GLENCOE

UNDERSTANDING Psychology

Unit 3 Resources

The Workings of Mind and Body

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8787 Orion Place
Columbus, Ohio 43240-4027

ISBN: 978-0-07-877777-6
MHID: 0-07-877777-1

Printed in the United States of America.
1 2 3 4 5 6 7 8 9 10 047 10 09 08 07

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Understanding Psychology

Chapter 6 Resources
Body and Behavior

Name _____ Date _____ Class _____

Graphic Organizer Activity 6

The Three Parts of the Brain

Directions: The human brain is composed of three parts. Each part of the brain has several different structures with different functions. Complete the graphic organizer by listing each part of the brain and its location. Then list the structures that each part of the brain includes and the function of each of those structures.

THE THREE PARTS OF THE BRAIN		
Part of Brain:	**Includes These Structures:**	**Function of Each Structure:**
Location:		
Part of Brain:	**Includes These Structures:**	**Function of Each Structure:**
Location:		
Part of Brain:	**Includes These Structures:**	**Function of Each Structure:**
Location:		

Name _____ Date _____ Class _____

CRITICAL THINKING SKILLS ACTIVITY 6

Distinguishing Fact From Opinion

Directions: For each of the following statements, write *Fact* or *Opinion* to identify the item as a fact or an opinion. Then explain your reasoning.

1. The human brain has 100 million brain cells, which is 10 times more than monkeys.

_____

2. When Egyptian pharaoh Tutankhamen was mummified, his heart, liver, lungs, stomach, and intestines were preserved. The brain, however, was removed from his skull and discarded.

_____

3. It seems to me that I study best when I am listening to my favorite music. Listening to music must stimulate the parts of my brain that help me concentrate.

_____

4. Although the cause of multiple sclerosis has not yet been discovered, doctors do know that the disease destroys the myelin sheath that protects the axons.

_____

5. Sir Francis Galton believed that people with large heads had larger brains and were, therefore, more intelligent.

_____

6. The goal of education is to engage students in the learning process. It is my judgment that the best way to engage students is to appeal to all their senses. Therefore, I recommend to the board that they approve the spending plan that will allow us to bring dynamic multimedia presentations into every classroom.

_____

7. Our clients say that rhythmic, electronically altered music effectively manages their pain. They report that the music seems to move like a slow, swinging pendulum from one brain hemisphere to the other.

_____

8. Several writers have suggested that men use the left side of their brain, while women use the right side.

_____

9. About nine out of ten people are right-handed.

_____

10. I think the most profitable area of psychology is biological psychology.

_____

Name _____ Date _____ Class _____

Reteaching Activity 6

Body and Behavior

Terms and Concepts

Directions: Use the words from the word list to complete the following sentences.

autonomic nervous system	**lobes**	**neurons**
endocrine system	**midbrain**	**neurotransmitters**
hindbrain	**synapse**	**pituitary gland**
somatic nervous system		

1. The _____ controls voluntary movement of the skeletal muscles.
2. The cells along which messages travel to and from the brain are known as _____.
3. The _____ is the small part of the brain above the pons that relays sensory information.
4. The _____ uses hormones to transmit information to and from the brain.
5. The gap between individual nerve cells is the _____.
6. Internal biological functions are controlled by the _____.
7. The _____ is the central control for the endocrine system.
8. The _____ is the part of the brain that sustains the basic processes of life.
9. The rate at which neurons fire is determined by the _____.
10. The _____ are the different regions of the cerebral cortex.

Connecting Ideas

Directions: For each dialogue below, indicate the gland that is likely to be involved and describe how it is involved. Write your answers in the space provided.

11. "I can't seem to keep the weight on. I eat normal portions and even splurge on desserts, but I've lost five pounds in the last month. I'm also having trouble sleeping. I toss and turn for more than an hour before I fall asleep. I often awaken during the night and can't get back to sleep. What is wrong with me?"

_____

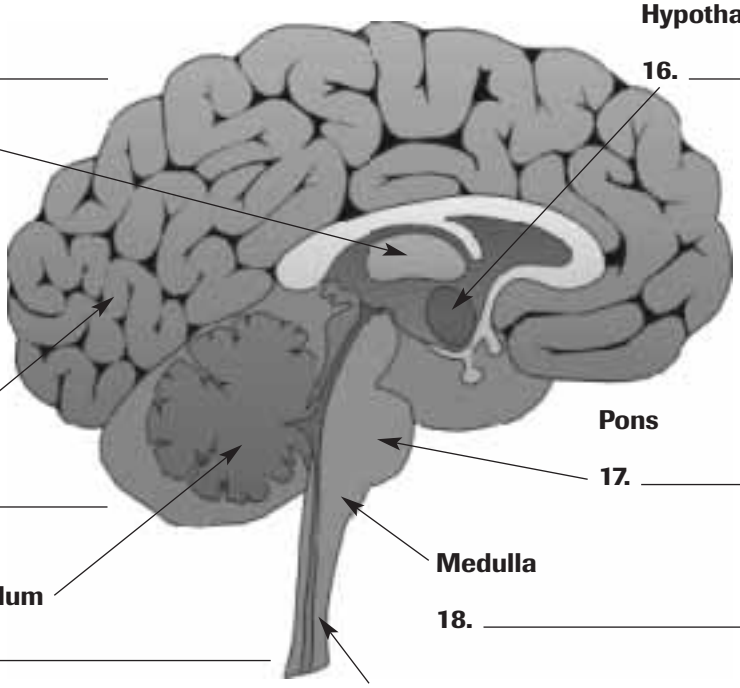
12. "Yesterday, I thought someone was following me. I didn't see anyone around, but I still felt like someone was there. I got so frightened that I ran almost a half a mile to get home. I thought I was really out of shape, but I didn't have any problem running that far."

