona las partes de la ilustración con los términos o las frases siguientes. Escribe la letra de la parte correcta. Las letras se pueden usar más de una vez.

_____ **11.** núcleo

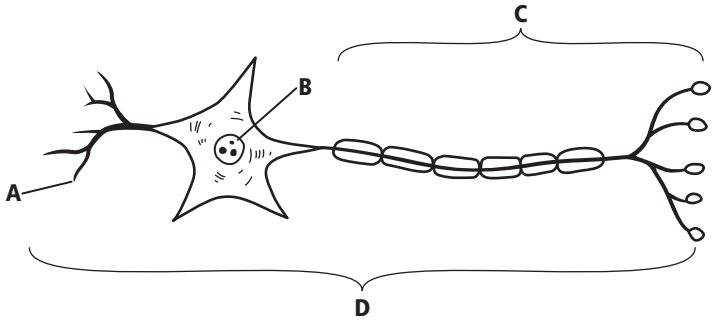
_____ **12.** axón

_____ **13.** dendrita

_____ **14.** parte que recibe mensajes

_____ **15.** parte que envía mensajes

_____ **16.** neuronas



En tu libro de texto, lee acerca de la velocidad de un potencial de acción y la sinapsis.

Para cada afirmación a continuación, escribe «verdadero» o «falso».

_____ **17.** Las hendiduras en la vaina de mielina de un axón se llaman nódulos.

_____ **18.** Todas las neuronas tienen mielina.

_____ **19.** Una sinapsis es la distancia entre las dendritas de dos neuronas.

_____ **20.** Los neurotransmisores ayudan a crear nuevo potencial de acción.

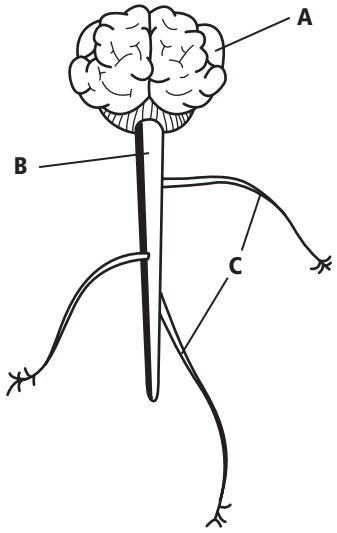
Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 33
Sección 2: Organización del sistema nervioso

En tu libro de texto, lee acerca del sistema nervioso central.

Consulta la ilustración del cerebro y la médula espinal. Escribe la letra correcta para identificar la estructura que se describe. Las letras se pueden usar más de una vez.



_____ **1.** Envía y recibe mensajes de todas las partes del cuerpo.

_____ **2.** Está protegido por las vértebras.

_____ **3.** Está protegido por el cráneo.

_____ **4.** Lleva el mensaje desde la piel hacia la médula espinal.

_____ **5.** Es la médula espinal.

_____ **6.** Son los nervios del cuerpo.

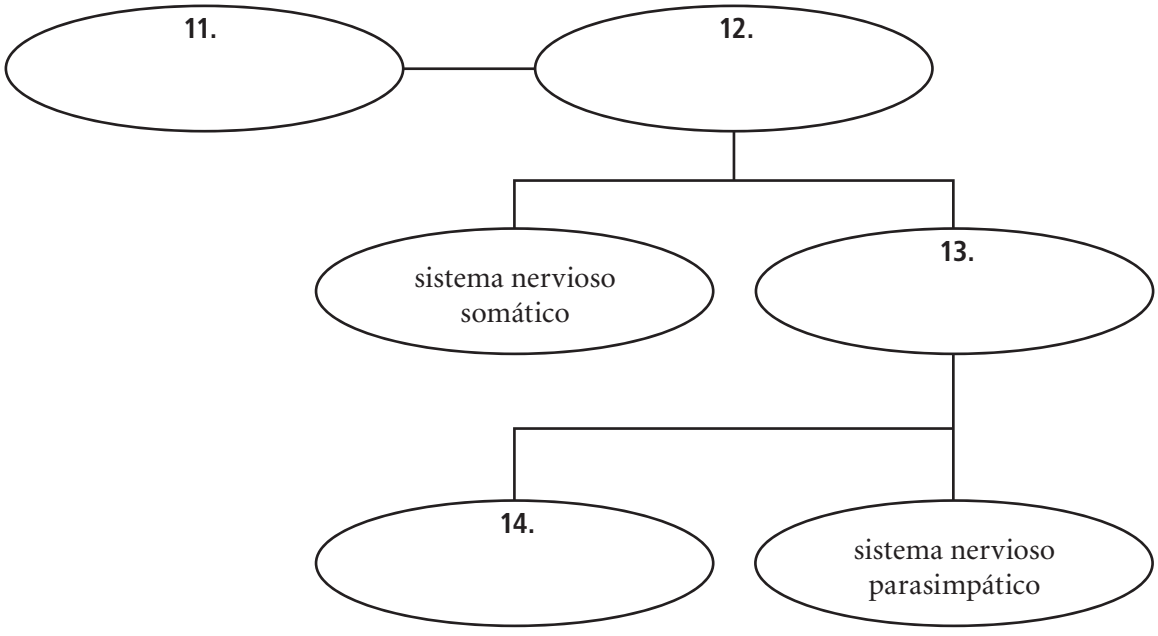
_____ **7.** El cerebro es su parte más grande.

_____ **8.** Se describe como una columna de nervios.

_____ **9.** Treinta y un pares de nervios se extienden desde aquí.

_____ **10.** Aquí se encuentran más de 100,000 millones de neuronas.

Completa el organizador gráfico sobre el sistema nervioso central. Estos términos se pueden usar más de una vez: sistema nervioso autonómico, sistema nervioso central, sistema nervioso periférico, sistema nervioso simpático.



Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 33
Sección 3: Los sentidos

En tu libro de texto, lee acerca de los sentidos.

Relaciona la descripción de la columna A con el término de la columna B.

	Columna A	Columna B
_____	**1.** Responden a la temperatura, la presión y el dolor.	**A.** papilas del gusto
_____	**2.** Son receptores químicos especializados en la lengua.	**B.** receptores sensoriales
_____	**3.** Transmiten información acerca de la posición del cuerpo.	**C.** bastones
_____	**4.** Son células sensibles a la luz.	**D.** cóclea
_____	**5.** Es llena de líquido y forrada con células ciliadas.	**E.** canales semicirculares

En tu libro de texto, lee acerca de la vista.

Completa la tabla con la información faltante. Usa estas opciones:

bastones **conos** **córnea** **lente** **retina**

Función	Estructura
Proyecta la imagen en la retina.	**6.**
Contiene células receptoras llamadas bastones y conos.	**7.**
La luz entra primero al ojo a través de esta estructura.	**8.**
Se excitan con niveles bajos de luz.	**9.**
Ofrecen información al cerebro acerca del color.	**10.**

En tu libro de texto, lee acerca del oído y el equilibrio.

Usa cada uno de los siguientes términos sólo una vez para completar el párrafo.

canal auditivo **cóclea** **equilibrio** **impulsos nerviosos**
oído medio **oír** **tímpano**

Las dos funciones más importantes del oído son **(11)** _____
y mantener el **(12)** _____ . Las ondas de sonido entran por el
(13) _____ y causan que el **(14)** _____ vibre. Las
vibraciones se desplazan a través de los huesos del **(15)** _____ y causan que el
líquido en la **(16)** _____ vibre. Luego, las células ciliadas generan
(17) _____ que son transmitidos al cerebro.

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 33

Sección 4: Efectos de las drogas

En tu libro de texto, lee acerca de las clases de drogas comúnmente usadas.

Completa la tabla con la información faltante.

Droga	Ejemplos comunes de la droga y descripción de sus efectos
Nicotina	**1.**
Cafeína	**2.**
Alcohol	**3.**
Inhalantes	**4.**

Name _____ Date _____ Class _____

Section
Quick Check

CHAPTER 33

Section 1: Structure of the Nervous System

After reading the section in your textbook, respond to each statement.

1. **List** the three main regions of a neuron.

2. **Describe** the path of a signal as it starts from a sensory neuron and goes through a reflex arc.

3. **Explain** how the myelin sheath changes the speed of an action potential.

4. **Compare** the ion content of a neuron at rest to a neuron that has just received a threshold stimulus.

5. Anesthetics are used to reduce feelings of pain. **Hypothesize** about some ways anesthetics might work.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 33

Section 2: Organization of the Nervous System

After reading the section in your textbook, respond to each statement.

1. **Name** the two major divisions of the nervous system and briefly describe their components.

2. **Describe** the structure of the cerebrum.

3. **Differentiate** between the somatic nervous system and the autonomic nervous system.

4. **Formulate** a situation in which your sympathetic nervous system would be active.

5. A boy without a helmet falls on a concrete sidewalk while riding a bike. He hits the back of his head near his neck. **Suggest** some of the problems that might occur from this injury and why.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 33

Section 3: The Senses

After reading the section in your textbook, respond to each statement.

1. **Recall** the location and function of taste buds.

2. **Review** the path that light takes through the eye.

3. **Compare** the functions of the hair cells in the cochlea to the hair cells in the semicircular canals.

4. **Imagine** a situation in which you use at least four sensory receptors. **Describe** the situation.

5. **Deduce** what happens to the size of the pupil of your eye when you turn on a light in a dark room.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 33

Section 4: Effects of Drugs

After reading the section in your textbook, respond to each statement.

1. **Define** *drug.*

2. **Explain** how amphetamines and cocaine both cause feelings of pleasure.

3. **Describe** how tolerance leads to addiction.

4. **Analyze** the differences between the short-term effects and the long-term effects of use of cocaine and amphetamines.

5. **Evaluate** the difference between the biological definition of a drug and what society might define as a drug.

Name _____ Date _____ Class _____

CHAPTER 33
Assessment Student Recording Sheet

Section 33.1

Vocabulary Review

Choose the vocabulary term that does not belong, and explain why it does not belong.

1. _____

2. _____

3. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ

5. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

6. _____

7. _____

Think Critically

8. _____

Section 33.2

Vocabulary Review

Choose the vocabulary term that does not belong, and explain why it does not belong.

9. _____

10. _____

11. _____

Name _____ Date _____ Class _____

CHAPTER 33

Assessment

Student Recording Sheet

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

12. Ⓐ Ⓑ Ⓒ Ⓓ **13.** Ⓐ Ⓑ Ⓒ Ⓓ **14.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

15. Record your answer for question 15 on a separate sheet of paper.

Think Critically

16. Record your answer for question 16 on a separate sheet of paper.

17. _____

_____

Section 33.3

Vocabulary Review

Explain the difference between the vocabulary terms in each pair.

18. _____

_____

19. _____

_____

20. _____

_____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

21. Ⓐ Ⓑ Ⓒ Ⓓ **22.** Ⓐ Ⓑ Ⓒ Ⓓ **23.** Ⓐ Ⓑ Ⓒ Ⓓ **24.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

25. _____

_____

Think Critically

26. _____

_____

27. _____

_____

Name _____ Date _____ Class _____

CHAPTER 33
Assessment

Student Recording Sheet

Section 33.4

Vocabulary Review

Write sentences to compare and contrast each pair of terms.

28. _____

_____

29. _____

_____

30. _____

_____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

31. Ⓐ Ⓑ Ⓒ Ⓓ **32.** Ⓐ Ⓑ Ⓒ Ⓓ **33.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

34. _____

_____

35. _____

_____

Think Critically

36. _____

_____

Additional Assessment

37. Writing in Biology Record your answer for question 37 on a separate sheet of paper.

Document-Based Questions

38. _____

_____

39. Record you answer for question 39 on a separate sheet of paper.

Cumulative Review

40.–42. Record your answers for questions 40–42 on a separate sheet of paper.

Name _____ Date _____ Class _____

CHAPTER 33

Assessment Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ	**3.** Ⓐ Ⓑ Ⓒ Ⓓ	**5.** Ⓐ Ⓑ Ⓒ Ⓓ	**7.** Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ	**4.** Ⓐ Ⓑ Ⓒ Ⓓ	**6.** Ⓐ Ⓑ Ⓒ Ⓓ	**8.** Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

9. _____

_____

_____

10. _____

_____

11. _____

_____

_____

12. _____

_____

13. _____

_____

Extended Response

Answer each question with complete sentences.

14. _____

_____

15. _____

_____

16. _____

_____

_____

Essay Question

17. Record your answer for question 17 on a separate sheet of paper.

Table of Contents

Reproducible Pages

Chapter 34 Circulatory, Respiratory, and Excretory Systems

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 34
Circulatory, Respiratory, and Excretory Systems

Before reading Chapter 34, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Kesia is creating a model of the human circulatory system as part of a science project. She labels all the parts of the heart and the major types of blood vessels. She also includes an explanation of the function of each part of the system. Which would be included in her model?

A. Blood vessels called arteries carry oxygen-rich blood away from the heart.

B. Capillaries are thick blood vessels that carry blood and dissolved gases.

C. The heart is made of one large chamber that pumps blood through the body.

D. Veins are narrow, netlike blood vessels that deliver oxygen to tissues.

Explain.

_____

_____

_____

2. Dr. Danilo Ayala is diagnosing a patient who is having difficulties breathing. After a thorough examination, the doctor concludes that a foreign substance has irritated the patient's respiratory pathways, and the pathways are constricted, making breathing more difficult. Which respiratory disorder would Dr. Danilo Ayala conclude is causing the patient's symptoms?

A. asthma

B. bronchitis

C. emphysema

D. pneumonia

Explain.

_____

_____

_____

3. Tasanee's aunt has been diagnosed with an excretory system disorder. Tasanee is uncertain of the different parts of the excretory system, and she decides to research the system. About what parts of the excretory system does Tasanee learn?

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 34

What changes take place in the body during exercise?

Body systems, including the respiratory and circulatory systems, function together to meet the demands of exercise and to maintain homeostasis. For example, red blood cells circulate throughout the body to deliver oxygen to cells, where it is used to help produce the energy required for exercise. In this lab, you will investigate how body system responses to exercise might be related to each other.

Procedure

1. Read and complete the lab safety form.
2. Do a rhythmic exercise, such as jogging or marching in place, for two minutes. As you exercise, note how your body responds.
3. Make a list of the body system responses you identified as you exercised.

Data and Observations

Analysis

1. **Create** a flowchart showing how these body responses might be related to each other.

2. **Analyze** Propose how one of the body system responses on your list helps regulate the body's internal environment.

Name _____ Date _____ Class _____

MiniLab

CHAPTER 34

Investigate Blood Pressure

How does blood pressure change in response to physical activity? Blood pressure changes from day to day, and throughout the day, and is affected by physical, psychological, behavioral, and inherited factors.

Procedure

1. Read and complete the lab safety form.
2. Watch the instructor demonstrate how to safely take a blood pressure. Practice using a **blood-pressure cuff** to measure a partner's blood pressure. Refer to a **blood-pressure chart** to interpret the reading.
3. Predict how exercise will affect systolic and diastolic blood pressure.
4. Take the resting blood-pressure reading of one member of your group.
5. Have the person whose blood pressure was taken do rhythmic exercise for one minute.
6. Take a second blood-pressure reading, and compare it to the resting blood-pressure reading.

Data and Observations

Analysis

1. **Identify** What are the experimental constants, the independent and dependent variables, and the control in your experiment?

2. **Conclude** Were your predictions supported? Explain.

Name _____ Date _____ Class _____

MiniLab

CHAPTER 34

Recognize Cause and Effect

Does exercise affect metabolism? As you increase your level of exercise, your breathing rate increases. The more you exercise, the harder the circulatory and respiratory systems must work.

Procedure

1. Read and complete the lab safety form.
2. Record the number of heartbeats and number of breaths per minute for ten classmates.
3. Instruct the same students to walk for five minutes. At the end of that time, record each person's heartbeat per minute and number of breaths per minute.
4. After students have rested for five minutes, instruct them to jog or walk briskly for five minutes. Then, record each person's heartbeat per minute and number of breaths per minute.
5. Plot your results on **graph paper.** Each coordinate point should indicate breaths per minute on the horizontal axis and heartbeats per minute on the vertical axis.

Data and Observations

Analysis

1. **Interpret** What is the relationship between the two variables of your experiment—heart rate and breathing rate?

_____

_____

2. **Conclude** Does exercise affect metabolism? Why?

_____

_____

3. **Hypothesize** Identify why different students have different numbers of heartbeats per minute and breaths per minute even though they all walked or jogged for the same amount of time.

_____

_____

Name _____ Date _____ Class _____

BioLab

CHAPTER 34

Internet: Make Positive Health Choices

Background: Both heredity and lifestyle choices affect overall health. Achieving optimal health involves making wise choices regarding exercise, nutrition, drugs and alcohol, stress management, and smoking. Because body systems function together to maintain homeostasis, changes in one system can impact overall health. In this lab, you will design a presentation that focuses on how specific health choices influence the functionality of body systems.

Question: *How do lifestyle choices affect the function of the circulatory, respiratory, and excretory systems?*

Materials

Choose materials that would be appropriate for creating your presentation. Possible materials include:
resource materials from the school library or classroom

Procedure

1. Read and complete the lab safety form.
2. In the space below, develop an outline of information you would like to include in your presentation. Include information about how specific health choices affect the respiratory, circulatory, and excretory systems.
3. Use resources and data you collected in this chapter's labs to determine the effects of specific health choices on your body.
4. Choose a presentation medium. Ideas include a multimedia presentation, video, poster, or pamphlet. The medium you choose should appeal to a specific audience.
5. Share your presentation with your target audience. Post your research and presentation at biologygmh.com so others can benefit from what you have learned.
6. Use the evaluation information provided by your teacher to evaluate the effectiveness of the presentation.

Data and Observations

Analyze and Conclude

1. **Describe** What is the intended audience for your presentation? How did you modify the information included to target this audience?

2. **Summarize** Identify the key points of your presentation.

3. **Explain** How do the health choices you described affect multiple body systems?

4. **Evaluate** Do you think your presentation will influence the health choices of your target audience? Explain.

5. **Critique Your Presentation** How could you increase the effectiveness of your presentation?

Name _____ Date _____ Class _____

Real-World Biology: **Analysis**

CHAPTER 34

The Biology of a Hiccup

Maria has gulped down a cold drink after some vigorous exercise. Suddenly—"Hiccup!" Without any warning, her body is experiencing a bout of hiccups. Maria holds her breath and counts to ten. It works. The hiccups vanish as quickly as they came. Hiccups are common. Everyone has had them at some time, perhaps after eating a large meal or when under stress. Everyone probably has his or her personal remedy for getting rid of them, too. But what causes hiccups, and why do some remedies work better than others? In this activity, you will find the answers to these questions as you investigate the biology of hiccups.

The Biology of a Hiccup

When you breathe in and out, air moves into and out of your lungs because of the rhythmic contraction of the diaphragm, the tough sheet of muscle that separates the chest from the abdominal cavity. The epiglottis, the flap of tissue that prevents food from entering the respiratory passage, is in an open position during breathing and allows for a smooth flow of air. When a hiccup happens, as shown in **Figure 1,** this normal sequence of events is disturbed. Instead of contracting rhythmically, the diaphragm undergoes spasms and begins to twitch uncontrollably. As this occurs, air is gulped, and the epiglottis snaps shut. The typical hiccup sound is produced when air is forced past the vocal cords and then cut off by the epiglottis.

When hiccups occur, one of two mechanisms, possibly both, is involved. Either there is a disturbance in the area of the brain that controls the contraction of the diaphragm, or an imprecise impulse is being sent out along one of the two phrenic nerves. These nerves connect the diaphragm to the central nervous system. Common reasons for getting short-term hiccups are eating or drinking too quickly, eating or drinking too much, eating spicy food, gulping air, or drinking alcohol. Long-term hiccups might be caused by lung diseases or diseases in the other tissues that surround the phrenic nerves.

People use a variety of cures for hiccups. Hiccups are muscle spasms caused by faulty signals from the brain. According to scientists, anything that interrupts these signals or influences the diaphragm to regain its rhythm can halt hiccups.

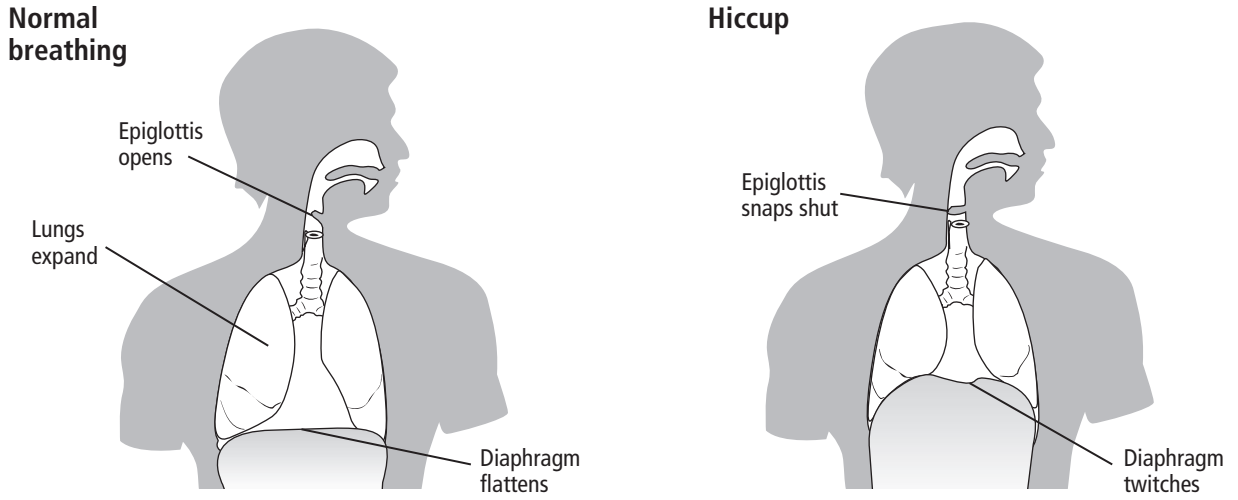


Figure 1

Analyze and Conclude

Respond to each question and statement.

1. **Identify** whether the Normal Breathing diagram in **Figure 1** on the previous page shows a person inhaling or exhaling. Explain.

2. **Generalize** Can you see any similarities in the reasons why people get hiccups? If so, what are they? What might these similarities suggest about the cause of hiccups?

3. **Hypothesize** Suggest a reason why eating or drinking too much can cause hiccups, based on what you know about the biology of hiccups.

4. **Apply** Explain each of the home remedies below, using your knowledge about the biology of hiccups. How might each remedy interrupt the signal from the brain to the diaphragm or help the diaphragm regain its rhythm?

   a. Hold your breath.

   b. Breathe into a paper bag.

   c. Lie on your back and bring your knees to your chest.

   d. Drink water rapidly.

5. **Propose** Do you have another remedy you use for hiccups? Write what it is and why you think it works.

CAREERS IN BIOLOGY

Respiratory Therapy Visit biologygmh.com for information on respiratory therapists. What are the responsibilities of a respiratory therapist?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 34

Diagramming: Blood Circulation Through the Heart and Lungs

The heart pumps 7000 liters of blood through the body every day. In an average lifetime, the heart contracts about 2.5 billion times. The circulatory system transports blood from the heart and lungs through the body. Oxygen-poor blood is pumped to the lungs, where the blood picks up oxygen. The heart then pumps the oxygen-rich blood through the system of blood vessels to the rest of the body.

Systemic Circuit Blood not only transports oxygen to cells throughout the body but also carries cells that protect the body from infection; assists in clotting; transports nutrients, vitamins, and wastes; and helps maintain homeostasis. Blood circulates throughout the body from the heart to the body's cells and back again. This pathway is known as the systemic circuit of the circulatory system.

Pulmonary Circuit The human heart is a four-chambered, hollow, cone-shaped, muscular pump. It is connected to the lungs, the brain, the digestive system, the excretory system, and the rest of the body by an intricate system of arteries, veins, and capillaries. The major circulatory pathway that connects the heart to the lungs is known as the pulmonary circuit.

Directions

In the space below, draw a diagram of the human heart, lungs, and the major connecting blood vessels. Use information from the textbook, as well as resources from the library, to add labels to the diagram. Be sure to label the following: lungs, major veins and arteries, capillaries, and chambers of the heart. Add arrows to illustrate the path of blood through the heart and lungs.

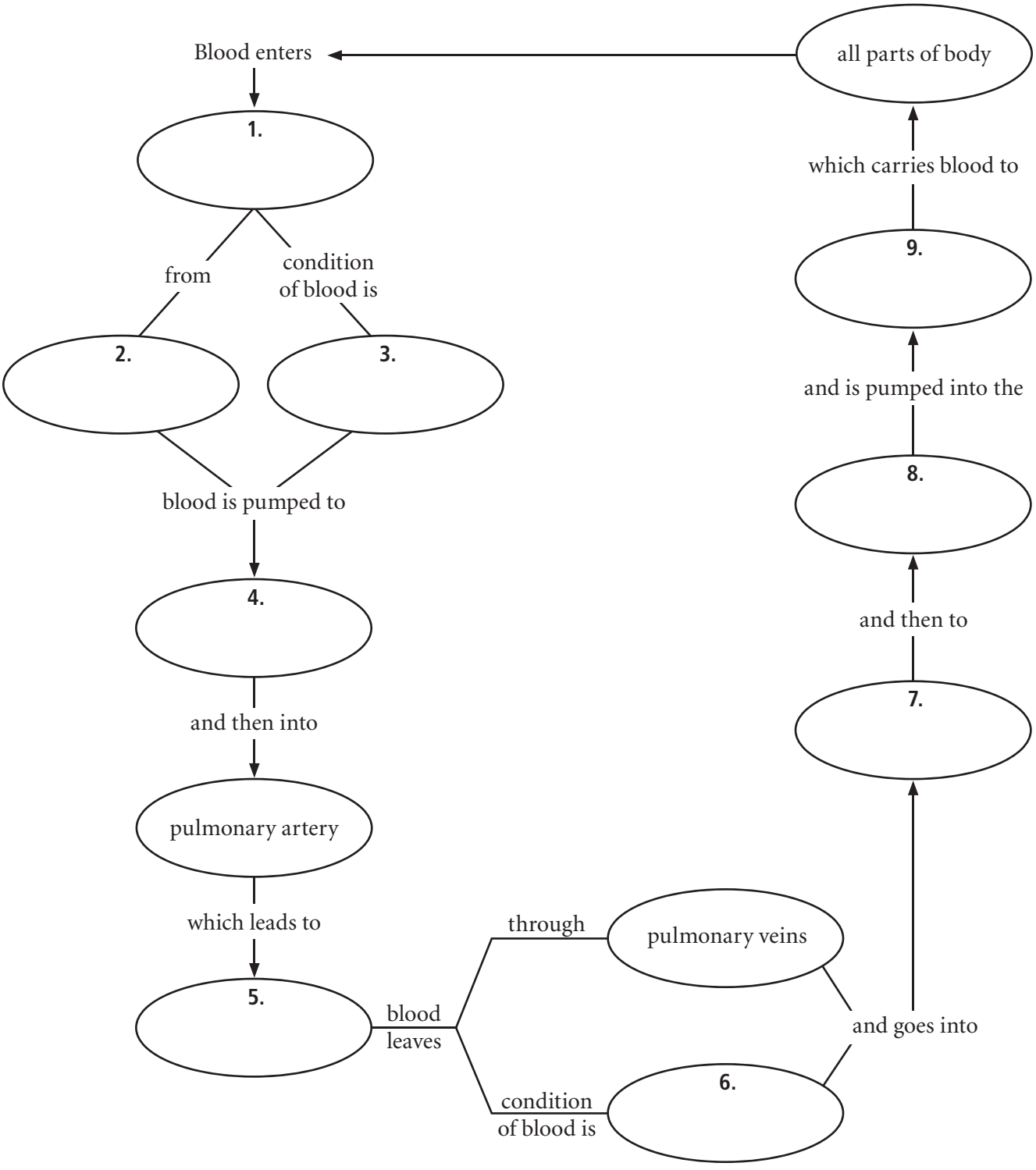
Name _____ Date _____ Class _____

Concept Mapping

CHAPTER 34

Circulation in Humans

Complete the cycle map about circulation in humans. These terms may be used more than once: aorta, high oxygen/low carbon dioxide, left atrium, left ventricle, low oxygen/high carbon dioxide, lungs, right atrium, right ventricle, veins.



Name _____ Date _____ Class _____

Study Guide

CHAPTER 34

Section 1: The Circulatory System

In your textbook, read about the functions of the circulatory system.

If the statement is true, write true. *If the statement is false, replace the italicized word or phrase to make it true.*

1. The circulatory system consists of *three parts: the blood, the heart, and the blood vessels.*

_____

2. The heart pumps blood through a network of tubes inside the body called *blood vessels.*

_____

3. The circulatory system transports *oxygen* and nutrients to cells and removes wastes from body cells.

_____

4. The circulatory system distributes *water* throughout the body to help regulate body temperature.

_____

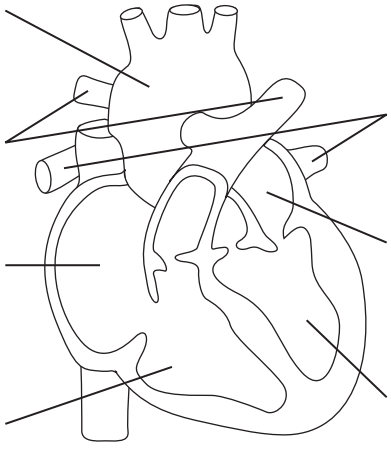
5. The circulatory system contains cell *clots* and proteins.

_____

In your textbook, read about the structure of the heart.

Label the diagram of the human heart. Use these choices:

aorta **left atrium** **left ventricle** **pulmonary arteries**
pulmonary veins **right atrium** **right ventricle**



6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

In your textbook, read about how the heart beats.

Write the term or phrase that best completes each statement. Use these choices:

atrioventricular node **pulse** **sinoatrial node** **systole**

13. A group of cells called the pacemaker, or _____ , in the right atrium sends out signals that tell the heart muscle to contract.

14. The _____ transmits the signal that causes both ventricles to contract.

15. The alternating expansion and relaxation of the artery wall caused by contraction of the left ventricle is the _____ .

16. The blood pressure caused by contraction of the heart is called _____ .

In your textbook, read about blood components.

Complete the table by checking the correct column(s) for each description.

Description	Red Blood Cell	White Blood Cell	Platelet	Plasma
17. Contains hemoglobin				
18. Carries glucose and fats				
19. Lacks a nucleus				
20. Releases chemicals that form fibrin				
21. Transports oxygen				
22. Produced in bone marrow				
23. Clear, yellowish fluid				
24. Helps clot blood				
25. Fights infection				

Name _____ Date _____ Class _____

Study Guide

CHAPTER 34

Section 2: The Respiratory System

In your textbook, read about the importance of respiration.

Use each of the terms below only once to complete the passage.

breathing	**carbon dioxide**	**external**	**internal**
lungs	**oxygen**	**respiration**	

The function of the respiratory system is to sustain cellular **(1)** _____ . This is done by supplying **(2)** _____ to cells and removing **(3)** _____ waste from cells. **(4)** _____ is the mechanical movement of air into and out of the **(5)** _____ . **(6)** _____ respiration is the exchange of gases between the atmosphere and the blood that occurs in the lungs. **(7)** _____ respiration is the exchange of gases between the blood and the body's cells.

In your textbook, read about the path of air.

Match the description in Column A with the structure in Column B.

Column A		Column B
_____ **8.**	large tubes that enter each lung from the trachea	**A.** mouth or nose
_____ **9.**	thin-walled, individual air sacs within the lungs	**B.** trachea
_____ **10.**	small branches off larger tubes within each lung	**C.** bronchi
_____ **11.**	filters out dust; warms and moistens air	**D.** bronchioles
_____ **12.**	branches into two large tubes that go to the lungs	**E.** alveoli

In your textbook, read about breathing.

Mark the figure to the right as each statement directs.

13. Draw red arrows on the figure to show the movement of air and the diaphragm during inhalation.

14. Draw blue arrows on the figure to show the movement of air and the diaphragm during exhalation.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 34

Section 3: The Excretory System

In your textbook, read about the parts of the excretory system and the kidneys.

Complete the table by checking the correct column(s) for each organ.

Primary Material(s) Removed				
Organ	**Salts**	**Carbon Dioxide**	**Water**	**Wastes**
1. Lungs				
2. Skin				
3. Kidneys				

Respond to each statement.

4. Name the major excretory organ in the body.

_____

5. Cite a way that the excretory system helps maintain homeostasis, besides removing wastes, water, carbon dioxide, and salts.

_____

_____

In your textbook, read about the kidneys.

Label the diagram of a nephron. Use these choices:

Bowman's capsule **capillaries** **glomerulus** **convoluted tubule** **to ureter**

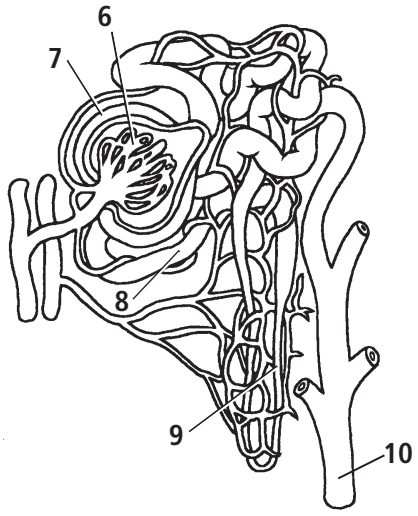
6. _____

7. _____

8. _____

9. _____

10. _____



Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 34
Sección 1: El sistema circulatorio

En tu libro de texto, lee acerca de las funciones del sistema circulatorio.

Si la afirmación es verdadera, escribe «verdadero». Si la afirmación es falsa, substituye el término o la frase en cursiva para volverla verdadera.

1. El sistema circulatorio consta de *tres partes: la sangre, el corazón y los vasos sanguíneos.*

_____

2. El corazón bombea sangre a través de la red de tubos al interior del cuerpo llamados *vasos sanguíneos.*

_____

3. El sistema circulatorio transporta *oxígeno* y nutrientes a las células y retira desechos de las células del cuerpo.

_____

4. El sistema circulatorio distribuye *agua* a través del cuerpo para ayudar a regular la temperatura del cuerpo.

_____

5. El sistema circulatorio contiene *coágulos* de células y proteínas.

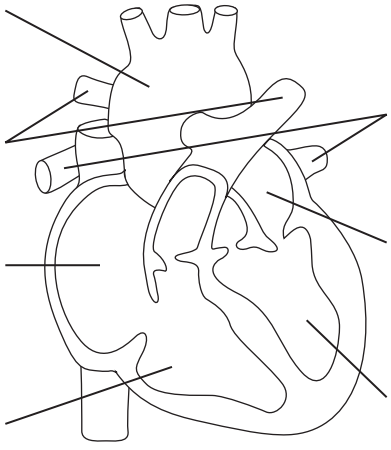
_____

En tu libro de texto, lee acerca de la estructura del corazón.