_____

Name _____ Date _____ Class _____

Visualizing Information

Directions: On the lines beneath or beside each part of the brain, list the function or purpose of that part of the brain.



Working with Psychology

Directions: New technologies are allowing researchers to learn more about how the brain functions. Find an article about a recent development or technological advance that is allowing researchers to map the brain and locate specific activity centers. Below or on a separate sheet of paper, write a summary of the article including an explanation of how the technology can help psychologists learn more about human behavior.

20. _____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____ Class _____

ENRICHMENT ACTIVITY 6

Genetics, Environment, and Personality

Directions: Read the following material, then answer the questions on a separate sheet of paper.

Scott and Mark Kelly are identical twins. Like many identical twins, they share many personality traits and interests. In December 1999, Scott Kelly piloted the space shuttle *Discovery*. His twin brother, Mark, is also a space-shuttle pilot who hopes to be chosen for a shuttle mission in the near future. Scott was not the first identical twin in space. On April 21, 1972, identical twin Charlie Duke, Jr., became the tenth person to set foot on the moon. Charlie's twin, Bill, is not an astronaut; he is a doctor. During childhood, Bill suffered from a heart defect that limited his physical activity. Researchers wonder how Bill's physical limitations affected his development and career choice. The contrasts between the two sets of identical twins illustrate the ongoing search to discover what role heredity and the environment play in who we become.

Consider the following examples of similarities between specific identical twins.

Identical Twins	Reported Similarities
David and Dean Kopsell	• They have the same IQ. • They share the same interests. • Both have earned doctorates in horticulture.
Harold and Bernard Shapiro	• Both are university presidents. • Both accepted their current jobs after initially turning them down. • Both are neat, orderly, and friendly. • Both enjoy opera.
Judith and Julie Swain	• Both serve as chairs of the cardiology departments at universities. • Each credits her career choice to doctors seen on television shows as children. • Both are workaholics. • Both have cats. • Both are ambitious and seem to have unlimited energy. • Both enjoy sports activities.
Richard and Robert Tenniswood	• Both were machinists. • Both had heart attacks on the same day while mowing their grass; the blockages in their arteries were nearly identical.
Karen and Christine McEvoy	• Both are world-class triathletes and each other's major competition.
Jim Lewis and Jim Springer (separated at birth)	• They share the same physical characteristics. • They speak with the same inflections and make the same gestures. • Both love stock car racing and hate baseball. • Both married and divorced women named Linda and later remarried women named Betty. • Both suffer from migraine headaches and high blood pressure.

In 1979, the Minnesota Center for Twin and Adoption Research (MICTAR) began a study to determine the degree to which heredity influences personality traits and intelligence. The Minnesota Study of

(continued)

Name _____ Date _____ Class _____

Twins Reared Apart, the largest of its kind, reported on 56 sets of identical twins who were reared apart. The twins ranged in age from 19 to 68, with a mean age of 41 years.

Researchers used the identical twins reared apart as the experimental group and identical twins raised together as the control group. The volunteer twins underwent a battery of medical and psychological assessments. The twins also completed a checklist of facilities available in the households in which they were reared. The checklist included such items as power tools, sailboats, telescopes, unabridged dictionaries, and original artwork.

All participants in the experimental group were reared apart during their formative years. Although some had reestablished contact before participating in the study, some experienced their first reunion at the time of the study.

The study showed that about 70 percent of the differences in IQ were accounted for by heredity. The twins reared apart had a 0.69 correlation on the Wechsler Adult Intelligence Scale (WAIS). The control group twins (those raised together) had a 0.88 correlation on the same scale. Personality characteristics were also highly correlated with a genetic component in both twin groups. Leadership ability, shyness, aggression, orderliness, social closeness, fears, phobias, religiosity, and a wide range of other traits as well as choice of occupation and hobbies were very similar in both groups, supporting the strong influence of genetics.

In contrast, the environments in which the twins raised apart grew up showed a low correlation. Intellectual opportunities, material possessions, and adoptive father's education were not considered similar.

Critics of the MICTAR study question the extent to which genetics molds personality and determines IQ. The critics contend that the MICTAR participants were not selected at random and that there are no precise ways to measure personality and IQ.

Others familiar with the MICTAR project believe it is unlikely that one gene determines one personality trait. Rather, they propose a twist on the nature versus nurture controversy. They suggest a nature via nurture concept in which temperament and IQ select one's experiences and result in different responses. For example, active youngsters with adventurous personalities have different experiences than do passive, timid youngsters. Although IQ may be preset by inheritance, parents and teachers can influence the rate at which learning occurs and can provide an environment to optimize learning. The IQ differences between twins separated at an early age and those living together were greater than personality differences between the groups. This may be indicative that parents take a more active role with regard to IQ than they do for personality.

Questions

Directions: Answer the following questions on a separate sheet of paper.

1. How does the MICTAR study support or refute the idea that one's IQ can be influenced by the environment in which one is raised?
2. Using the sample below, create a table to compare the characteristics of the identical twins mentioned in this activity. If you know any identical twins, research characteristics about them and add them to the table.

	Similarities		
Identical Twins	**Physical**	**Personality**	**Intelligence**
David and Dean Kopsell			

3. To what extent do you think your personality traits, intelligence, and emotional development are the result of your genes? To what extent are they the result of your environment?

Application Activity 6

The Nervous System at Work

Objective
To explain how various parts of the brain work.

Overview
Students will list the parts of the brain that would be affected or involved in certain behaviors.

Introducing the Activity
Explain to students that the human nervous system is a complex bundle of nerve cells that transmit electric signals. The brain is the central command center for this complex network.