Identifica en el diagrama las partes del corazón humano. Usa estas opciones:

aorta **arterias pulmonares** **atrio derecho** **atrio izquierdo**
venas pulmonares **ventrículo derecho** **ventrículo izquierdo**

6. _____
7. _____
8. _____
9. _____



10. _____
11. _____
12. _____

En tu libro de texto, lee acerca de cómo late el corazón.

Escribe el término o la frase que mejor complete cada afirmación. Usa estas opciones:

nódulo atrioventricular **nódulo sinoatrial** **pulso** **sístole**

13. Un grupo de células llamadas marcapasos, o _____ , en el atrio derecho envía señales que le indican al músculo del corazón que se contraiga.

14. El _____ transmite la señal que causa que ambos ventrículos se contraigan.

15. La expansión y relajación alternante de la pared arterial causadas por la contracción del ventrículo izquierdo es el _____ .

16. La presión sanguínea causada por la contracción del corazón se denomina _____ .

En tu libro de texto, lee acerca de los componentes de la sangre.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada descripción.

Descripción	Glóbulo rojo	Glóbulo blanco	Plaqueta	Plasma
17. Contiene hemoglobina				
18. Transporta glucosa y grasas				
19. Carece de núcleo				
20. Libera químicos que forman fibrina				
21. Transporta oxígeno				
22. Se produce en la médula ósea				
23. Fluido transparente amarillento				
24. Ayuda a coagular la sangre				
25. Combate la infección				

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 34

Sección 2: El sistema respiratorio

En tu libro de texto, lee acerca de la importancia de la respiración.

Usa cada uno de los siguientes términos solamente una vez para completar el párrafo.

dióxido de carbono	**externa**	**interna**	**oxígeno**
pulmones	**respiración**	**respirar**	

La función del sistema respiratorio es sostener la (**1**) _____ celular. Esto se hace mediante el suministro de (**2**) _____ a las células y la eliminación de desechos de (**3**) _____ de las células. (**4**) _____ es el movimiento mecánico del aire que entra y sale de los (**5**) _____ . La respiración (**6**) _____ es el intercambio de gases entre la atmósfera y la sangre, la cual ocurre en los pulmones. La respiración (**7**) _____ es el intercambio de gases entre la sangre y las células del cuerpo.

En tu libro de texto, lee acerca del trayecto del aire.

Relaciona la descripción de la columna A con la estructura de la columna B.

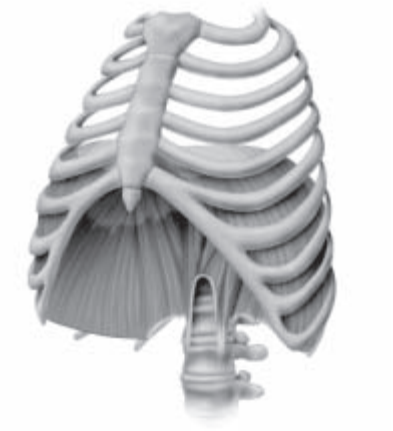
	Columna A	Columna B
_____	**8.** tubos grandes que entran a cada pulmón desde la tráquea	**A.** boca o nariz
_____	**9.** bolsas de aire individuales de pared delgada dentro de los pulmones	**B.** tráquea
_____	**10.** pequeñas ramificaciones que salen de tubos más grandes dentro de cada pulmón	**C.** bronquios
_____	**11.** filtra el polvo; calienta y humedece el aire	**D.** bronquiolos
_____	**12.** se divide en dos tubos grandes que se dirigen a los pulmones	**E.** alvéolos

En tu libro de texto, lee acerca de la respiración.

Marca el dibujo a la derecha según se indica en cada afirmación.

13. Traza flechas rojas en el dibujo para mostrar el movimiento del aire y el diafragma durante la inhalación.

14. Traza flechas azules en el dibujo para mostrar el movimiento del aire y el diafragma durante la exhalación.



Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 34

Sección 3: El sistema excretor

En tu libro de texto, lee acerca de las partes del sistema excretor y los riñones.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada órgano.

Principal(es) material(es) eliminado(s)				
Órgano	**Sales**	**Dióxido de carbono**	**Agua**	**Desechos**
1. Pulmones				
2. Piel				
3. Riñones				

Responde a cada afirmación.

4. Nombra el órgano excretor más importante del cuerpo.

_____

5. Cita una forma en la cual el sistema excretor ayuda a mantener la homeóstasis además de eliminar desechos, agua, dióxido de carbono y sales.

_____

_____

En tu libro de texto, lee acerca de los riñones.

Identifica en el diagrama las partes de un nefrón. Usa estas opciones:

a la uretra **capilares** **cápsula de Bowman** **glomérulo** **túbulo contorneado**

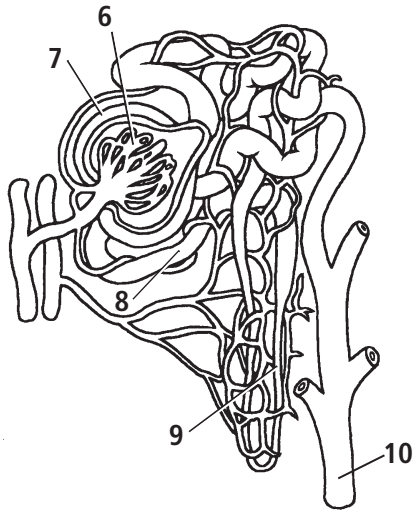
6. _____

7. _____

8. _____

9. _____

10. _____



Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 34

Section 1: The Circulatory System

After reading the section in your textbook, respond to each statement.

1. **Name** the chambers of the heart. **Describe** their positions.

2. **Explain** the functions of the major types of blood vessels. Use the terms *arteries*, *capillaries*, and *veins* in your answer.

3. **Summarize** the functions of the main blood components. Use the terms *plasma*, *red blood cells*, *white blood cells*, and *platelets* in your answer.

4. **Compare** and **contrast** the four types of blood. **Determine** why it is important to know your blood type.

5. **Determine** what assists in the movement of blood through the veins, other than the beating of the heart.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 34

Section 2: The Respiratory System

After reading the section in your textbook, respond to each statement.

1. **Tell** what determines the rate of breathing. **Explain** what causes the rate of breathing to increase.

2. **Define** *breathing*, *inhalation*, and *exhalation*.

3. **Indicate** the path that air takes from where it enters the body to where gases are exchanged before leaving the body.

4. **Discuss** which gases are exchanged at the level of the alveoli.

5. **Predict** what happens when a disease, a disorder, or smoking affects the respiratory system.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 34

Section 3: The Excretory System

After reading the section in your textbook, respond to each statement.

1. **State** the function of nephrons.

2. **List** the main functions of the excretory system.

3. **Explain** the process of reabsorption that takes place in the kidneys.

4. **Illustrate** the basic shape and structure of a kidney. Use the terms *renal cortex, renal medulla,* and *renal pelvis* as labels in your drawing.

5. **Arrange** these terms in the order of urine leaving the kidney and exiting the body: *urinary bladder, urethra, ureters.* **Explain** this urine path.

Name _____ Date _____ Class _____

CHAPTER 34

Assessment Student Recording Sheet

Section 34.1

Vocabulary Review

Write the vocabulary term that best matches each definition.

1. _____ **2.** _____ **3.** _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ **6.** Ⓐ Ⓑ Ⓒ Ⓓ **8.** Ⓐ Ⓑ Ⓒ Ⓓ

5. Ⓐ Ⓑ Ⓒ Ⓓ **7.** Ⓐ Ⓑ Ⓒ Ⓓ **9.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

10. _____

_____

11. _____

_____

Think Critically

12. _____

_____

13. _____

_____

Section 34.2

Vocabulary Review

Write the vocabulary term that best answers each question.

14. _____ **15.** _____ **16.** _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

17. Ⓐ Ⓑ Ⓒ Ⓓ **19.** Ⓐ Ⓑ Ⓒ Ⓓ **21.** Ⓐ Ⓑ Ⓒ Ⓓ

18. Ⓐ Ⓑ Ⓒ Ⓓ **20.** Ⓐ Ⓑ Ⓒ Ⓓ **22.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

23. _____

_____

_____

Name _____ Date _____ Class _____

CHAPTER 34
Assessment
Student Recording Sheet

24. _____

_____

Think Critically

25. _____

_____

Section 34.3

Vocabulary Review

Write the vocabulary term that best answers each question.

26. _____ 27. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

28. Ⓐ Ⓑ Ⓒ Ⓓ
29. Ⓐ Ⓑ Ⓒ Ⓓ
30. Ⓐ Ⓑ Ⓒ Ⓓ
31. Ⓐ Ⓑ Ⓒ Ⓓ
32. Ⓐ Ⓑ Ⓒ Ⓓ
33. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

34. _____

35. _____

_____

36. _____

_____

Think Critically

37. **Careers in Biology** Record your answer for question 37 on a separate sheet of paper.

Additional Assessment

38. **Writing in Biology** Record your answer for question 38 on a separate sheet of paper.

Document-Based Questions

39. _____

40. _____

41. _____

Cumulative Review

42. Record your answer for question 42 on a separate sheet of paper.

Name _____ Date _____ Class _____

CHAPTER 34

Assessment Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓐ Ⓑ Ⓒ Ⓓ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

9. _____

10. _____

11. _____

12. Record your answer for question 12 on a separate sheet of paper.

13. _____

14. _____

Name _____ Date _____ Class _____

CHAPTER 34

Assessment Student Recording Sheet

15. _____

_____

_____

_____

Extended Response

Answer each question with complete sentences.

16. _____

_____

_____

_____

_____

17. _____

_____

_____

_____

_____

18. _____

_____

_____

_____

_____

_____

Essay Question

19. Record your answer for question 19 on a separate sheet of paper.

Table of Contents

Reproducible Pages

Chapter 35 Digestive and Endocrine Systems

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 35
Digestive and Endocrine Systems

Before reading Chapter 35, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Mirna is constructing a model of the human digestive system for health class. As part of the project, she must research the basic structures of the digestive system. What structures does she **not** research as parts of the digestive system?

A. liver, pancreas, and gallbladder
B. mouth and esophagus
C. skeleton and joints
D. stomach and intestines

Explain.

_____

_____

_____

2. Charlotte is learning about nutrition from her parents in an effort to eat a healthier diet. Her father shows her how to read a nutrition label on a can of soup, and he points out the unit used to measure the energy content in food. Which unit does he show her?

A. Calorie
B. gram
C. milliliter
D. serving

Explain.

_____

_____

_____

3. Zahara researches the new food pyramid designed by the United States Department of Agriculture so that she can alter her diet to gain more energy for playing basketball. Which example is part of the new food pyramid?

A. A healthy diet includes equal parts protein and carbohydrates.
B. Junk foods should be no more than 10 percent of a person's diet.
C. Vegetables and grains should be the primary source of nutrients.
D. Whole grain breads and pasta are no better than enriched grains.

Explain.

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 35

How does the enzyme pepsin aid digestion?

The acidic digestive juices in the stomach contain the enzyme pepsin. In this lab, you will investigate the role of pepsin in digestion.

Procedure

1. Read and complete the lab safety form.
2. Label and prepare **three test tubes.**
   A: 15 mL water
   B: 10 mL water, 5 mL **HCl solution**
   C: 5 mL each water, HCl solution, and **pepsin solution**
3. Cut **hard-boiled egg white** portions into pea-sized chunks with a **knife.**
4. Add equal amounts of egg white to each tube. Predict the relative amount of digestion in each test tube.
5. Place test tubes in an **incubator** overnight at 37°C. Record observations the next day.

Data and Observations

Analysis

Evaluate Rank the test tubes based on the amount of digestion that occurred. Based on your results, describe the roles of stomach-pH pepsin in digestion.

Name _____ Date _____ Class _____

MiniLab

CHAPTER 35

Investigate Digestion of Lipids

How do bile salts and pancreatic solution affect digestion? Lipids, or fats, are not water soluble. The body compensates by producing bile, a chemical that breaks apart fat and helps the molecules mix with the watery solution in the small intestine. In this lab, you will investigate the breakdown of lipids.

Procedure

1. Read and complete the lab safety form.
2. Study the lab procedure and construct a data chart.
3. Label **three test tubes.** Add 5 mL **vegetable oil** and 8–10 drops **phenolphthalein** to each. Shake well. If the color is not pink, add **NaOH solution** one drop at a time until the solution turns pink.
4. Add 125 mL water to a **250-mL beaker.** Warm to about 40°C.
5. Prepare the test tubes as follows, then seal each with a **stopper.**
   - Test Tube A: 5 mL **distilled water,** pinch of **bile salt**
   - Test Tube B: 5 mL **pancreatic solution,** pinch of bile salt
   - Test Tube C: 5 mL pancreatic solution
6. Shake each tube to mix the contents and gently place in the beaker. Record your observations.
7. Dispose of test tube contents in the designated container.

Data and Observations

Analysis

1. **Analyze** What did a color change inside a test tube indicate? What caused the change?

_____

_____

_____

2. **Draw Conclusions** Based on your results, describe the roles of bile and pancreatic solution in digestion.

_____

_____

Name _____ Date _____ Class _____

MiniLab

CHAPTER 35

Model the Endocrine System

How do hormones help the body maintain homeostasis? Activities like taking a test or running a race place demands on your body. Your body's responses to these demands cause changes in your body. Your endocrine and nervous systems work together to ensure a stable internal environment.

Procedure

1. Read and complete the lab safety form.
2. Identify a sport or activity. Brainstorm what body actions occur as you prepare for, take part in, and recover from the activity.
3. Imagine you are writing a computer program that your body will follow to complete the activity. Sequence the steps you brainstormed in step 2.
4. Review your program. Insert steps where the endocrine system might secrete hormones to maintain homeostasis. Use your knowledge and available resources to identify the specific hormones involved. Include body responses to these hormones as separate steps.
5. Compare your program with those developed by other students.

Data and Observations

Analysis

1. **Think Critically** Did some of the same hormones appear in most of the other programs you studied in step 5? Why or why not?

_____

_____

_____

2. **Draw Conclusions** List the major body systems represented in your program. What does this show about the range of body functions controlled by the endocrine system?

_____

_____

_____

Name _____ Date _____ Class _____

Design Your Own
BioLab

CHAPTER 35

How does the rate of starch digestion compare among crackers?

Background: Starch digestion begins in the mouth. The enzyme amylase, present in saliva, catalyzes the breakdown of starch into sugar molecules. The smallest of these sugar molecules is glucose, an important energy source. Foods, including crackers, vary in the amount of starch they contain. In this lab, you will compare how quickly starch is digested in several types of crackers to determine the relative amount in each.

Question: *How does the amount of time required for starch digestion by amylase compare among various types of crackers?*

Materials

Choose materials that would be appropriate for this lab. Possible materials include:

variety of crackers
mortar and pestle
test tubes and test tube rack
filter paper
funnels
balance
beaker
Bunsen burner or hot plate
graduated cylinder
iodine solution
droppers
watch glasses
amylase solution

Safety Precautions

WARNING: ***Iodine can irritate and will stain skin.***

Plan and Perform the Experiment

1. Read and complete the lab safety form.
2. Examine three types of crackers. Design an experiment to compare the amount of time required to digest the starch in each. You will use the enzyme amylase to stimulate the digestion of starch. Iodine, a chemical indicator that turns blue-black when starch is present, will indicate when starch digestion is complete.
3. Construct a data chart to record your observations.
4. Consider these points with your group and modify the plan as necessary:
   - What factors will be held constant?
   - Have you established a control sample?
   - How will you know when starch digestion is complete in each sample?
   - How will you keep constant the amount of each type of cracker tested?
   - Will the chart accommodate your data?
5. Make sure your teacher approves your plan before you proceed.
6. Carry out your experiment.
7. **Cleanup and Disposal** Dispose of test tube contents as directed. Clean and return glassware and equipment. Wash hands thoroughly after handling chemicals and glassware.

Data and Observations

Analyze and Conclude

1. **Analyze** How did the amylase affect the starch in the crackers?

2. **Observe and Infer** In which cracker was starch digested most quickly? What does this indicate about the amount of starch in this cracker compared to the others?

3. **Think Critically** What variables among human mouths might affect the action of amylase on starch? Explain.

4. **Error Analysis** Did any steps in your procedure introduce uncontrolled variables into the experiment? Explain how the procedure could be redesigned to make these factors constant.

Name _____ Date _____ Class _____

Real-World Biology: **Analysis**

CHAPTER 35

Choking and the Abdominal Thrust

Would you know what to do if someone around you started choking on a piece of food? With choking consistently ranked as one of the leading causes of accidental death in the United States, knowing what to do in such a respiratory emergency is an important skill. When food or some other object gets stuck in the throat, permanent brain damage or death from asphyxiation can occur after 4 min without air. One important first-aid technique for choking is the abdominal thrust, developed in 1973 by Dr. Henry Heimlich. In this activity, you will take an inside look at the abdominal thrust to see how and why it works.

Part A: The Abdominal Thrust

Swift, decisive action is needed when someone begins to choke on an object blocking the air passage. The abdominal thrust is an emergency technique designed to quickly and effectively dislodge food or another object from the respiratory passage. Read the steps of the abdominal thrust and then answer the questions below.

1. If the choking victim cannot breathe and is standing, quickly stand behind him or her and place your fist with the thumb side against the victim's abdomen. The correct placement of the fist is slightly above the navel but below the rib cage, as shown in **Figure 1.**
2. Grab your fist with the other hand and give four quick and forceful upper thrusts. Do not squeeze on the ribs with your arms. Just use your fist on the abdomen. It might be necessary to repeat this procedure several times until the airway is clear.
3. When the obstructing object is dislodged and moves into the victim's mouth, remove it quickly.
4. The victim should be seen by a doctor or sent to a hospital as soon as possible for observation.

Figure 1

Analyze and Conclude

Respond to each statement.

1. **Describe** Using what you have learned about the digestive and respiratory systems, describe the normal pathways of food and air as they enter the body.

2. **Describe** the pathways of food and air during a choking incident.

Part B: Analyzing the Abdominal Thrust

A detailed look at the anatomy involved in the abdominal thrust can give a better appreciation of this important technique.

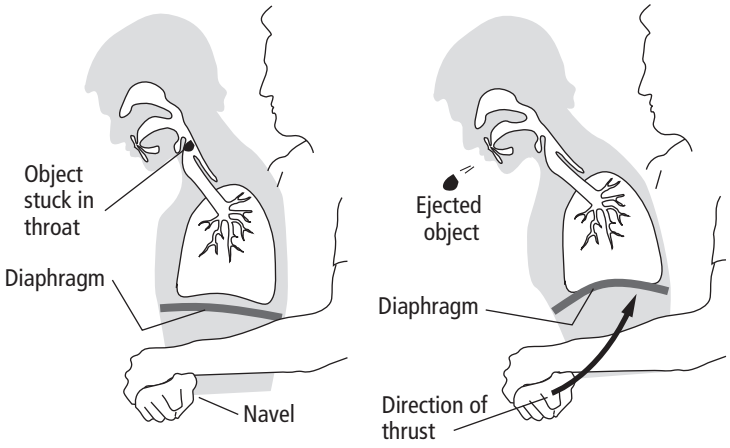


Figure 2

Analyze and Conclude

*Use **Figure 2** to respond to each question and statement.*

1. **Explain** Use your knowledge of the respiratory system to explain how a force applied in the abdominal area can dislodge an object caught in the throat.

2. **Apply** When performing the abdominal thrust on a choking victim, the correct placement of your arms and hands is very important. What problems can result if the abdominal thrust is not performed properly?

3. **Judge** Choking is the cause of nearly 3000 deaths in the United States each year. If a person is choking, should someone at the scene administer the abdominal thrust, or should nothing be done until an emergency medical team arrives? Explain.

CAREERS IN BIOLOGY

Emergency Medicine Visit biologygmh.com for information on emergency medical technicians. What are the responsibilities of an emergency medical technician?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 35

Diagramming: Digestive Compounds at Work in the Body

The food we eat is of no value to our bodies until it has been broken down into simpler components. This process occurs in every part of the digestive system, from the mouth to the intestines. The chemical changes that take place in food during digestion are made possible by enzymes and other compounds that perform many specialized functions.

Research The chart below lists some important enzymes and other compounds that are needed for digestion. Choose one of the compounds to research in detail. Provide the information needed to complete the chart for the compound you have chosen. "Region of Action" means the part of the digestive system where the compound acts. "Source" refers to the organ, tissue, or other body part that supplies the compound.

Compose Work in groups to make a life-size drawing of the human digestive system on a large sheet of paper. Have each person summarize the results of his or her research on an index card. Attach each card to the appropriate region of action on your drawing. Your final labeled drawing should provide a complete summary of the changes that take place in food as it passes through the digestive system and the digestive compounds involved in those changes.

Digestive Compound	Region of Action	Source	Function	Products of Digestive Compound's Action
Ptyalin				
Amylopsin				
Maltase				
Sucrase				
Lactase				
Bile salts				
Pancreatic lipase				
Pepsinogen				
Trypsinogen				
Chymotrypsinogen				

Name _____ Date _____ Class _____

Concept **Mapping**

CHAPTER 35

The Digestion of Food

Complete the flowchart about the digestion of food. These terms may be used more than once: esophagus, feces, large intestine, liver, mechanical digestion, mouth, pancreas, pepsin, stomach.

Food enters the body through the **(1)** _____ , where **(2)** _____ takes place by chewing and digestive enzymes begin chemical digestion.

↓

Food then moves through the **(3)** _____ by peristalsis. It passes through the sphincter and into the **(4)** _____ .

↓

The muscles in the stomach wall contract to break down the food and mix it with stomach secretions at about pH 2. These secretions contain **(5)** _____ for digesting proteins.

↓

In the small intestine, the **(6)** _____ adjusts the pH to a little above pH 7 and provides digestive enzymes. The **(7)** _____ produces bile, which is stored in the gall-bladder until it is needed. Most of the nutrients are absorbed through the villi.

↓

In the **(8)** _____ , water is absorbed, and the waste product becomes solid **(9)** _____ , which are eliminated from the body.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 35

Section 1: The Digestive System

In your textbook, read about the functions of the digestive system.

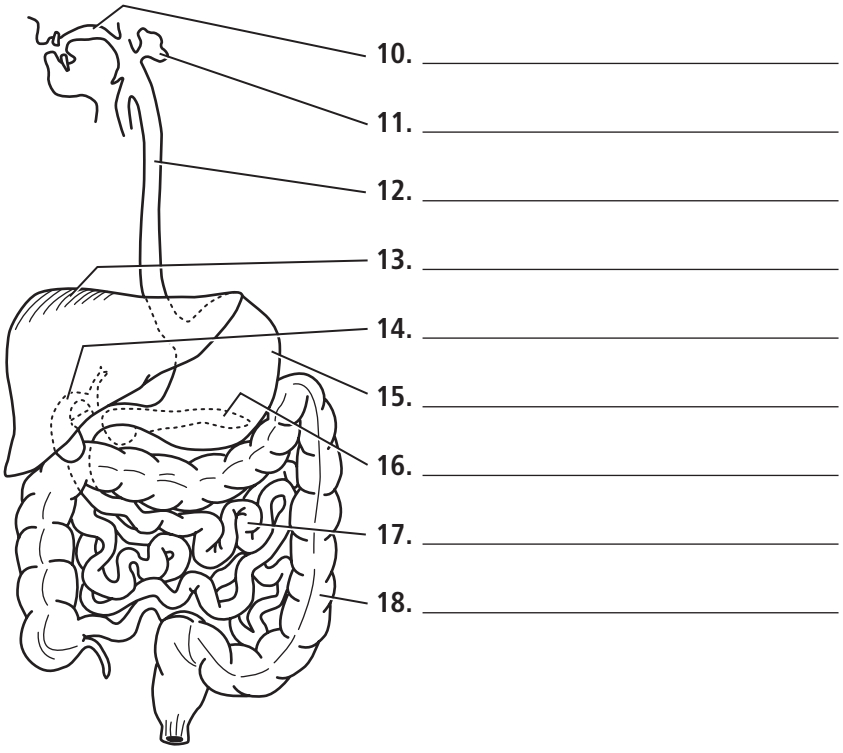
Use each of the terms below only once to complete the passage.

chemical	**chyme**	**colon**	**enzymes**	**hormones**
mechanical	**small intestine**	**three**	**water**	

The digestive system has (**1**) _____ major functions. Digestion can be categorized as either (**2**) _____ or (**3**) _____ . Most nutrients are absorbed in the (**4**) _____ . Accessory organs provide bile, (**5**) _____ , and (**6**) _____ to aid digestion. (**7**) _____ is absorbed from (**8**) _____ in the (**9**) _____ .

Label the diagram of the digestive system. Use these choices:

esophagus	**gallbladder**	**large intestine**	**liver**	**mouth**
pancreas	**salivary glands**	**small intestine**	**stomach**	



In your textbook, read about the small and large intestines.

If the statement is true, write true. *If the statement is false, replace the italicized term or phrase to make it true.*

19. The *pancreas* produces bile, which helps the body break down fats.

20. The largest internal organ of the body is the *liver.*

21. The *gallbladder* produces enzymes, hormones, and an alkaline fluid.

22. Fingerlike structures called *villi* absorb nutrients from food.

23. The *colon* is a small organ with no known function that sometimes gets infected.

Complete the table by checking the correct column(s) for each function.

Function	Small Intestine	Large Intestine
24. Water is absorbed.		
25. Mechanical digestion is completed.		
26. Nutrients are absorbed.		
27. Peristalsis happens.		
28. Undigestible material is collected.		
29. Bile and pancreatic juices are added.		
30. Chemical digestion is completed.		

Respond to each statement.

31. State the function of the gallbladder.

32. Name the part of the digestive system where food spends the most time.

Name _____ Date _____ Class _____

Study Guide

CHAPTER 35

Section 2: Nutrition

In your textbook, read about calories and carbohydrates.

In the space at the left, write the letter of the term or phrase that best completes each statement or answers each question.

_____ **1.** Which of these activities burns more Calories?
- **A.** jogging
- **B.** playing baseball
- **C.** sleeping
- **D.** walking

_____ **2.** Complex carbohydrates, or starches, are found in _____
- **A.** fruit.
- **B.** potatoes.
- **C.** soda pop.
- **D.** sugar.

In your textbook, read about fats and proteins.

For each answer below, write an appropriate question.

3. Answer: Fats supply concentrated energy, serve as building blocks, protect internal organs, and help maintain homeostasis.

Question: _____

4. Answer: because no single plant source contains all eight essential amino acids

Question: _____

In your textbook, read about vitamins and minerals.

Complete the table by checking the correct column(s) for each description.

Description	Vitamins	Minerals
5. Organic compounds		
6. Involved with metabolic activities		
7. Help build bones		
8. Can be produced by bacteria		
9. Essential part of a healthy diet		
10. Inorganic compounds		

Name _____ Date _____ Class _____

Study Guide

CHAPTER 35

Section 3: The Endocrine System

In your textbook, read about the action of hormones.

For each statement below, write true *or* false.

_____ **1.** Endocrine glands produce hormones.

_____ **2.** A hormone is an inorganic compound used as building material in the body.

_____ **3.** Estrogen, testosterone, and insulin are examples of steroid hormones.

In your textbook, read about the endocrine glands and their hormones.

Complete the table by filling in the missing information.

Gland	Example of a Hormone or Substance That the Gland Secretes	Function of Hormone or Substance
Pancreas	**4.**	accelerates the conversion of glucose to glycogen
Adrenal glands	**5.**	**6.**
Thyroid	thyroxine	**7.**
Pituitary gland	**8.**	**9.**

In your textbook, read about the link to the nervous system.

Number the steps in the order in which they occur, showing the responses of the endocrine and nervous systems to dehydration.

_____ **10.** ADH travels in the blood to the kidneys.

_____ **11.** ADH bonds to receptors on kidney cells.

_____ **12.** The water in urine decreases; the water in the blood increases.

_____ **13.** The kidneys reabsorb more water.

_____ **14.** The hypothalamus releases ADH.

_____ **15.** The water level in the body is low.

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 35

Sección 1: El sistema digestivo

En tu libro de texto, lee acerca de las funciones del sistema digestivo.

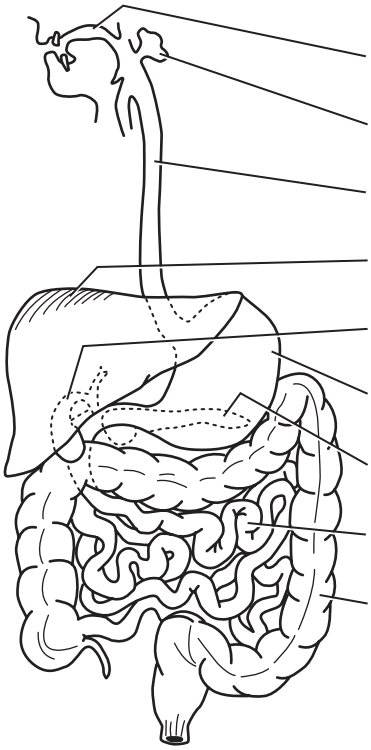
Usa cada uno de los siguientes términos sólo una vez para completar el párrafo.

agua	**colon**	**enzimas**	**hormonas**	**intestino delgado**
mecánica	**química**	**quimo**	**tres**	

El sistema digestivo tiene (**1**) _____ funciones principales. La digestión se puede clasificar como (**2**) _____ o (**3**) _____ . La mayoría de los nutrientes se absorben en el (**4**) _____ . Los órganos accesorios suministran bilis, (**5**) _____ y (**6**) _____ para ayudar en la digestión. El (**7**) _____ se absorbe del (**8**) _____ en el (**9**) _____ .

Identifica el diagrama del sistema digestivo. Usa estas opciones:

boca	**esófago**	**estómago**	**glándulas salivales**	**hígado**
intestino delgado	**intestino grueso**	**páncreas**	**vesícula biliar**	



10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

En tu libro de texto, lee acerca del intestino delgado y del intestino grueso.

Si la afirmación es verdadera, escribe «verdadero». Si la afirmación es falsa, substituye el término o la frase en cursiva para volverla verdadera.

19. *El páncreas* produce bilis, la cual ayuda al cuerpo a descomponer las grasas.

20. El órgano interno más grande del cuerpo es *el hígado.*

21. *La vesícula* produce enzimas, hormonas y un fluido alcalínico.

22. Las estructuras en forma de dedos llamadas *vellos* absorben los nutrientes de los alimentos.

23. *El colon* es un órgano pequeño sin ninguna función conocida que algunas veces se infecta.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada función.

Función	Intestino delgado	Intestino grueso
24. Se absorbe el agua.		
25. La digestión mecánica se completa.		
26. Se absorben los nutrientes.		
27. Ocurre la peristalsis.		
28. Se recolecta el material indigestible.		
29. Se agregan la bilis y los jugos pancreáticos.		
30. Se completa la digestión química.		

Responde a cada afirmación.

31. Indica la función de la vesícula biliar.

32. Nombra la parte del sistema digestivo donde la comida permanece la mayor parte del tiempo.

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 35

Sección 2: La nutrición

En tu libro de texto, lee acerca de las calorías y los carbohidratos.

En el espacio a la izquierda, escribe la letra del término o de la frase que mejor completa cada afirmación o responde a cada pregunta.

_____ **1.** ¿Cuál de estas actividades quema más calorías?
- **A.** caminar
- **B.** dormir
- **C.** jugar béisbol
- **D.** trotar

_____ **2.** Los carbohidratos complejos, o almidones, se encuentran en _____
- **A.** el azúcar.
- **B.** las bebidas gaseosas.
- **C.** las frutas.
- **D.** las papas.

En tu libro de texto, lee acerca de las grasas y las proteínas.

Para cada respuesta a continuación, escribe una pregunta adecuada.

3. Respuesta: Las grasas brindan energía concentrada, sirven como bloques edificantes, protegen los órganos internos y ayudan a mantener la homeóstasis.

Pregunta: _____

4. Respuesta: porque ninguna planta individual contiene los ocho aminoácidos esenciales

Pregunta: _____

En tu libro de texto, lee acerca de las vitaminas y minerales.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada descripción.

Descripción	Vitaminas	Minerales
5. Son compuestos orgánicos.		
6. Participan en las actividades metabólicas.		
7. Ayudan a edificar los huesos.		
8. Pueden ser producto de las bacterias.		
9. Son parte esencial de una dieta saludable.		
10. Son compuestos inorgánicos.		

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 35

Sección 3: El sistema endocrino

En tu libro de texto, lee acerca de la acción de las hormonas.

Para cada afirmación a continuación, escribe «verdadero» o «falso».

_____ **1.** Las glándulas endocrinas producen hormonas.

_____ **2.** Una hormona es un compuesto inorgánico que se usa como material edificante en el cuerpo.

_____ **3.** El estrógeno, la testosterona y la insulina son ejemplos de hormonas esteroides.

En tu libro de texto, lee acerca de las glándulas endocrinas y sus hormonas.

Completa la tabla con la información faltante.

Glándula	Ejemplo de una hormona o sustancia secretada por la glándula	Función de la hormona o sustancia
Páncreas	**4.**	Acelera la conversión de la glucosa en glicógeno.
Glándulas adrenales	**5.**	**6.**
Tiroides	tiroxina	**7.**
Glándula pituitaria	**8.**	**9.**

En tu libro de texto, lee acerca de la relación con el sistema nervioso.

Enumera los pasos en el orden en el cual ocurren, de manera que indiquen las respuestas del los sistemas endocrino y nervioso a la deshidratación.

_____ **10.** La hormona antidiurética (HAD) se desplaza por la sangre hacia los riñones.

_____ **11.** La hormona antidiurética (HAD) se une a los receptores en las células del riñón.

_____ **12.** El agua en la orina disminuye; el agua en la sangre aumenta.

_____ **13.** Los riñones vuelven a absorber más agua.

_____ **14.** El hipotálamo libera hormona antidiurética (HAD).

_____ **15.** El nivel de agua en el cuerpo es bajo.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 35

Section 1: The Digestive System

After reading the section in your textbook, respond to each statement.