Instructions for Students
Tell students to complete the activity sheet by listing the parts of the brain that are affected for each event. Afterward, ask students to choose one of the events and provide a detailed description of how the nervous system is affected.

Answer Key

1. Parts of the brain affected are thalamus, hypothalamus, and autonomic nervous system (sympathetic nervous system).

2. Parts of the brain affected are somatosensory cortex, temporal lobe, thalamus, adrenal gland, and autonomic nervous system (sympathetic nervous system).

3. Parts of the brain affected are the temporal lobe.

4.–5. Answers will vary but should include the brain parts appropriate to the event named.

6.–7. Answers will vary. For example, if you were to burn your hand, the peripheral nervous system would send impulses through neurons to the spinal cord. By a simple reflex action, the afferent neurons would tell your arm muscles to jerk your hand back. The spinal cord would simultaneously relay the message to the brain. In the brain stem, the reticular activating system and thalamus would let the signal through to the cerebral cortex where the somatosensory cortex would register the feeling and the message would be passed to the association cortex. You would say "ouch," using the speech, memory, and motor cortex parts of the cerebral cortex. The heart, having speeded up, would already be returning to normal. The pain signals being registered in the somatosensory cortex would cause you to react to ease the pain. The pain reliever would interfere with the chemical in the synapses to block the signals from reaching the central nervous system. Although you will forget about the burn, the brain stores the incident in memory.

Discussion Questions

1. How do the central nervous system and brain work together? *(The central nervous system transmits information from other parts of the body to the brain. The brain processes the information and returns signals to the central nervous system as needed.)*
2. What part of the brain alerts it to incoming signals? *(The reticular activating system [RAS], lets the rest of the brain know of incoming signals.)*
3. How does an injury to the central nervous system or the brain affect the body's ability to respond to stimuli? *(An injury to the central nervous system disrupts the transmission of information to the brain; therefore, the brain cannot respond. Injuries to certain parts of the brain can affect its ability to send responses to the central nervous system. Other types of brain injuries affect behavior, memory, or reasoning.)*

Extension Activity
Using the event you described in detail and a drawing of the central nervous system, trace the signal path of the event. Use one color to indicate the transmission of the signal to the brain and another color to indicate the response.

Name _____ Date _____ Class _____

STUDENT WORKSHEET

Application Activity 6

The Nervous System at Work

Directions: Read each event in the first column. List the part(s) of the brain that would be affected by the event in the second column. Then list two additional events of your own in the first column and identify the part(s) of the brain that would be affected in the second column. Finally, select one of the events and write a detailed description of how the nervous system would be affected by the event.

Event	Part(s) of Brain Affected
1. You are about to take a test and your heart beats faster. You get very hot and begin sweating.	
2. You are asleep. There is a loud noise. You awaken.	
3. You hear your favorite song.	
4. _____	
5. _____	

Drawing Conclusions

Directions: Answer the following questions in the space provided.

6. Situation you selected for detailed analysis:

_____

7. Analysis of situation:

_____

_____

_____

_____

_____

_____

Understanding Psychology

Chapter 6
Section Resources

Name _____ Date _____ Class _____

Vocabulary Activity 6-1

The Nervous System: The Basic Structure

Directions: Read each statement below and then write the letter of the correct answer in the space provided.

_____ **1.** The brain and the spinal cord comprise the
- **A.** central nervous system.
- **B.** peripheral nervous system.
- **C.** neurotransmitters.
- **D.** autonomic nervous system.

_____ **2.** Messages move to and from the brain along thin cells called
- **A.** neurotransmitters.
- **B.** synapses.
- **C.** neurons.
- **D.** axons.

_____ **3.** The space between neurons is the
- **A.** neurotransmitter.
- **B.** axon.
- **C.** dendrite.
- **D.** synapse.

_____ **4.** The nerves that branch beyond the spinal cord are the
- **A.** central nervous system.
- **B.** peripheral nervous system.
- **C.** neurons.
- **D.** myelin sheath.

_____ **5.** Voluntary movements are controlled by the
- **A.** autonomic nervous system.
- **B.** peripheral nervous system.
- **C.** somatic nervous system.
- **D.** brain.

_____ **6.** The _____ can excite a neuron or stop it from transmitting.
- **A.** neuron
- **B.** synapse
- **C.** central nervous system
- **D.** neurotransmitter

_____ **7.** One's heartbeat is controlled by the
- **A.** autonomic nervous system.
- **B.** peripheral nervous system.
- **C.** somatic nervous system.
- **D.** neurotransmitters.

Directions: Answer the following question in the space provided.

8. Describe the three types of neurons.

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 6-1

The Nervous System: The Basic Structure

For use with textbook pages 155–159

Directions: Outlining Locate the heading in your textbook. Then use the information under the heading to help you write each answer.

I. The Nervous System: The Basic Structure

A. Introduction

1. What feeling do runners get from "runner's high"? _____

2. What produces "runner's high"? _____

B. How the Nervous System Works

1. What two parts make up the nervous system? _____

_____

2. What tasks do nerves perform? _____

_____

3. What protects the brain, spinal cord, and peripheral nerves? _____

_____

4. What is meant by the "all-or-none" principle of neuronal firing? _____

_____

5. What are the four basic parts of a neuron? _____

_____

6. What purpose does the myelin sheath serve? _____

_____

7. How do neurotransmitters help transmit impulses between neurons? _____

_____

8. What different jobs do afferent neurons, efferent neurons, and interneurons have? _____

_____

_____

9. What is the difference between the somatic and autonomic nervous systems? _____

_____

Name _____ Date _____ Class _____

Vocabulary Activity 6-2

Studying the Brain

Directions: Complete each sentence by writing the term that best completes the sentence.

computerized axial tomography (CT)	lobes
electroencephalograph (EEG)	magnetic resonance imaging (MRI)
forebrain	midbrain
hindbrain	positron emission tomography (PET)

1. The _____ is involved in the most basic processes of life.
2. _____ is an imaging technique used to identify brain injuries and deterioration.
3. The _____ covers the brain's central core.
4. _____ enables researchers to study brain activity and brain structure.
5. The _____ can be used to record the electrical activity of the brain.
6. The cerebral cortex is divided into different regions known as _____.
7. The _____ integrates sensory information and relays it upward.
8. The _____ can capture a picture of the brain as different parts are being used.

Directions: Answer the following questions in the space provided.

9. Describe the functions of three parts of the forebrain.

_____

_____

_____

_____

_____

10. How do psychologists study the brain?

_____

_____

_____

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 6-2

Studying the Brain

For use with textbook pages 160–168

Directions: Filling in the Blanks Use your textbook to fill in the blanks using the words in the box.

behavior	**hypothalamus**	**pons**
brain waves	**limbic system**	**reticular activating system**
cerebellum	**magnetic resonance imaging**	**right hemisphere**
cerebral cortex	**medulla**	**thalamus**
electrodes	**occipital lobe**	

The Three Brains

The **1** _____ helps control posture and balance. The **2** _____ controls breathing and a variety of reflexes, while the **3** _____ functions as a bridge to interconnect messages between the spinal cord and brain. The **4** _____ _____ alerts the rest of the brain to incoming signals.

The forebrain includes the **5** _____, which is a relay station for all the information that travels to and from the cortex, and the **6** _____, which controls functions such as hunger and body temperature. The **7** _____ _____ gives you the ability to learn and store complex information, and the **8** _____ _____ regulates emotions and motivations.

Visual signals are processed in the **9** _____ _____. The **10** _____ _____ controls the left side of the body.

How Psychologists Study the Brain

Psychobiologists study the role of the brain in **11** _____. **12** _____ _____ occur because the neurons in the brain tend to increase or decrease their amount of activity in unison. **13** _____ may be used to set off the firing of neurons as well as to record it. **14** _____ _____ _____ involves passing non-harmful radio frequencies through the brain, allowing researchers to study the structure of the brain as well as to identify tumors or types of brain damage.

Name _____ Date _____ Class _____

Vocabulary Activity 6-3

The Endocrine System

Directions: Fill in each blank below with the word or words that best fit the sentence.

The **1** _____ system sends chemical messages to and from the brain. The glands that are part of this system include:

2 _____

3 _____

4 _____

5 _____

The master gland that controls the chemical messages of other glands is the **6** _____. This gland is located **7** _____. The brain structure that controls this gland is the **8** _____. This brain structure monitors **9** _____ levels and relays messages to correct imbalances.

Neurotransmitters and hormones control the actions of the nervous system. Hormones travel through the **10** _____. Some chemicals such as **11** _____ function as both a neurotransmitter and a hormone.

Directions: Answer the following question in the space provided.

12. What are the differences in communication with the brain between the nervous system and the endocrine system?

Name _____ Date _____ Class _____

Guided Reading Activity 6-3

The Endocrine System

For use with textbook pages 170–173

Directions: Recalling the Facts Use the information in your textbook to answer the questions.

1. What causes the "rush" people experience when doing something risky, such as running with bulls at the Pamplona fiesta? _____

2. In what way is the endocrine system like the nervous system? _____

3. Why are endocrine glands also called ductless glands? _____

4. What are three ways that hormones affect behavior? _____

5. How does the pituitary gland act as the master gland? _____

6. What is hypothyroidism and how does it make people feel? _____

7. When a person is angry or frightened, how do the adrenal glands prepare the person for action? _____

8. What do ovaries produce? _____

9. How does testosterone affect males in adolescence? _____

10. What is the difference between a hormone and a neurotransmitter? _____

11. As organisms grew more complex, their single communication system split into two. How did these two systems differ in the kinds of messages they sent? _____

Name _____ Date _____ Class _____

Vocabulary Activity 6-4

Heredity and Environment

Directions: Use the clues to fill in the blanks to complete the words.

1. _ _ _ _ _ _ — the basic building blocks of heredity

2. _ — two children that result from the same pregnancy and who come from two different eggs fertilized by two different sperm

3. _ _ _ _ _ _ _ _ _ _ — the genetic transmission of characteristics from parents to their offspring

4. _ — two children that result from the same pregnancy and who come from one egg

Directions: Answer the following question in the space provided.

5. Write a paragraph that uses all four terms above and describes the nature-nurture argument.

Name _____ Date _____ Class _____

Guided Reading Activity 6-4

Heredity and Environment

For use with textbook pages 174–176

Directions: Filling in the Blanks Use your textbook to fill in the blanks using the words in the box.

behavior	**heredity**	**monozygotic**
dizygotic	**identical twins**	**nature**
environment	**instinctive**	**nurture**
fraternal twins	**John Watson**	**Sir Francis Galton**
genes	**learned**	

Heredity and Environment

1 _____ establish(es) what you could be, and **2** _____ define(s) the final product. People often argue about whether human behavior is **3** _____ (due to heredity) or **4** _____ (due to environment). **5** _____ is the genetic transmission of characteristics from parents to their offspring. In the nature—nurture question, **6** _____ refers to environmental factors, such as family, culture, education, and individual experiences; **7** _____ refers to the characteristics that a person inherits—his or her biological makeup.

8 _____ _____ _____ became one of the first to preach the importance of nature in the modern era. He found that success ran in families and concluded that heredity was the cause. Many psychologists, however, have emphasized the importance of the environment. The tone was set by **9** _____ _____, the founder of behaviorism.