1. **Arrange** the following organs in the order in which food passes through them in the digestive system: esophagus, large intestine, mouth, small intestine, stomach.

2. **Identify** the three areas of the digestive system in which mechanical digestion takes place.

3. **Summarize** what happens to food as it moves through the digestive system.

4. Diarrhea is a condition in which the feces contain too much water. **Deduce** which part of the digestive system is malfunctioning for this to occur.

5. A person's gallbladder might need to be surgically removed when he or she has problems with gallstones. **Speculate** about what effect removal of the gallbladder will have. Explain.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 35

Section 2: Nutrition

After reading the section in your textbook, respond to each question and statement.

1. **Tell** What is an essential amino acid, and how are essential amino acids different from other amino acids used by humans in protein synthesis?

2. **Describe** what MyPyramid is.

3. **Explain** why the daily input of energy from food should equal the amount of energy a person uses daily.

4. **Calculate** You and your friend sit down to watch a movie. You have a bag of tortilla chips. After the movie is over, you realize that you have eaten the entire bag of chips. According to the nutrition label on the chips, each 28-g serving contains 147 Calories, and there are 20 servings per bag. Assuming that you and your friend ate equal amounts, how many Calories did each of you consume? Show your work.

5. **Suggest** a good weight-loss strategy. **Consider** both diet and exercise.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 35

Section 3: The Endocrine System

After reading the section in your textbook, respond to each statement.

1. **List** the glands of the endocrine system.

2. **Describe** what happens during an "adrenaline rush."

3. **Contrast** the way steroid and nonsteroid, or amino acid, hormones interact with the plasma membrane of their target cell.

4. **Organize** Pair the following with the hormones they secrete.
   Glands: adrenal glands, hypothalamus, pituitary gland, thyroid
   Hormones: antidiuretic hormone, calcitonin, cortisol, human growth hormone

5. **Conclude** some of the ways a thyroid malfunction that affects thyroxine can affect an adult. Explain.

Name _____ Date _____ Class _____

CHAPTER 35

Assessment Student Recording Sheet

Section 35.1

Vocabulary Review

Choose the vocabulary term that does not belong, and explain why it does not belong.

1. _____

_____

2. _____

_____

3. _____

_____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ **5.** Ⓐ Ⓑ Ⓒ Ⓓ **6.** Ⓐ Ⓑ Ⓒ Ⓓ **7.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

8. _____

_____

9. Record your answer for question 9 on a separate sheet of paper.

10. _____

_____

_____

_____

Think Critically

11. _____

_____

12. _____

_____

Section 35.2

Vocabulary Review

Explain the difference between the vocabulary terms in each pair.

13. _____

_____

Name _____ Date _____ Class _____

CHAPTER 35
Assessment
Student Recording Sheet

14. _____

15. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

16. Ⓐ Ⓑ Ⓒ Ⓓ 17. Ⓐ Ⓑ Ⓒ Ⓓ 18. Ⓐ Ⓑ Ⓒ Ⓓ 19. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

20. **Careers in Biology** _____

21. _____

Think Critically

22. _____

23. _____

Section 35.3

Vocabulary Review

Write sentences to compare and contrast each pair of terms.

24. _____

25. _____

26. _____

Name _____ Date _____ Class _____

CHAPTER 35
Assessment Student Recording Sheet

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

27. Ⓐ Ⓑ Ⓒ Ⓓ **28.** Ⓐ Ⓑ Ⓒ Ⓓ **29.** Ⓐ Ⓑ Ⓒ Ⓓ **30.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

31. _____

_____

_____

32. _____

_____

Think Critically

33. _____

_____

_____

34. _____

_____

Additional Assessment

35. Writing in Biology Record your answer for question 35 on a separate sheet of paper.

Document-Based Questions

36. _____

37. _____

_____

38. _____

_____

Cumulative Review

39. _____

_____

_____

40. _____

_____

41. Record your answer for question 41 on a separate sheet of paper.

Name _____ Date _____ Class _____

CHAPTER 35

Assessment Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

Extended Response

Answer each question with complete sentences.

14. _____

15. _____

16. Record your answer for question 16 on a separate sheet of paper.

Essay Question

17. Record your answer for question 17 on a separate sheet of paper.

Table of Contents

Reproducible Pages

Chapter 36 Human Reproduction and Development

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 36
Human Reproduction and Development

Before reading Chapter 36, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Mika has learned that his aunt is pregnant with her first child. His aunt is taking a course about pregnancy and reading books on the topic to become knowledgeable about the development of the baby. About once a week, Mika's aunt comes over for dinner, and his family discusses how the fetus is developing inside the uterus. During her pregnancy term, which would Mika's aunt include in her dinner conversations?

A. Her doctor told her that she could drink alcohol during the first trimester.

B. She feels the first kicks of the baby at week 21, during the second trimester.

C. The baby's heartbeat can be heard without a stethoscope after 24 weeks.

D. The fetus' lungs and heart begin to develop during the third trimester.

Explain.

_____

_____

_____

2. Alesha has turned 18 years old and is entering adulthood. Which will probably occur during Alesha's adult life before the age of 50?

A. decreased bone length

B. increased height

C. increased metabolism

D. loss of muscle mass

Explain.

_____

_____

_____

3. Robert and Julia are fifth-graders who are taking gender-segregated sex education classes at their school. In class, they learn about the changes a person can expect during adolescence. Discuss possible changes they will learn.

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 36

Sex Cell Characteristics

How are sex cells specialized for the formation of a zygote? Reproduction is a process which follows a predictable pattern. The production of sex cells is a crucial step in reproduction. Sperm and egg cells have specific characteristics that support their roles in reproduction. In this lab, you will investigate how the design of sex cells supports their function.

Procedure

1. Read and complete the lab safety form.
2. Observe the **slide of the egg cell** under the **microscope** and identify its characteristics. Make a sketch.
3. Observe the **slide of the sperm cell** under the **microscope** and identify its characteristics. Make a sketch.

Data and Observations

Analysis

1. **Compare** and **contrast** the sperm and egg cells you studied. How do they differ?

2. **Identify** What structures and characteristics did you observe that might affect each cell's role in reproduction?

Name _____ Date _____ Class _____

MiniLab

CHAPTER 36

Model Sex Cell Production

Why does meiosis produce four sperm but only one egg? The difference in the division of cytoplasm is the major reason meiosis is different in human males and females. Use clay to model how the sex cells are produced during meiosis.

Procedure

1. Read and complete the lab safety form.
2. Choose **two lumps of clay,** each of a different color. Choose one to represent a primary spermatocyte and the other a primary oocyte.
3. Use the primary spermatocyte to simulate the meiotic divisions as they occur in males.
4. Simulate maturation of the sperm by removing about half of the clay from each sperm and using a small part of it to add a flagellum to each cell.
5. Next simulate the first meiotic division in females.
6. Use one of the sperm and mold it to one side of the large cell. Now simulate the second meiotic division.

Analysis

1. **Use Models** Make drawings of each step of the simulation above and label the following: primary spermatocyte and oocyte, egg, sperm, first polar body, second polar body, fertilized egg, and zygote.

2. **Explain** What is the benefit of meiosis concentrating most of the cytoplasm into one egg?

_____

_____

_____

Name _____ Date _____ Class _____

MiniLab

CHAPTER 36

Sequence Early Human Development

What developmental changes occur during the first eight weeks of life? Fertilization begins when a sperm penetrates the egg. The zygote undergoes predictable developmental changes. Cell division produces increasing numbers of cells. Cells move and arrange themselves to form specific organs, making it possible for cells to perform specific functions.

Procedure

1. Visit biologygmh.com to see **images of embryos.**
2. Study the images and information provided for Stage 1 through Stage 23, the first ten weeks after fertilization. Choose one factor to track through this developmental period. Factors might include embryonic size, cell differentiation, overall structural changes, specific organ or organ system development, or others.
3. Chart the development of this factor along a time line through the ten-week period.

Data and Observations

Analysis

1. **Analyze** the time line you created. Identify developmental milestones related to this factor during the ten-week period.

_____

_____

_____

2. **Summarize** the level of development of the factor you examined by the end of Stage 23.

_____

_____

Name _____ Date _____ Class _____

BioLab

CHAPTER 36

Internet: How are ultrasound images used to track fetal development?

Background: Ultrasound is a medical imaging technique that uses high frequency sound waves and their echoes to produce an image of something inside the body. While two-dimensional images are the current standard, technology capable of producing three-dimensional fetal images and four-dimensional, or moving, images is now available.

Question: *How are ultrasound images used to assess fetal characteristics and development?*

Materials

computer with internet access
labeled ultrasound images showing embryos and fetuses at various developmental stages
ultrasound images showing embryos and fetuses at unknown stages of development

Procedure

1. Read and complete the lab safety form.
2. Visit biologygmh.com to examine fetal development from the second trimester through week 40. Use this information to complete the time line you started in **MiniLab** *Sequence Early Human Development.*
3. Study the ultrasound images of fetuses during identified stages of development provided by your teacher. Compare these to your time line, and identify as many features as possible. As you study the images, choose a body structure that you would like to examine further.
4. Study the ultrasound images provided by your teacher of fetuses at an unknown stage of development. Use your time line and what you have learned to determine the approximate stage of fetal development. Look for clues based on development of the system you choose.

Data and Observations

Analyze and Conclude

1. **Interpret Data** During which time period does the developing embryo or fetus change the most? Justify your answer.

2. **Analyze** What physical characteristics were most helpful in identifying the level of fetal development? Explain.

3. **Compare** two- and three-dimensional ultrasound images. Which are easiest to interpret?

4. **Think Critically** What advantages are provided by four-dimensional imaging?

5. **Error Analysis** How accurate were your estimates of fetal development? Explain how your estimates could have been improved.

Name _____ Date _____ Class _____

Real-World Biology: **Analysis**

CHAPTER 36

Premature Births

About 10 percent of babies born in the United States are born prematurely, or before they are fully developed. The cause of a premature birth is unknown in about half the cases. Some factors that are known to contribute to premature labor and birth are the early rupture of the amniotic sac, certain infections, abnormalities in the uterus, and fetal defects. Chronic diseases in the mother, such as high blood pressure and diabetes, can also be factors. Smoking, using alcohol and other drugs, and not eating a balanced diet are easily preventable factors that contribute to premature births.

The fetus in **Figure 1** has all its major organs, but it still needs to develop and grow in its mother's uterus, receiving oxygen and nutrients through the placenta. If the fetus were born now, it would not survive. In about eight more weeks, it might have a chance of survival with medical intervention. In this activity, you will investigate the problems premature babies face and their chances of survival.

Chances of Survival

Many factors affect a premature baby's chances of survival. One of the most important factors is gestational age, the fetus's age at the time of birth. **Table 1** shows survival rates at different gestational ages. These rates are based on babies who are born alive and who receive medical care. Other factors that affect the survival of premature babies are the baby's weight, breathing problems, abnormal development, and diseases such as respiratory and lung infections.

Premature babies that survive have an increased risk for blindness, lung diseases, learning disabilities, and developmental disabilities. Sometimes disabilities do not appear until the child goes to school. However, any premature baby might defy the odds and survive without long-term health problems.

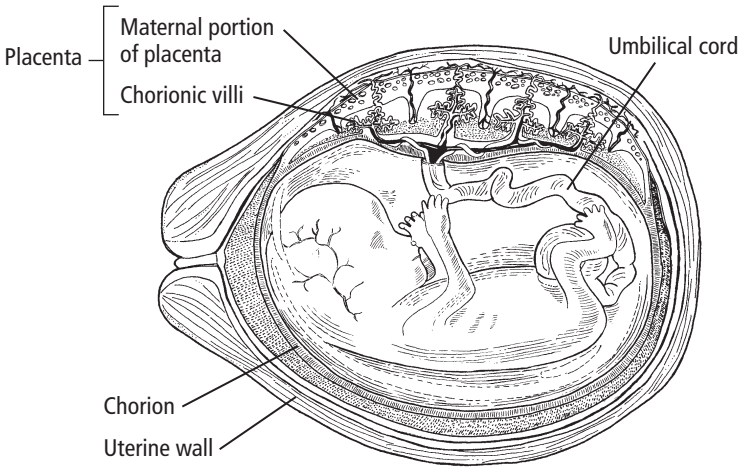


Figure 1 14-week fetus

Table 1

Gestational Age	Survival Rate
21 weeks or less	0%
22 weeks	0–10%
23 weeks	10–40%
24 weeks	40–70%
25 weeks	50–80%
26 weeks	80–90%
27 weeks	greater than 90%
30 weeks	greater than 95%
34 weeks	greater than 98%

Analyze and Conclude

Respond to each question and statement.

1. **Identify** What are the risks that premature babies face?

2. **Calculate** the approximate number of premature babies born out of every ten babies born in the United States.

3. **Predict** what medical treatment premature babies might need, based on a baby's growth and development in the uterus.

4. **Suggest** what a woman can do to try to prevent a premature birth, based on what you know about factors that contribute to premature births.

5. **Interpret** During which weeks do a baby's chances of survival increase at the greatest rate?

CAREERS IN BIOLOGY

Neonatal Nursing Visit biologygmh.com for information on neonatal nurses. What are the responsibilities of a neonatal nurse?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 36

Group Project: Investigating Hormone Therapy

Hormones secreted by the pituitary gland and the male and female reproductive organs control and regulate human reproduction and development. Imbalances of some hormones can cause major physiological changes, especially in women after their childbearing years. Hormone therapy is the administering of hormones or drugs to rectify hormonal imbalances. Hormone therapy for women has focused on relieving the symptoms of menopause. For men, hormone therapy is used mainly for treatment of prostate cancer.

Select Work in a small group and select one of the hormone therapies listed in the table to research in depth. Groups might concentrate on either the beneficial effects or negative side effects of male or female hormone treatments.

Research Once you have selected a hormone therapy for detailed study, use your textbook and other reference materials to find information on the topic. Your research should include information about current research regarding the therapy, individuals who should and should not consider undergoing the therapy, and any uncertainties involved in the therapy. Also, include background information on where the hormone is secreted in the body and its normal function.

Present Finally, present the information that you learned about the hormone therapy to your class. As other groups give their presentations, make a list of questions you have on the information presented. After all the groups have given their presentations, discuss everyone's questions.

Hormones/Drugs	Beneficial Effects of Therapy	Side Effects of Therapy
Estrogen	• relieves symptoms of menopause (including hot flashes and sleeping difficulty) • reduces osteoporosis • possible decrease in coronary heart disease*	• fluid retention • headaches, including migraines • breast tenderness • irritability • monthly bleeding • potential increase in breast cancer and uterine cancer* • increased risk of gallbladder disease
Progesterone		
Estrogen plus progesterone		
Various drugs to decrease testosterone levels	• treatment for prostate cancer	• decrease in bone density • hot flashes • anemia • erectile dysfunction

*Ongoing research has not yet established a clear and undisputed link.

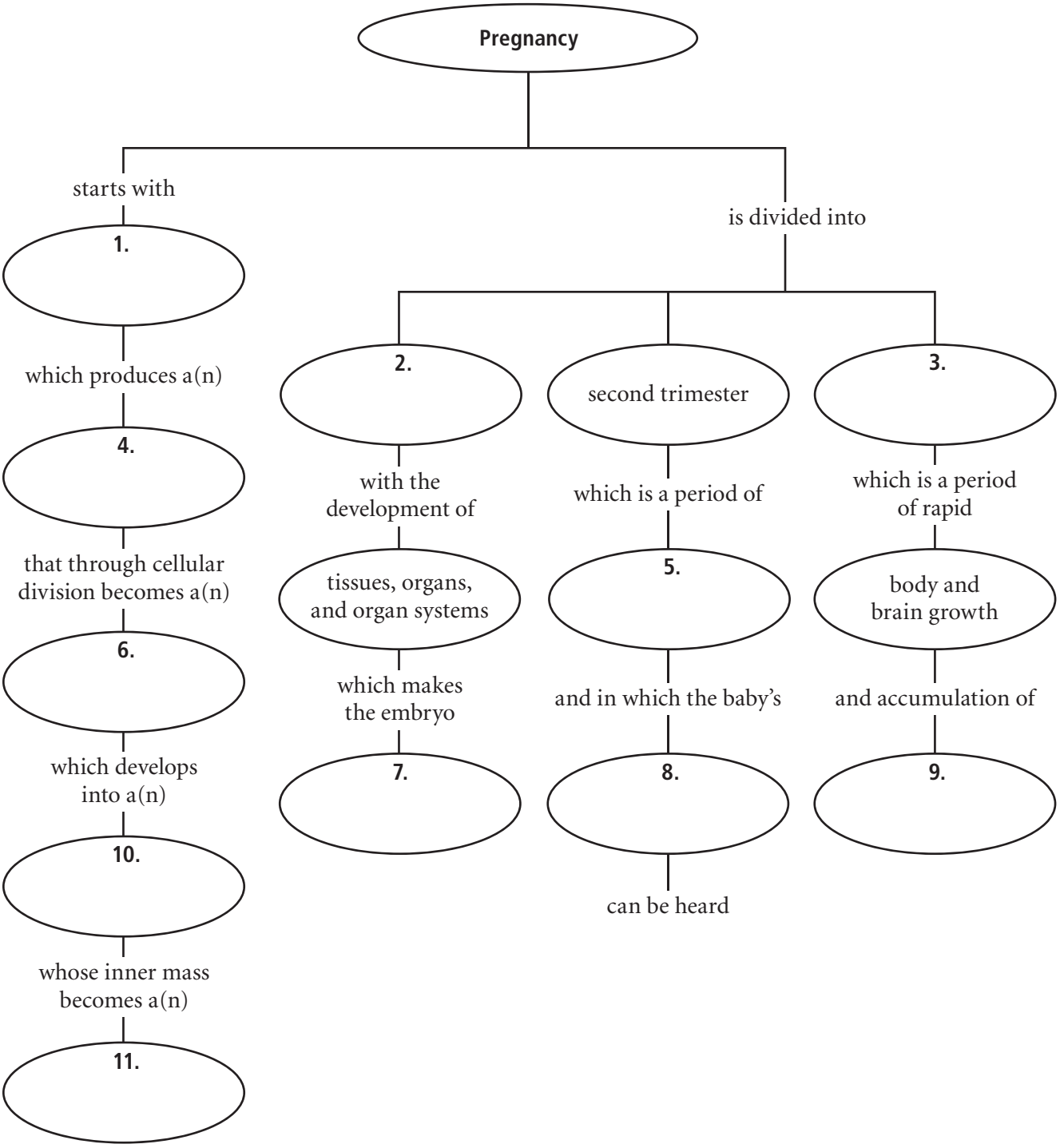
Name _____ Date _____ Class _____

Concept Mapping

CHAPTER 36

Pregnancy

Complete the flowchart about pregnancy. These terms may be used more than once: blastocyst, embryo, fat, fertilization, first trimester, growth, heartbeat, morula, third trimester, vulnerable, zygote.