Genes build and modify the body's physical structures, which must then interact with their environment to produce **10** _____. One way to find out whether a trait is inherited is to study twins. **11** _____ _____ develop from a single fertilized egg (thus they are called **12** _____) and share the same genes. **13** _____ _____ develop from two fertilized eggs (thus, **14** _____), and their genes are no more similar than those of brothers or sisters.

Understanding Psychology

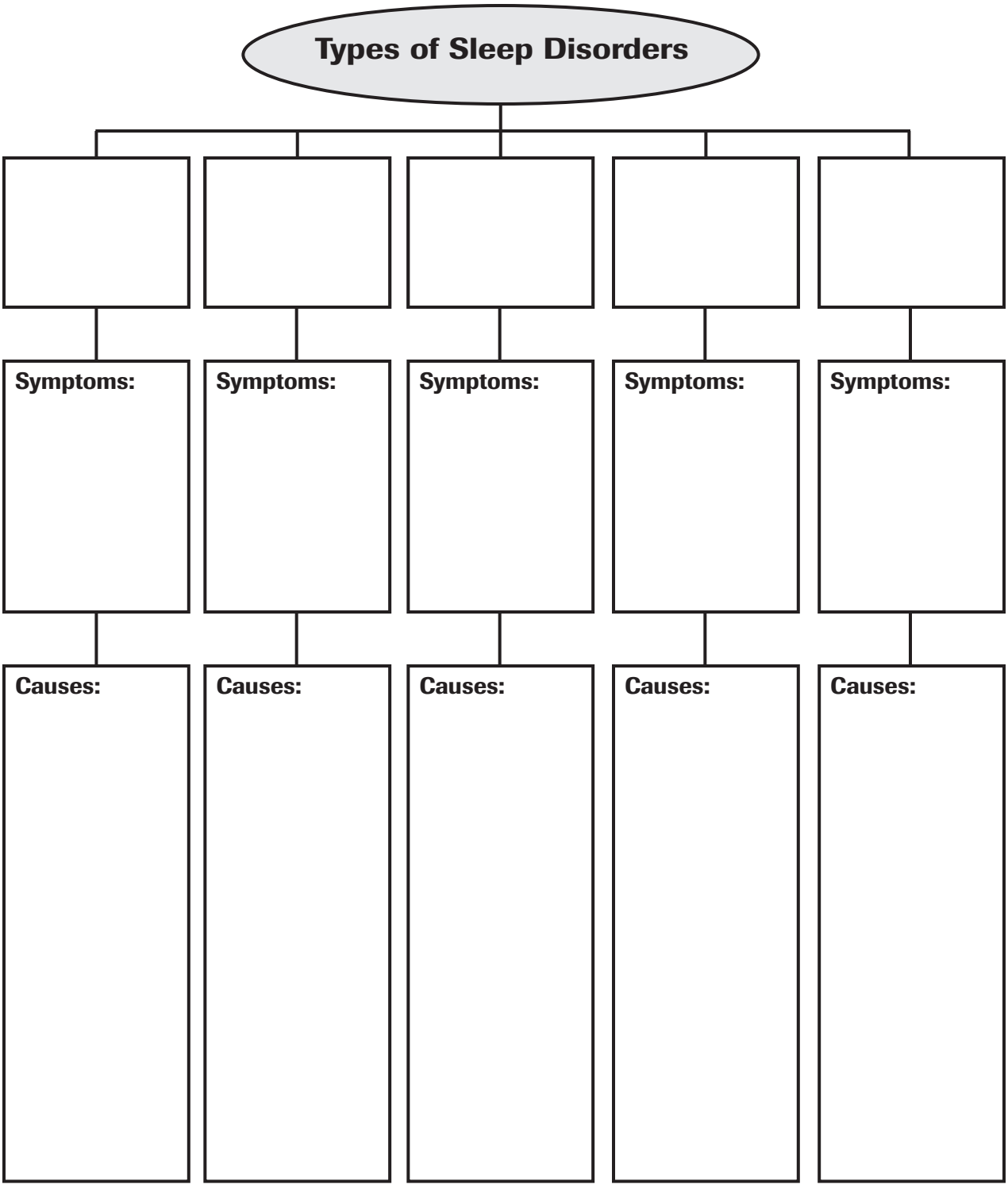
Chapter 7 Resources
Altered States of Consciousness

Name _____ Date _____ Class _____

Graphic Organizer Activity 7

Types of Sleep Disorders

Directions: There are at least five major sleep disorders. Complete the graphic organizer by listing five sleep disorders in the first row of boxes. Then list their symptoms and their causes, if known. Not all sleep disorders have causes that are known.