Name _____ Date _____ Class _____

Study Guide

CHAPTER 36

Section 1: Reproductive Systems

In your textbook, read about the human male reproductive system.

If the statement is true, write true. *If the statement is false, replace the italicized word or phrase to make it true.*

1. The male hormone responsible for male secondary characteristics is *estrogen.*

_____

2. In the testes, sperm cells are produced in the *seminiferous tubules.*

_____

3. The temperature of the testes is *higher* than the internal temperature of the male body.

_____

4. *Follicle-stimulating hormone* stimulates the production and secretion of testosterone.

_____

5. The secondary sex characteristics appear at *puberty.*

_____

Use each of the terms below only once to complete the passage.

epididymis **semen** **urethra** **vas deferens**

Newly formed sperm cells pass through the seminiferous tubules to the **(6)** _____ . There the sperm mature and are stored. When the mature sperm are released, they travel through the **(7)** _____ , which is a duct leading away from the testis. Sperm travel along this duct and into the **(8)** _____ . This tube carries both **(9)** _____ and urine out of the body through the penis.

Complete the table by writing in the name of the steroid for each description. Use these choices:

Follicle-stimulating hormone (FSH) **Gonadotropin-releasing hormone (GnRH)**
Luteinizing hormone (LH) **Testosterone**

Steroid	Description
10.	increases the production of follicle-stimulating hormone and luteinizing hormone
11.	promotes the production of sperm cells in the testes
12.	influences the development of male secondary sex characteristics
13.	stimulates the production and secretion of testosterone in the testes

In your textbook, read about the human female reproductive system and the menstrual cycle.

Match the definition in Column A with the term in Column B.

	Column A	Column B
_____	**14.** tube that connects the ovary to the uterus	**A.** oocyte
_____	**15.** first phase of the menstrual cycle	**B.** luteal phase
_____	**16.** the smaller of the two structures resulting from the first meiotic division in the female	**C.** oviduct
_____	**17.** female sex cell	**D.** flow phase
_____	**18.** third phase of the menstrual cycle	**E.** polar body
_____	**19.** occurs when the follicle ruptures and an oocyte is released into an oviduct	**F.** ovulation
_____	**20.** second phase of the menstrual cycle	**G.** follicular phase

Complete the table by checking the correct column(s) for each event.

Event	Phase of Menstrual Cycle		
	Flow	Follicular	Luteal
21. The corpus luteum develops from a ruptured follicle.			
22. Estrogen levels are at their peak.			
23. Progesterone levels are at their peak.			
24. The uterine lining is shed.			
25. The LH level rises abruptly.			
26. Ovulation occurs.			
27. The uterine lining becomes engorged with blood, fat, and tissue fluid.			
28. The FSH level begins to rise.			

Name _____ Date _____ Class _____

Study Guide

CHAPTER 36

Section 2: Human Development Before Birth

In your textbook, read about fertilization.

Label the diagram. Use these choices:

fertilization	**implantation**	**ovary**	**oviduct**
ovulation	**uterus**	**vagina**	**zygote**

1. _____

2. _____

3. _____

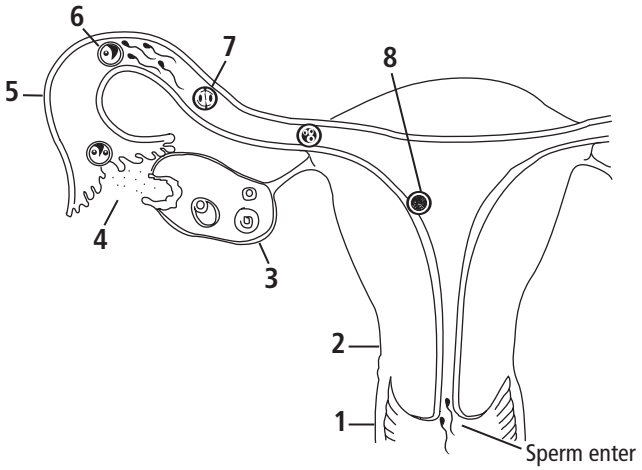
4. _____

5. _____

6. _____

7. _____

8. _____



In your textbook, read about the placenta.

Read each of the following terms. If it describes a substance that can cross the placenta, write yes. *If not, write* no.

_____ **9.** oxygen _____ **11.** alcohol _____ **13.** drugs _____ **15.** blood cells

_____ **10.** antibodies _____ **12.** nutrients _____ **14.** waste _____ **16.** carbon dioxide

In your textbook, read about the three trimesters of development.

Complete the table by checking the correct column(s) for each event.

Event	Trimester		
	First	Second	Third
17. Fetus can survive outside the uterus with medical assistance at the end of this trimester.			
18. Fetus undergoes rapid brain development.			
19. Embryo is most vulnerable to outside influences.			
20. Embryo becomes a fetus.			
21. Fetus can move its arms, fingers, and toes and make facial expressions.			
22. Fetus can respond to sounds in the environment.			
23. Fetus can suck its thumb and hiccup.			

Name _____ Date _____ Class _____

Study Guide

CHAPTER 36

Section 3: Birth, Growth, and Aging

In your textbook, read about birth.

Complete the table by writing in the stage of birth for each description. Use these choices:

dilation **expulsion** **placental**

Description	Stage of Birth
1. The placenta detaches from the uterus.	
2. The umbilical cord is clamped and cut.	
3. Contractions of the uterus become stronger and the amniotic sac tears.	
4. The placenta and extraembryonic membranes leave the mother's body.	
5. The cervix opens to allow the baby to leave the uterus.	
6. The mother contracts her abdominal muscles to help push the baby through the vagina.	

In your textbook, read about growth and aging.

For each answer below, write an appropriate question.

7. Answer: It is the stage of life that begins when physical growth is complete.

Question: _____

8. Answer: It is the stage of life when a person typically learns to walk.

Question: _____

9. Answer: It is the stage of life between childhood and adulthood.

Question: _____

10. Answer: It is the stage of life between infancy and adolescence.

Question: _____

Use each of the terms below only once to complete the passage:

8 and 13 **10 and 15** **adolescence** **adulthood** **childhood**
child's **infancy** **menopause** **two**

The first (**11**) _____ years of life are known as (**12**) _____ .
A(n) (**13**) _____ ability to reason and solve problems develops progressively during (**14**) _____ . In girls, puberty usually begins between ages (**15**) _____ during (**16**) _____ . In boys, puberty usually begins between ages (**17**) _____ . In women, the ability to have children ends at (**18**) _____ during late (**19**) _____ .

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 36
Sección 1: Sistemas reproductivos

En tu libro de texto, lee acerca del sistema masculino de reproducción humana.

Si la afirmación es verdadera, escribe «verdadero». Si la afirmación es falsa, sustituye la palabra o frase en cursiva para volverla verdadera.

1. La hormona masculina responsable de las características masculinas secundarias es *el estrógeno.*

_____

2. En los testículos, las células de esperma se producen en *los túbulos seminíferos.*

_____

3. La temperatura de los testículos es *mayor* que la temperatura interna del cuerpo masculino.

_____

4. *La hormona estimulante de folículos* estimula la producción y secreción de testosterona.

_____

5. Las características sexuales secundarias aparecen en *la pubertad.*

_____

Usa cada uno de los siguientes términos sólo una vez para completar el párrafo.

conducto deferente **epidídimo** **semen** **uretra**

El esperma pasa a través de los túbulos seminíferos hacia el (**6**) _____ , donde el esperma madura y se almacena. Cuando el esperma se libera, se desplaza a través del (**7**) _____ , el cual es un conducto que se aleja de los testículos. El esperma se desplaza por este conducto a la (**8**) _____ . Este tubo transporta tanto el (**9**) _____ como la orina hacia fuera del cuerpo a través del pene.

Completa la tabla con el nombre del esteroide para cada descripción. Usa estas opciones:

Hormona estimulante de folículos (FSH) **Hormona liberadora de gonadotropina (GnRH)**
Hormona luteinizante (LH) **Testosterona**

Esteroide	Descripción
10.	Aumenta la producción de la FSH y la LH.
11.	Promueve la producción de células de esperma en los testículos.
12.	Influencia el desarrollo de las características sexuales secundarias.
13.	Estimula la producción de la testosterona.

En tu libro de texto, lee acerca del sistema femenino de reproducción humana y del ciclo menstrual.

Relaciona la definición de la columna A con el término de la columna B.

	Columna A	Columna B
_____	**14.** tubo que conecta el ovario con el útero	**A.** oocito
_____	**15.** primera fase del ciclo menstrual	**B.** fase lútea
_____	**16.** la más pequeña de las dos estructuras que resultan de la primera división meiótica en la mujer	**C.** oviducto
_____	**17.** célula sexual femenina	**D.** fase del flujo
_____	**18.** tercera fase del ciclo menstrual	**E.** cuerpo polar
_____	**19.** ocurre cuando el folículo se rompe y se libera un oocito dentro de un oviducto	**F.** ovulación
_____	**20.** segunda fase del ciclo menstrual	**G.** fase folicular

Completa la tabla marcando la(s) columna(s) correcta(s) para cada evento.

Evento	Fase del ciclo menstrual		
	Flujo	Folicular	Lútea
21. El cuerpo lúteo se desarrolla a partir de un folículo roto.			
22. Los niveles de estrógeno están en su nivel máximo.			
23. Los niveles de progesterona están en su nivel máximo.			
24. Se arroja el revestimiento uterino.			
25. El nivel de la hormona luteinizante (LH) aumenta abruptamente.			
26. Ocurre la ovulación.			
27. El revestimiento uterino se llena de sangre, grasa y fluido del tejido.			
28. El nivel de la hormona estimulante de folículos (FSH) empieza a subir.			

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 36

Sección 2: Desarrollo humano antes del nacimiento

En tu libro de texto, lee acerca de la fertilización.

Identifica el diagrama. Usa estas opciones:

cigoto	**fertilización**	**implantación**	**ovario**
oviducto	**ovulación**	**útero**	**vagina**

1. _____

2. _____

3. _____

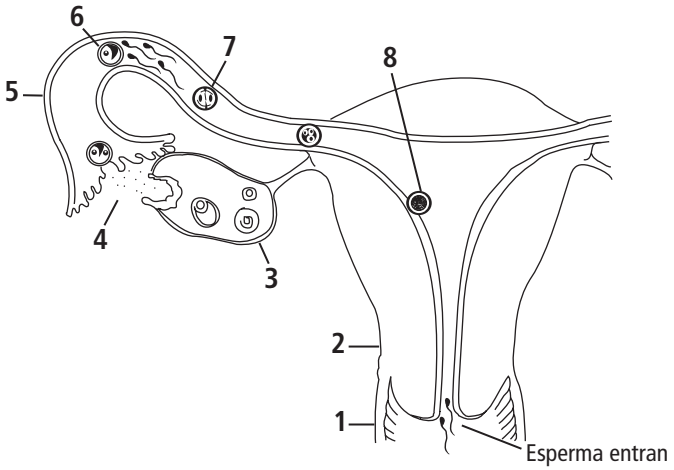
4. _____

5. _____

6. _____

7. _____

8. _____



En tu libro de texto, lee acerca de la placenta.

Lee cada uno de los siguientes términos. Si describe una sustancia que puede atravesar la placenta, escribe «sí». De lo contrario, escribe «no».

_____ **9.** oxígeno _____ **11.** alcohol _____ **13.** drogas _____ **15.** células sanguíneas

_____ **10.** anticuerpos _____ **12.** nutrientes _____ **14.** desechos _____ **16.** dióxido de carbono

En tu libro de texto, lee acerca de los tres trimestres de desarrollo.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada evento.

Evento	Trimestre		
	Primero	Segundo	Tercero
17. El feto puede sobrevivir por fuera del útero con asistencia médica al final de este trimestre.			
18. El feto pasa por un rápido desarrollo del cerebro.			
19. El embrión es más vulnerable a influencias externas.			
20. El embrión se convierte en feto.			
21. El feto puede mover los brazos, dedos y hacer expresiones faciales.			
22. El feto puede responder a los sonidos en el ambiente.			
23. El feto puede chuparse el dedo y tener hipo.			

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 36

Sección 3: Nacimiento, crecimiento y envejecimiento

En tu libro de texto, lee acerca del nacimiento.

Completa la tabla con la etapa del nacimiento para cada descripción. Usa estas opciones:

dilatación **expulsión** **placentaria**

Descripción	Etapa del nacimiento
1. La placenta se desprende del útero.	
2. El cordón umbilical se ata y se corta.	
3. Las contracciones se vuelven más fuertes y el saco amniótico se rompe.	
4. La placenta y las membranas extraembriónicas salen del cuerpo de la madre.	
5. La cerviz se abre para permitir que el bebé salga del útero.	
6. La madre contrae los abdominales para empujar al bebé a través de la vagina.	

En tu libro de texto, lee acerca del crecimiento y el envejecimiento.

Para cada respuesta a continuación, escribe una pregunta adecuada.

7. Respuesta: Es la etapa de la vida que empieza cuando el crecimiento físico está completo.

Pregunta: _____

8. Respuesta: Es la etapa de la vida cuando una persona por lo general aprende a caminar.

Pregunta: _____

9. Respuesta: Es la etapa de la vida entre la niñez y la adultez.

Pregunta: _____

10. Respuesta: Es la etapa de la vida entre la infancia y la adolescencia.

Pregunta: _____

Usa cada uno de los siguientes términos sólo una vez para completar el párrafo.

8 y 13 **10 y 15** **adolescencia** **adultez** **dos**
infancia **menopausia** **niñez** **niño**

Los primeros **(11)** _____ años de vida se llaman la **(12)** _____ . La capacidad de un **(13)** _____ para razonar se desarrolla durante la **(14)** _____ . En las niñas, la pubertad empieza entre las edades de **(15)** _____ durante la **(16)** _____ . En los niños, la pubertad empieza entre las edades de **(17)** _____ . Las mujeres terminan de poder tener hijos en la **(18)** _____ durante la **(19)** _____ tardía.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 36

Section 1: Reproductive Systems

After reading the section in your textbook, respond to each statement.

1. **Explain** why the scrotal pouch is located outside the body.

2. **Define** *testosterone*. **Identify** where it is produced.

3. **Describe** how hormone levels change during the follicular phase of the menstrual cycle. Use the terms *estrogen*, *follicles*, *FSH*, *LH*, *negative feedback*, and *progesterone* in your answer.

4. **Compare** the frequency of production of sperm in human males to the frequency of production of eggs in human females.

5. **Theorize** whether there will be a flow phase of the menstrual cycle if pregnancy occurs. Explain. Use the terms *embryo* and *endometrium* in your answer.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 36

Section 2: Human Development Before Birth

After reading the section in your textbook, respond to each statement.

1. **State** the purpose of amniotic fluid.

2. **Summarize** how the levels of hormones change and affect the levels of other hormones during pregnancy.

3. **Indicate** why a fetus is more vulnerable to effects of alcohol, tobacco, drugs, and other environmental influences during the first trimester than other trimesters.

4. **Theorize** why ultrasound would be used first to diagnose fetal conditions before amniocentesis or chorionic villi sampling.

5. **Infer** why it takes several hundred sperm for only one sperm to fertilize a human egg.

Name _____ Date _____ Class _____

Section
Quick Check

CHAPTER 36

Section 3: Birth, Growth, and Aging

After reading the section in your textbook, respond to each statement.

1. **Cite** seven signs of aging.

2. **Explain** the physical and chemical processes that occur in the mother as the birthing process begins.

3. **Describe** the kinds of changes and developments that occur during adolescence.

4. **Compare** how the reproductive capability of women and men changes as they age in adulthood.

5. **Assess** why contractions are stronger during the expulsion stage of birth than during the dilation stage.