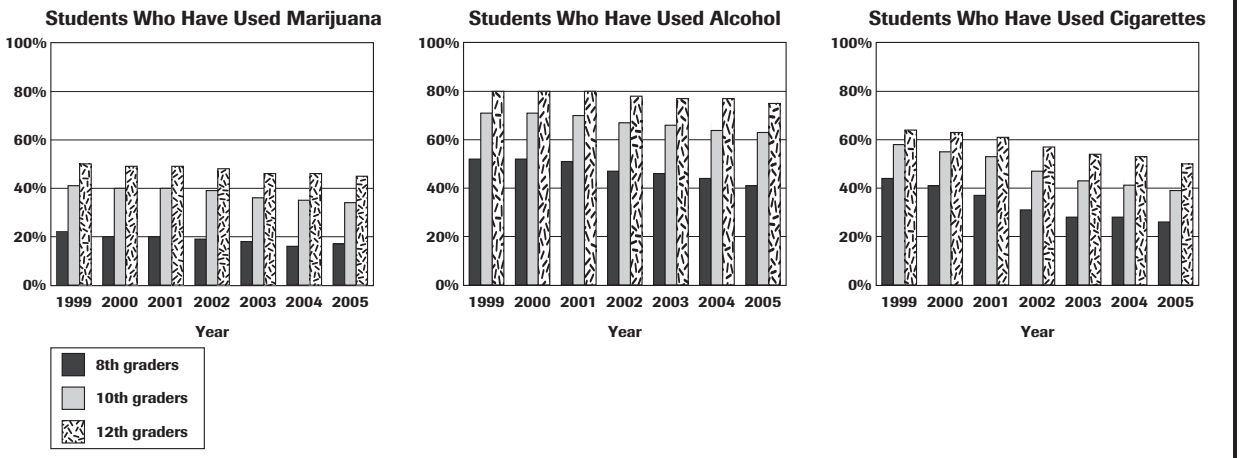


Name _____ Date _____ Class _____

CRITICAL THINKING SKILLS ACTIVITY 7

Interpreting Charts, Tables, Graphs, and Diagrams

Directions: Use the bar graphs to answer the following questions in the space provided.



1. Which substance shows the lowest usage at all grade levels?

_____

2. What is the usage trend for all substances from 8th to 12th grades?

_____

3. What is the trend in cigarette usage for all grade levels from 1999 to 2005? How would you explain this trend?

_____

_____

4. An Omnibus Sleep in America poll conducted by the National Sleep Foundation reported that 62 percent of adults felt drowsy when driving at some point during the past year. Of those adults, younger adults were more likely to drive while drowsy, as shown in the following table:

Age Group	Percentage Who Drive While Drowsy
18 to 29 year olds	73%
30 to 64 year olds	62%
65 years of age and older	32%

Use the numbers in the table to create two graphs: a line graph and a bar graph. Make sure that the graphs have a title, a key, and proper labels.

Name _____ Date _____ Class _____

Reteaching Activity 7

Altered States of Consciousness

Terms and Concepts

Directions: In the blank at the left of each description, write the letter of the term that matches the description. Not all terms will be used.

A. biofeedback
B. circadian rhythm
C. consciousness
D. hallucinations
E. hypnosis
F. insomnia
G. marijuana
H. meditation
I. narcolepsy
J. night terrors
K. REM sleep
L. sleep apnea

_____ **1.** perceptions that have no external cause

_____ **2.** sleep disruptions that involve screaming, panic, or confusion and occur during Stage IV sleep

_____ **3.** learning to control bodily states with the help of specialized machines

_____ **4.** a drug that intensifies sensory experiences and produces an altered state of consciousness

_____ **5.** one's biological clock that is genetically programmed to regulate physiological responses

_____ **6.** failure to get enough sleep at night in order to feel rested the next day

_____ **7.** when dreaming occurs

_____ **8.** a state of consciousness in which attention is narrowly focused and a person responds to suggestion

_____ **9.** a technique that focuses attention to clear one's mind and produce relaxation

_____ **10.** a sleep disorder in which a person has trouble breathing while asleep

Visualizing Information

Directions: Fill in each block with an example of a behavior that applies to each category.

Stages of Sleep	Characteristics
Stage I	**11.**
Stage II	**12.**
Stage III	**13.**
Stage IV	**14.**
REM Sleep	**15.**

Name _____ Date _____ Class _____

Summarizing Information

Directions: Use the space below to complete the following statements that summarize information about hypnosis.

16. Hypnosis is _____

_____

_____

_____

_____

17. Hypnosis is not _____

_____

_____

_____

18. Hypnosis may be used to _____

_____

_____

_____

Organizing Information

Directions: The lettered items in the Fact Bank describe the effects that certain drugs have on consciousness. Complete the diagram below by writing the letter of each item in the Fact Bank in the correct box in the diagram. The letters can be placed in more than one box.

.

FACT BANK

- **A.** causes perceptions that have no external cause
- **B.** interacts with a person's central nervous system
- **C.** most widely abused mind-altering substance
- **D.** lose contact with reality
- **E.** depresses the brain's normal functions
- **F.** modifies moods and emotions
- **G.** familiar objects may become distorted and unrecognizable
- **H.** use may be influenced by social expectations

19. Psychoactive Drugs	20. Hallucinogens	21. Alcohol
_____	_____	_____
_____	_____	_____
_____	_____	_____

Name _____ Date _____ Class _____

ENRICHMENT ACTIVITY 7

The History of Hypnosis

Directions: Read the following material, then answer the questions on a separate sheet of paper.

Throughout recorded history, various persons, such as medicine men, witch doctors, and religious leaders, have practiced hypnosis in different forms. During the eighteenth century, scientists and researchers began to study the validity of hypnosis.

From 1734 to 1815, Franz Anton Mesmer, a Viennese physician, drew attention to hypnosis. Mesmer believed that hypnotic phenomena could be produced by animal magnetism. Mesmer's patients grasped iron rods attached to a large tub filled with iron filings to receive the magnetic flow. Mesmer stated that the flow came from astral bodies and was channeled through his hands. An official scientific commission led by Benjamin Franklin exposed Mesmer in 1784, stating that his cures resulted from imagination rather than magnetism. His followers continued, however, for they recognized the importance of the phenomenon and backed the philosophy of experimentation and observation.

It was British physician James Braid who coined the word hypnotism from the Greek word *hýpnos* after the God of sleep. By the time Braid realized that hypnosis was not sleep, the term had gained popularity. This confusion between hypnosis and sleep conceals the real meaning and purpose of hypnosis. One definition of hypnosis states that ideas are presented in such a way that a desired result occurs.

Jean Charcot (1825–1893), a leading French neurologist, helped to make hypnosis a respected field of inquiry. He conquered the skepticism of the French Academy of Sciences by demonstrating that hypnosis is a neurological event, not the result of magnetism. His research and teaching influenced such prominent men as Sigmund Freud (1856–1939) and Pierre Janet (1859–1947).

Hippolyte Bernheim (1837–1919) and A.A. Liebeault (1823–1904) began to study the results of hypnotic therapy. They developed Braid's idea of hypnosis as a "suggestive" therapy, and together treated more than 12,000 patients.

During the 1800s, a heated controversy developed between the two leading schools of thought on hypnosis. The proponents of each position and their views are as follows:

Bernheim/Liebeault's Theory of Hypnosis	Charcot's Theory of Hypnosis
Hypnosis is a psychological state brought about by suggestion.	Hypnosis is a medical condition connected to hysteria.
Hypnosis requires no specific personality type.	Hypnosis requires a neurotic personality.

This controversy led to further scientific investigation, and ultimately greater clarity in the field. The Bernheim/Liebeault position was eventually shown to be the correct theory.

Hypnosis as a method of treatment was set back when Sigmund Freud, in 1895, rejected it in favor of his technique of psychoanalysis. Freud did not fully explain his rejection of hypnosis, but many speculate that Freud avoided its use because:

1. He was embarrassed that he could not hypnotize many patients to a sufficient depth.
2. The cures tended to be temporary, and posthypnotic suggestion could not be maintained.
3. He could not obtain buried traumatic material due to patients' resistance.

Despite Freud's personal disfavor, hypnosis was not discredited. Psychologists later refuted many of Freud's subjective criticisms.

(continued)

Name _____ Date _____ Class _____

The need for rapid treatment of war-related psychological problems among World War II veterans led to a dramatic increase in the use of hypnotherapy. Shortly afterward dentists began to experiment with hypnotherapy to control pain. Obstetricians also experimented with hypnotherapy to help pregnant women with labor pains.

In 1949, the Society for Clinical and Experimental Hypnosis was established to maintain high ethical and training standards. In 1955, the British Medical Association admitted that hypnosis, when applied medically, has the potential to relieve pain. The American Medical Association followed suit in 1958. Both societies supported the teaching of hypnosis in medical school programs but urged cautious use of it in practice. Hypnosis was later approved for the treatment of some psychological disorders and as an alternative form of pain management during childbirth and surgery.

In 1960, the American Psychological Association (APA) officially recognized the American Board of Examiners in Psychological Hypnosis. Practitioners meeting the specified qualifications are listed in the official directories of the APA. Division 30, Psychological Hypnosis, is dedicated to advancing research into the uses and techniques of effective experimental and clinical hypnosis. Hypnosis is used today to help people stop smoking, manage pain, and improve athletic performance.

Questions

Directions: Answer the following questions in the space provided.

1. A friend of yours recently slid on the ice and wrecked his car. Although his injuries were minor and no one else was injured, he cannot get back into a car, not even as a passenger. Would you recommend hypnosis as a form of treatment for him? Explain.

_____

_____

_____

_____

_____

2. Create a time line of the history of hypnosis.

3. Research how some athletes use hypnosis to prepare for major competitions. Write a report on your findings.

Application Activity 7

Altered States of Consciousness

Objective
To sensitize students to the differences between consciousness and altered states of consciousness.

Overview
Students will classify the activities listed in the first column as involving either consciousness or an altered state of consciousness.

Introducing the Activity
Point out to students that Chapter 7 defines an altered state of consciousness as one involving a change in mental processes—sensations, perceptions, and thought patterns. Stress that these are highly subjective variables. Explain that as they classify the listed activities, students will begin to form their own ideas about when an activity crosses the line leading to an altered state of consciousness.

Instructions for Students
Tell students to consider each of the activities listed and classify them appropriately. Be sure students think about how they will separate consciousness from altered states of consciousness.

Answer Key
1. Student answers will vary. Sleeping and daydreaming are the most obvious examples of altered states of consciousness. Students may make a case for any of the other items to be consciousness or altered consciousness.
2. Student answers will vary. Altered states of consciousness can help someone to concentrate. They can also help the body or mind to rest or heal.
3. Student answers will vary. Altered states of consciousness can cause accidents; they can isolate a person from what is going on around him or her, and when drugs are involved, they can become addictive and dangerous.

Discussion Questions
1. How do you define an altered state of consciousness? Is it different for each individual? *(The text defines an altered state of consciousness as a change in mental processes, not just a quantitative shift such as feeling more or less alert. Sensations, perceptions, and thought patterns actually change. The definition of an altered state of consciousness is the same for all people, but the subjective experience of the altered state can vary greatly from individual to individual.)*
2. Suppose an individual spends the majority of his or her waking hours praying and meditating. What would be an altered state for such a person? What about an alcoholic? Would that person's altered state be sobriety? *(Answers will vary. Using the text definition, some students may say that a person who prays or meditates the majority of the time would not be experiencing an altered state because his or her sensations, perceptions, and thought processes would not change. Some students may disagree. There may also be disagreement as to whether sobriety is an altered state for an alcoholic. Some students will say that the altered state is always the alcoholic state, while others may say that for this person the "normal" state is the alcoholic state and the altered state is sobriety.)*

Extension Activity
Keep a sleep diary for one week. Record the times that you sleep, including short naps. Also, record any dreams you remember. At the end of the week, review the events of the week. How did restful sleep or lack of sleep affect the events? Can you connect any of your dreams with events that occurred during the week?

Name _____ Date _____ Class _____

STUDENT WORKSHEET

Application Activity 7

Altered States of Consciousness

Directions: Read the list of activities in the first column. Determine whether each activity is a state of consciousness or an altered state of consciousness. Place a check mark in the appropriate column.