Name _____ Date _____ Class _____

CHAPTER 36
Assessment Student Recording Sheet

Section 36.1

Vocabulary Review

Write sentences to compare and contrast each pair of terms.

1. _____

_____

2. _____

_____

3. _____

_____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ **5.** Ⓐ Ⓑ Ⓒ Ⓓ **6.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

7. _____

_____

8. _____

_____

_____

9. _____

_____

Think Critically

10. _____

_____

11. _____

_____

Section 36.2

Vocabulary Review

Write a sentence defining each vocabulary term.

12. _____

_____

Name _____ Date _____ Class _____

CHAPTER 36
Assessment
Student Recording Sheet

13. _____

14. _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

15. Ⓐ Ⓑ Ⓒ Ⓓ
16. Ⓐ Ⓑ Ⓒ Ⓓ
17. Ⓐ Ⓑ Ⓒ Ⓓ
18. Ⓐ Ⓑ Ⓒ Ⓓ
19. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

20. _____

21. **Careers in Biology** _____

22. _____

Think Critically

23. _____

24. _____

Section 36.3

Vocabulary Review

Write sentences to compare and contrast each pair of terms.

25. _____

26. _____

Name _____ Date _____ Class _____

CHAPTER 36
Assessment
Student Recording Sheet

27. _____

_____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

28. Ⓐ Ⓑ Ⓒ Ⓓ **30.** Ⓐ Ⓑ Ⓒ Ⓓ **32.** Ⓐ Ⓑ Ⓒ Ⓓ

29. Ⓐ Ⓑ Ⓒ Ⓓ **31.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

33. _____

_____

_____

34. _____

_____

_____

35. Careers in Biology Record your answers for question 35 on a separate sheet of paper.

Think Critically

36. _____

Additional Assessment

37. Writing in Biology Record your answer for question 37 on a separate sheet of paper.

Document-Based Questions

38. Record your answer for question 38 on a separate sheet of paper.

39. _____

_____

Cumulative Review

40. _____

_____

_____

41. _____

_____

_____

Name _____ Date _____ Class _____

CHAPTER 36

Assessment Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ **4.** Ⓐ Ⓑ Ⓒ Ⓓ **7.** Ⓐ Ⓑ Ⓒ Ⓓ

2. Ⓐ Ⓑ Ⓒ Ⓓ **5.** Ⓐ Ⓑ Ⓒ Ⓓ **8.** Ⓐ Ⓑ Ⓒ Ⓓ

3. Ⓐ Ⓑ Ⓒ Ⓓ **6.** Ⓐ Ⓑ Ⓒ Ⓓ **9.** Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

10. _____

_____

11. _____

_____

12. Record your answer for question 12 on a separate sheet of paper.

13. _____

_____

14. Record your answer for question 14 on a separate sheet of paper.

15. _____

_____

16. _____

_____

Extended Response

Answer each question with complete sentences.

17. Record your answer for question 17 on a separate sheet of paper.

18. _____

_____

19. _____

_____

_____

Essay Question

20. Record your answer for question 20 on a separate sheet of paper.

Table of Contents

Reproducible Pages

Chapter 37 Immune System

Name _____ Date _____ Class _____

Diagnostic Test

CHAPTER 37
The Immune System

Before reading Chapter 37, predict answers to questions about the chapter content based on what you already know. Circle the letter of the correct answer, and then explain your reasoning.

1. Isabel is feeling ill and visits a doctor for a diagnosis of her illness. The doctor evaluates her condition before talking with Isabel about her condition and possible treatment options. Which would be a statement made by the doctor?

A. You are infected by bacteria causing the degenerative Lyme disease.

B. You contracted asthma, a genetic disease you inherited from a parent.

C. You have a common cold virus, an infectious disease that I cannot treat with drugs.

D. You have the flu virus, a noninfectious disease I will treat with antibiotics.

Explain.

_____

_____

_____

2. Michael is concerned about contracting colds, the flu, and other diseases during the winter months. He decides to research the basic defenses of his body's immune system so he can decide how best to help his immune system fight off disease-causing microorganisms. Which fact will he find during his research?

A. Bone marrow can produce special red blood cells to fight off infections.

B. Tears contain dilute hydrochloric acid to kill bacteria and viruses in the eyes.

C. The body's skin is the first barrier against the invasion of microorganisms.

D. The lymphatic system uses chemicals to kill microorganisms in the blood.

Explain.

_____

_____

_____

3. A new and deadly virus has emerged in the country of Austria. The virus displays flu-like symptoms at first, but it quickly invades the body's immune system and causes a failure of the system. What should medical researchers do to combat this new disease?

_____

_____

_____

Name _____ Date _____ Class _____

Launch Lab

CHAPTER 37

How do you track a cold?

Colds and many other illnesses are caused by pathogens that can pass from person to person. In this lab, you will trace the path of a cold.

Procedure

1. Read and complete the lab safety form.
2. Create a series of questions you can ask your classmates about the last time they had a cold: their symptoms, other family members and friends who had the same symptoms, and the hygiene precautions they used to avoid illnesses.
3. Interview your classmates using your list.
4. In the space below, design a concept map that organizes the data you have collected to trace the paths the colds in your classmates took as they passed from person to person.

Data and Observations

Analysis

1. **Describe** how your concept map distinguishes between different cold symptoms present in your classmates.

_____

_____

_____

2. **Infer** what paths the different colds might have taken as they passed from person to person among your classmates and their friends and family.

_____

_____

_____

Name _____ Date _____ Class _____

MiniLab

CHAPTER 37

Evaluate the Spread of Pathogens

How can you evaluate the spread of disease? Investigate what possible diseases might be transmitted by common items.

Procedure

1. Read and complete the lab safety form.
2. Observe all the items given to you by your teacher.
3. Infer the types of diseases each item could pass on to a human (if any).
4. Evaluate the likelihood of each item transmitting a disease to a human, and devise a scale for assessing each item's probability for transmitting an infectious disease. Use a separate sheet of paper.

Analysis

1. **Identify** the types of pathogens that might be transmitted by the items you were given and the methods of transmission of each pathogen.

2. **Infer** the items most likely to be disease reservoirs.

3. **Describe** possible disease patterns of each pathogen.

4. **Infer** how you could prevent getting diseases from these possible pathogens.

Name _____ Date _____ Class _____

MiniLab

CHAPTER 37

Compare Cancerous and Healthy Cells

How do cancerous cells and healthy cells differ in appearance? Observe and compare liver cells afflicted with this common noninfectious disease to healthy liver cells.

Procedure

1. Read and complete the lab safety form.
2. Place a prepared **slide of healthy human liver cells** on a **microscope.**

WARNING: ***Never touch broken microscope slides or other broken glass materials.***

3. Observe the healthy liver cells under several different magnifications.
4. In the space below, sketch a diagram of several healthy liver cells.
5. Repeat steps 2–4 with a prepared **slide of cancerous human liver cells**.

Data and Observations

Analysis

1. **Compare** and **contrast** the features of healthy liver cells with those of cancerous liver cells.

2. **Infer** why it would not be dangerous to handle an object that was handled by a patient with liver cancer.

3. **Describe** how cancer disrupts the body's homeostasis.

Name _____ Date _____ Class _____

BioLab

CHAPTER 37

Forensics: How do you find Patient Zero?

Background: Imagine that a new disease—"cellphonitis"—has invaded your school. One of the symptoms of this disease is the urge to use a cell phone during class. "Cellphonitis" is easily transferred from person to person by direct contact and there is no natural immunity to the disease. A student in your class has the disease, and is Patient Zero. The disease is spreading in your class and you need to track the disease to prevent the spread of an epidemic.

Question: *Is it possible to track a disease and determine the identity of Patient Zero?*

Materials

Pasteur pipets (1 per group)
numbered test tubes of water, one infected with simulated "cellphonitis" (1 per group)
test tube racks (1 per group)
small paper cups (1 per group)
pencil and paper
testing indicator

Safety Precautions

Procedure

1. Read and complete the lab safety form.
2. Prepare a table to keep track of the contacts you make. Select a test tube and record the number of the test tube.
3. Use a Pasteur pipet and move a small amount of the fluid from the test tube to a paper cup.
4. Your teacher will divide your class into groups. When your group is called, you will simulate the sharing of saliva during drinking the water by using your pipets to exchange the fluid in your tubes with another member of your group.
5. Record who you exchanged with in your tables.
6. Roll the tube gently between your hands to mix and repeat step 4 every time your group is told to exchange. Be sure to pick someone different to exchange with each time.
7. When the exchanges are complete, your teacher will act as the epidemiologist and use the testing indicator to see who has the disease.
8. Share the information and work together as groups to see if you can determine the identity of Patient Zero.
9. Once each group has made their hypothesis, test the original fluid in each cup to see who really was Patient Zero.
10. Return the test tubes. Dispose of the other materials you used as instructed by your teacher.

Analyze and Conclude

1. **Analyze** Use your data and draw a diagram in the space below for each possible Patient Zero. Use arrows to show who should be infected with each possible Patient Zero.

2. **Compare and Contrast** How was the spread of "cellphonitis" in this simulation similar to the spread of disease in real life? How was it different?

3. **Think Critically** If this simulation were run in a large class, why might the disease not be passed in later exchanges?

4. **Error Analysis** What problems did you run into as you tried to determine Patient Zero?

Name _____ Date _____ Class _____

Real-World Biology: **Analysis**

CHAPTER 37

Histamine Gone Wild

Two sudden deaths on a summer afternoon in the Sunny Acres section of Middletown had the neighborhood in an uproar. Amad Davis, a young man who had been eating lunch, was found dead in the kitchen of his home. Ofelia Ruiz, a healthy middle-aged woman who had been gardening in the side yard of her house, was found dead by the mail carrier.

What happened? Was there a serial killer on the loose? There was no evidence of an invader at either of the homes, so what could have killed two healthy people suddenly? Fears of a serial killer died down when the medical examiner reported that the throat of each victim was swollen shut. Such throat swelling is a symptom of a severe allergic reaction called *anaphylactic shock,* which also includes loss of consciousness due to dangerously low blood pressure. Anaphylactic shock occurs when cells release a massive amount of the chemical histamine in response to an allergen.

Part A: Histamine Release

Histamine release is the result of a localized inflammatory response to an allergen. **Figure 1** shows the difference between the primary and secondary response to exposure to an allergen. When a person is exposed to an allergen, his or her B cells become activated, as shown in **Figure 1.** The activated B cells produce antibodies that cause histamine to be released.

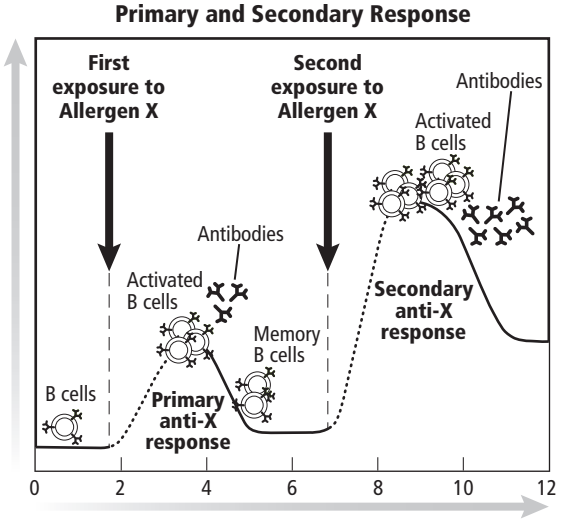


Figure 1

Analyze and Conclude

*Use **Figure 1** to respond to each statement.*

1. **Explain** why some allergens might not cause an allergic reaction at the time of first exposure to the allergens.

_____

_____

2. **Predict** after which exposure the massive release of histamine would probably occur. Explain.

_____

_____

Part B: Anaphylactic Shock

During anaphylactic shock, the immune system identifies a substance to which a person is hypersensitive and then launches a fierce attack on it with histamine. Death can then occur within three to four minutes of exposure to the allergen.

Substances that can trigger anaphylactic shock include prescription medication, venom of stinging insects, foods, blood or blood products that are transfused, and latex.

Neighbors were not aware of any allergies suffered by Amad or Ofelia, so investigators began to look for evidence at the locations of the deaths.

Analyze and Conclude

Respond to each statement.

1. **Explain** "triggers" investigators might look for at Amad's and Ofelia's homes.

   a. Amad's home _____

   b. Ofelia's home _____

Table 1

Allergen	Description
Dust mites	Mites are found in mattresses, pillows, and carpets. Mite feces and the mites themselves are allergens.
Plant pollen	People can react to one or more pollens. Different parts of the country have different pollen seasons. A person's pollen allergy season can be from early spring to late fall.
Animal dander	Dander is skin flakes. Cat and dog allergies are most common, but people are also allergic to other pets such as birds, hamsters, rabbits, mice, and gerbils.
Peanuts	Certain proteins in peanuts are allergens. Peanut allergy is responsible for more fatalities than any other type of allergy.
Latex	Latex comes from the milky sap of the rubber tree found in Africa and Southeast Asia. The exact cause of latex allergy is unknown.
Bee venom	Bees release venom from glands attached to their stingers. The venom causes pain and swelling.

2. **Hypothesize** which of the common allergens described in **Table 1** were responsible for inducing anaphylactic shock in Amad and Ofelia. Explain.

   a. Amad _____

   b. Ofelia _____

3. **Infer** When the investigators looked inside Ofelia's house, they found an epinephrine kit, which is used to prevent anaphylactic shock. The kit contains a premeasured dose of epinephrine, ready to inject after exposure to an allergen. Circle the reaction you think epinephrine causes when injected into the body.

   A. kills pain
   B. lowers blood pressure and pulse rate
   C. relaxes muscles in the airways
   D. tranquilizes the person

4. **Indicate** what precautions Amad and Ofelia could have taken to prevent anaphylactic shock.

   a. Amad _____

   b. Ofelia _____

CAREERS IN BIOLOGY

Allergist Visit biologygmh.com for information on allergists. What are the responsibilities of an allergist?

Name _____ Date _____ Class _____

Enrichment

CHAPTER 37

Analyze a Problem: The Rise of Drug-Resistant Diseases

Natural selection is responsible for a growing problem—the rise of drug-resistant diseases. Bacteria, viruses, and other disease-causing microbes are rapidly evolving resistance to many drugs and antibiotics. Some organisms evolve so rapidly that they soon will become resistant to all of the currently available drugs. Consequently, new drugs and antibiotics must constantly be developed.

When antibiotics are not taken properly, not taken for the prescribed time, or taken unnecessarily, drug resistance increases. Another practice that has contributed to drug resistance is the addition of antibiotics or antimicrobials to animal feed. These drugs are passed on in low levels to humans through meat and milk.

Select The table lists some organisms that have varying degrees of drug resistance. Select one of the organisms to research.

Research Once you have selected an organism, research the disease(s) caused by the organism and the problem of the organism's drug resistance. Questions to consider include: What is the extent of the organism's drug resistance? What practices contributed to drug resistance? Why is the problem of drug resistance more serious in hospitals?

Discuss Use your textbook and other reference materials to find information. Discuss your topic and possible answers to your questions with your teacher and classmates.

Write Based on your research and class discussion, write an article about the drug-resistant organism you selected. Provide answers for any questions you researched and discussed. Be sure to cite accurately the sources you used to write your article.

Drug-Resistant Organisms

Organism	Disease(s)	Drug(s) Used to Treat the Disease(s)
Pneumococci	pneumonia	penicillin erythromycin cephalosporin
Gonococci	gonorrhea	penicillin fluoroquinolone
Enterococci	infections of wounds, blood, heart, intestines, urinary tract	vancomycin
Staphylococcus aureus	infections of wounds, skin, heart	penicillin vancomycin
Campylobacter	food-borne, gastrointestinal infections	fluoroquinolone

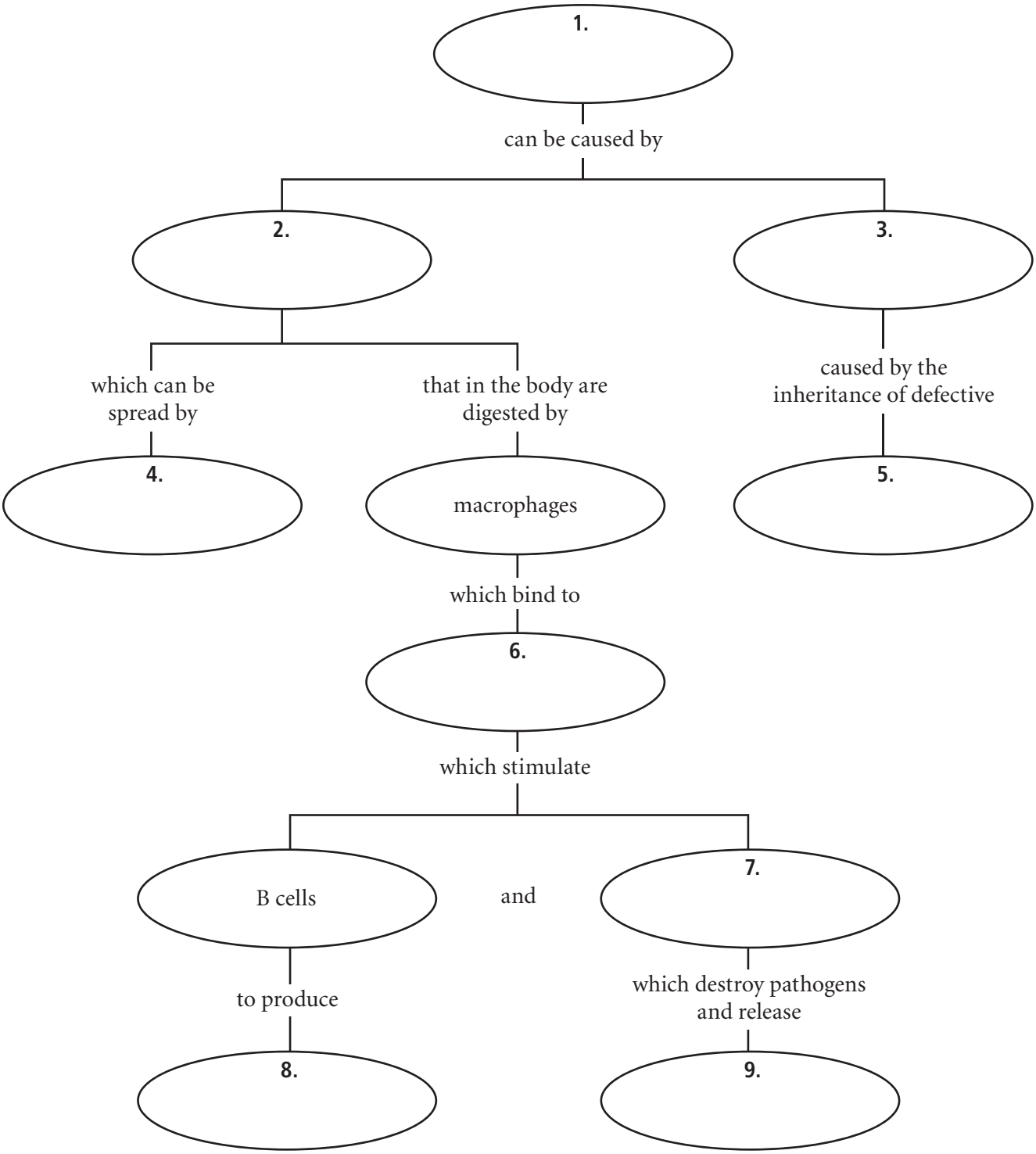
Name _____ Date _____ Class _____

Concept Mapping

CHAPTER 37

Disease

Complete the flowchart about disease. These terms may be used more than once: antibodies, carriers, cytokines, cytotoxic T cells, disease, genes, genetic disorders, helper T cells, pathogens.



Name _____ Date _____ Class _____

Study Guide

CHAPTER 37

Section 1: Infectious Diseases

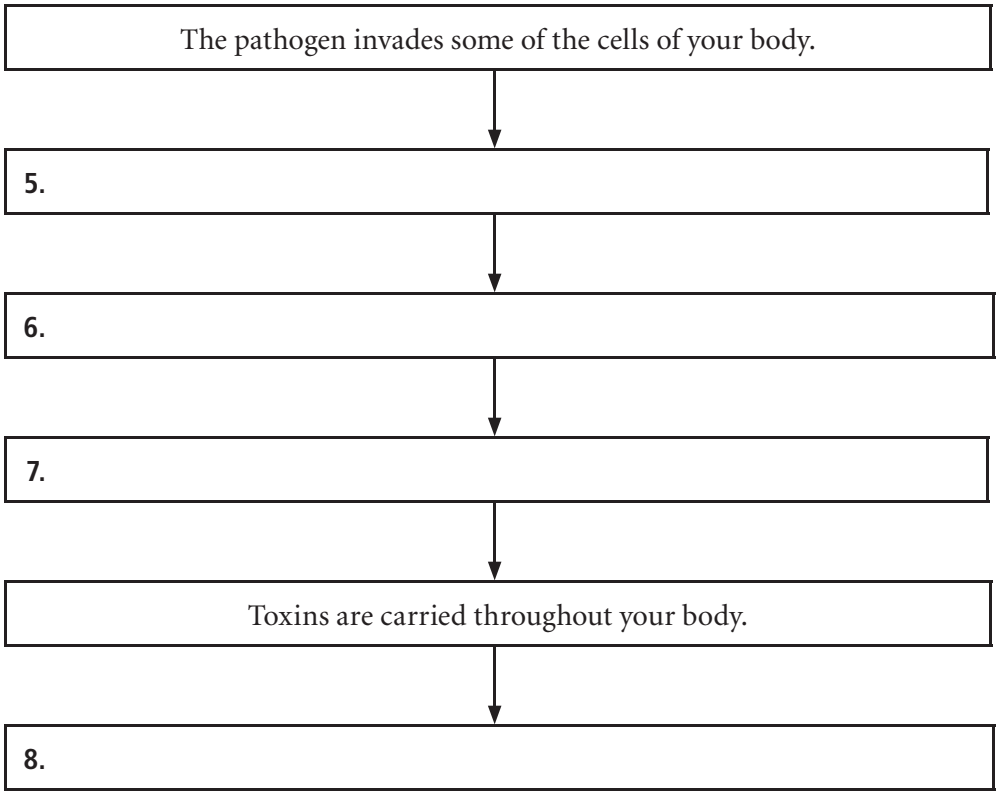
In your textbook, read about Koch's postulates.

Match the description of Koch's postulates in Column A with the step number in Column B.

	Column A	Column B
_____	**1.** The suspected pathogen that has been grown in a pure culture must cause a disease in a healthy host.	**A.** step 1
_____	**2.** The suspected pathogen must be grown in a pure culture with no other microorganisms present.	**B.** step 2
_____	**3.** The suspected pathogen must be identified from the diseased host.	**C.** step 3
_____	**4.** The suspected pathogen must be isolated from the new host, grown again in pure culture, and have the same characteristics as the original suspected pathogen.	**D.** step 4

In your textbook, read about the symptoms of disease.

Complete the graphic organizer about the steps of viral infection.



Name _____ Date _____ Class _____

Study Guide

CHAPTER 37

Section 2: The Immune System

In your textbook, read about specific immunity.

Complete the table by filling in the missing information.

Organ	Location	Function
Lymph nodes	along the course of the lymphatic vessels	**1.**
Tonsils	**2.**	**3.**
4.	**5.**	stores blood, destroys damaged cells, responds to foreign substances in the blood
Thymus	**6.**	**7.**

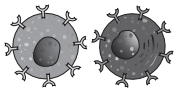
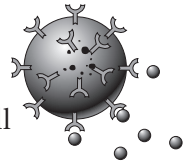
In your textbook, read about passive and active immunity.

Complete the table by checking the correct column(s) for each description.

Description	Passive Immunity	Active Immunity
8. Occurs when one organism receives antibodies from another organism		
9. Occurs as a result of having a disease		
10. Occurs after the body has been exposed to a pathogen		
11. Occurs when antibodies are injected into the body		
12. Occurs when a mother passes antibodies to a fetus through the placenta		

In your textbook, read about B cell response, T cell response, and passive and active immunity.

Complete the table by filling in the missing information.

Type of Blood Cell or Structure	Function
B cells  Memory B cell	**13.**
T cells  Helper T cell Cytotoxic T cell Memory T cell	**14.**
Antibodies 	**15.**

In your textbook, read about immune system failure.

Use each of the terms below only once to complete the passage.

blood products **decreases** **RNA** **secondary infection** **sexual intercourse**

HIV is a(n) **(16)** _____ virus that infects helper T cells. Eventually, the number of helper T cells **(17)** _____ , and the person becomes susceptible to disease. The virus can be passed to another person through **(18)** _____ and **(19)** _____ . The infected person usually dies from a(n) **(20)** _____ .

Name _____ Date _____ Class _____

Study Guide

CHAPTER 37

Section 3: Noninfectious Disorders

In your textbook, read about cancer.

Imagine you are a fund-raiser campaigning to raise awareness of and funds for cancer research. In the space below, design a poster raising awareness about the need for cancer research. On your poster, include a brief definition of cancer, why cancer is so destructive to the body, where in the human body cancer can develop, and factors that contribute to cancer.

In your textbook, read about autoimmunity.

Complete the table by filling in the missing information.

Autoimmune Disease	Symptoms	Cause
1.	knobs or swelling of the joints	**2.**
Rheumatic fever	**3.**	**4.**
Lupus	**5.**	**6.**

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 37
Sección 1: Enfermedades infecciosas

En tu texto, lee acerca de los postulados de Koch.

Relaciona la descripción de los postulados de Koch en la columna A con el número de paso en la columna B.

	Columna A	Columna B
_____	**1.** El patógeno sospechoso que se ha cultivado en un cultivo puro debe causar enfermedad en un huésped sano.	**A.** paso 1
_____	**2.** El patógeno sospechoso debe crecer en un cultivo puro sin otros microorganismos presentes.	**B.** paso 2
_____	**3.** El patógeno sospechoso se debe identificar del huésped enfermo.	**C.** paso 3
_____	**4.** El patógeno sospechoso se debe aislar del huésped nuevo, cultivarse de nuevo en un cultivo puro, y tener las mismas características que el patógeno sospechoso original.	**D.** paso 4

En tu libro de texto, lee acerca de los síntomas de enfermedades.

Completa el organizador gráfico sobre los pasos de la infección viral.

El patógeno invade algunas de las células de tu cuerpo.

↓

5.

↓

6.

↓

7.

↓

Las toxinas se transportan por todo tu cuerpo.

↓

8.

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 37

Sección 2: El sistema inmunológico

En tu libro de texto, lee acerca de la inmunidad específica.

Completa la tabla con la información faltante.

Órgano	Ubicación	Función
Nudos linfáticos	a lo largo del trayecto de los vasos linfáticos	**1.**
Amígdalas	**2.**	**3.**
4.	**5.**	Almacena sangre, destruye las células dañadas y responde a sustancias extrañas en la sangre.
Timo	**6.**	**7.**

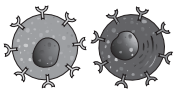
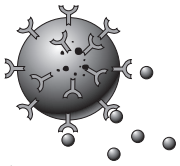
En tu libro de texto, lee acerca de la inmunidad pasiva y activa.

Completa la tabla marcando la(s) columna(s) correcta(s) para cada descripción.

Descripción	Inmunidad pasiva	Inmunidad activa
8. Ocurre cuando un organismo recibe anticuerpos de otro organismo.		
9. Ocurre como resultado de tener una enfermedad.		
10. Ocurre después de que el cuerpo se ha expuesto a un patógeno.		
11. Ocurre cuando se inyectan anticuerpos en el cuerpo.		
12. Ocurre cuando una madre transmite anticuerpos al feto a través de la placenta.		

En tu libro de texto, lee acerca de la respuesta celular B, la respuesta celular T y la inmunidad pasiva y activa.

Completa la tabla con la información faltante.

Tipo de célula o estructura sanguínea	Función
Células B  Célula de memoria B	**13.**
Células T  Células ayudantes T Células citotóxicas T Células de memoria T	**14.**
Anticuerpos 	**15.**

En tu libro de texto, lee acerca de la deficiencia del sistema inmunológico.

Usa cada uno de los términos a continuación una vez únicamente para completar el párrafo.

ácido ribonucleico (ARN)	**acto sexual**	**disminuciones**
infección secundaria	**productos sanguíneos**	

El VIH es un virus del **(16)** _____ que infecta las células ayudantes T. Finalmente, el número de células ayudantes T **(17)** _____ , y la persona se vuelve susceptible a las enfermedades. El virus se puede transmitir a otra persona a través de(l) **(18)** _____ y **(19)** de(l) _____ . La persona infectada por lo general muere a causa de una **(20)** _____ .

Nombre _____ Fecha _____ Curso _____

Guía de estudio

CAPÍTULO 37

Sección 3: Trastornos no infecciosos

En tu libro de texto, lee acerca del cáncer.

Imagina que estás adelantando una campaña para recoger fondos y crear conciencia para la investigación del cáncer. En el siguiente espacio, diseña un afiche para crear conciencia acerca de la necesidad de investigar acerca del cáncer. En tu afiche, incluye una definición breve del cáncer, porqué es tan destructor para el cuerpo, dónde se puede desarrollar en el cuerpo y los factores que pueden contribuir al cáncer.

En tu libro de texto, lee acerca de la autoinmunidad.

Completa la tabla con la información faltante.

Enfermedad autoinmunológica	Síntomas	Causa
1.	protuberancias o inflamación de las coyunturas	**2.**
Fiebre reumática	**3.**	**4.**
Lupus	**5.**	**6.**

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 37

Section 1: Infectious Diseases

After reading the section in your textbook, respond to each statement.

1. **Name** the three patterns that can occur when outbreaks of diseases spread. **Define** each pattern.

2. **Identify** three ways in which a disease causes symptoms.

3. **Differentiate** the ways pathogens can be transmitted to humans. Use the terms *direct contact, indirect contract,* and *vector* in your answer.

4. **Classify** these diseases as bacterial or viral: staphylococcal disease, herpes, gonorrhea, influenza, and HIV.

5. **Infer** why children get more colds than adults.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 37

Section 2: The Immune System

After reading the section in your textbook, respond to each statement.

1. **Define** *antibodies.*

2. **Explain** the function of nonspecific immunity.

3. **Summarize** the role of memory cells in the immune response.

4. **Compare** the functions of the different T cells in the specific immune response.

5. **Theorize** why a person sometimes has a fever when pathogens damage tissue. Use the term *inflammatory response* in your answer.

6. **Determine** which lasts longer—passive or active immunity. Explain.

Name _____ Date _____ Class _____

Section **Quick Check**

CHAPTER 37

Section 3: Noninfectious Disorders

After reading the section in your textbook, respond to each statement.

1. **Define** *degenerative diseases.*

2. **Explain** why the immune systems of most people do not injure their own cells.

3. **Distinguish** between an inflammatory response and an inflammatory disease.

4. **Contrast** the causes of rheumatoid arthritis and degenerative arthritis.

5. **Compare** an allergic response to anaphylactic shock.

6. **Determine** why people who live in warm areas have longer periods of allergic reactions to pollen than people who live in colder areas.

Name _____ Date _____ Class _____

CHAPTER 37

Assessment Student Recording Sheet

Section 37.1

Vocabulary Review

Write the vocabulary term that best completes each sentence.

1. _____ **2.** _____ **3.** _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

4. Ⓐ Ⓑ Ⓒ Ⓓ **6.** Ⓐ Ⓑ Ⓒ Ⓓ **8.** Ⓐ Ⓑ Ⓒ Ⓓ

5. Ⓐ Ⓑ Ⓒ Ⓓ **7.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

9. _____

_____

_____

10. _____

_____

_____

11. Careers in Biology Record your answer for question 11 on a separate sheet of paper.

Think Critically

12. _____

_____

_____

_____

_____

_____

13. _____

_____

_____

_____

Name _____ Date _____ Class _____

CHAPTER 37
Assessment

Student Recording Sheet

Section 37.2

Vocabulary Review

Write the vocabulary term that best matches each definition.

14. _____ **15.** _____ **16.** _____

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

17. Ⓐ Ⓑ Ⓒ Ⓓ **19.** Ⓐ Ⓑ Ⓒ Ⓓ **21.** Ⓐ Ⓑ Ⓒ Ⓓ

18. Ⓐ Ⓑ Ⓒ Ⓓ **20.** Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

22. _____

_____

23. _____

_____

_____

24. _____

_____

Think Critically

25. _____

_____

_____

26. _____

_____

_____

Section 37.3

Vocabulary Review

Write the vocabulary term that best answers each question.

27. _____ **28.** _____ **29.** _____

Name _____ Date _____ Class _____

CHAPTER 37

Assessment

Student Recording Sheet

Understand Key Concepts

Select the best answer from the choices given, and fill in the corresponding circle.

30. Ⓐ Ⓑ Ⓒ Ⓓ

31. Ⓐ Ⓑ Ⓒ Ⓓ

32. Ⓐ Ⓑ Ⓒ Ⓓ

33. Ⓐ Ⓑ Ⓒ Ⓓ

34. Ⓐ Ⓑ Ⓒ Ⓓ

Constructed Response

35. _____

_____

36. _____

_____

37. _____

_____

_____

Think Critically

38. Record your answer for question 38 on a separate sheet of paper.

39. _____

_____

_____

_____

Additional Assessment

40. Writing in Biology _____

_____

_____

_____

Document-Based Questions

41. _____

42. _____

_____

43. Record your answer for question 43 on a separate sheet of paper.

Cumulative Review

44.–45. Record your answers for questions 44 and 45 on a separate sheet of paper.

Name _____ Date _____ Class _____

CHAPTER 37

Assessment Student Recording Sheet

Standardized Test Practice

Multiple Choice

Select the best answer from the choices given, and fill in the corresponding circle.

1. Ⓐ Ⓑ Ⓒ Ⓓ	**3.** Ⓐ Ⓑ Ⓒ Ⓓ	**5.** Ⓐ Ⓑ Ⓒ Ⓓ	**7.** Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ	**4.** Ⓐ Ⓑ Ⓒ Ⓓ	**6.** Ⓐ Ⓑ Ⓒ Ⓓ	**8.** Ⓐ Ⓑ Ⓒ Ⓓ

Short Answer

Answer each question with complete sentences.

9. _____

10. _____

_____

11. _____

_____

12. _____

_____

_____

13. _____

_____

14. _____

_____

15. _____

_____

_____

Extended Response

Answer each question with complete sentences.

16. _____

_____

17. _____

_____

Essay Question

18. Record your answer for question 18 on a separate sheet of paper.