Activity	Altered State	Consciousness
1. Studying for a test		
2. Drinking coffee		
3. Daydreaming		
4. Listening to music		
5. Watching television		
6. Playing a video game		
7. Sleeping		
8. Surfing the Internet		
9. Taking a cold tablet		
10. Fasting for 24 hours		

Drawing Conclusions

Directions: Answer the following questions in the space provided.

1. What conclusions can you draw from the above chart? What is similar about the conscious activities? The altered-state activities?

_____

_____

2. What are the advantages of an altered state of consciousness? Give examples.

_____

_____

3. What are the drawbacks of being in an altered state of consciousness? Give examples.

_____

_____

Understanding Psychology

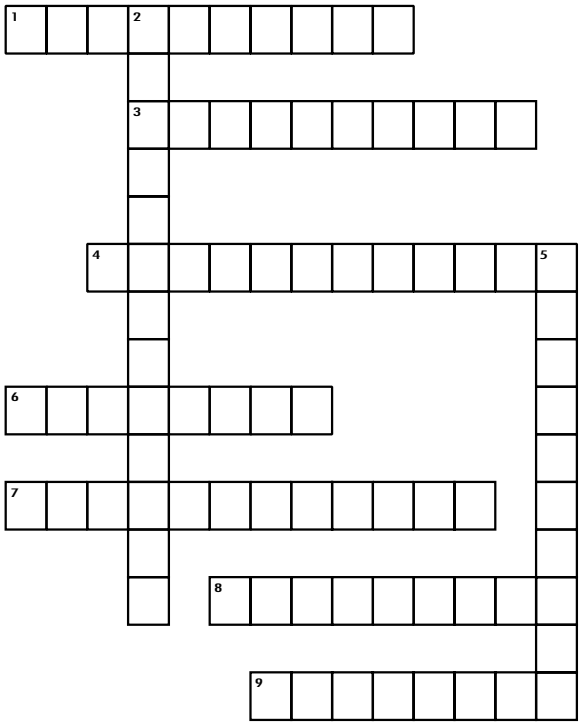
Chapter 7
Section Resources

Name _____ Date _____ Class _____

Vocabulary Activity 7-1

Sleep and Dreams

Directions: Use the following clues to complete the puzzle below, then answer the question in the space provided.



ACROSS

1. a sleep disorder in which someone falls asleep suddenly during the day
3. frightening dreams
4. sleep disruptions during Stage IV sleep involving screaming, panic, or confusion
6. the stage of sleep during which dreaming occurs
7. walking or carrying out behaviors while asleep
8. the rhythm set by a biological clock that regulates physiological processes
9. a prolonged inability to get enough sleep

DOWN

2. a state of awareness
5. a sleep disorder that causes frequent interruption in breathing

Directions: Answer the following question in the space provided.

10. Why do we dream?

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 7-1

Sleep and Dreams

For use with textbook pages 183–190

Directions: Recalling the Facts Use the information in your textbook to answer the questions.

1. What is sleep? _____

2. Describe three views on why we sleep. _____

3. What are the characteristics of Stage I sleep? _____

4. What happens during REM sleep? _____

5. What is jet lag and how do you cure it? _____

6. List five types of sleep disorders. _____

7. What are the causes of sleep apnea? _____

8. What is the difference between nightmares and night terrors? _____

9. How do dreams change as the night progresses? _____

10. Why did Sigmund Freud believe dreams are important? _____

Name _____ Date _____ Class _____

Vocabulary Activity 7-2

Hypnosis, Biofeedback, and Meditation

Directions: Read each statement below and then write the letter of the correct answer in the space provided.

_____ **1.** An altered state of consciousness characterized by heightened suggestibility is
A. biofeedback. **B.** hypnosis. **C.** meditation. **D.** posthypnotic suggestion.

_____ **2.** A person learns to control his or her physiological processes by using
A. biofeedback. **B.** hypnosis. **C.** meditation. **D.** posthypnotic suggestion.

_____ **3.** Ideas given during hypnosis to suppress memory are a form of
A. biofeedback. **B.** hypnosis. **C.** meditation. **D.** posthypnotic suggestion.

_____ **4.** Theodore Barber believed _____ was not a special state of consciousness.
A. biofeedback **B.** hypnosis **C.** meditation **D.** posthypnotic suggestion

_____ **5.** Focused attention that clears one's mind and results in relaxation is known as
A. biofeedback. **B.** hypnosis. **C.** meditation. **D.** posthypnotic suggestion.

_____ **6.** Mindfulness _____ focuses on the present moment.
A. biofeedback **B.** hypnosis **C.** meditation **D.** posthypnotic suggestion

_____ **7.** _____ involves using machines to inform a person of subtle changes in his or her body.
A. Biofeedback **B.** Hypnosis **C.** Meditation **D.** Posthypnotic suggestion

_____ **8.** Therapists use _____ to help clients reveal their problems and gain insights into their lives.
A. biofeedback **B.** hypnosis **C.** meditation **D.** posthypnotic suggestion

_____ **9.** When a person starts sneezing whenever she starts to light a cigarette, _____ may have been employed to help her change unwanted behaviors such as smoking or overeating.
A. biofeedback **B.** hypnosis **C.** meditation **D.** posthypnotic suggestion

_____ **10.** Using _____, a person can learn to relax a single muscle.
A. biofeedback **B.** hypnosis **C.** meditation **D.** posthypnotic suggestion

Directions: Answer the following question in the space provided.

11. What are common uses of hypnosis?

_____

_____

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 7-2

Hypnosis, Biofeedback, and Meditation

For use with textbook pages 191–195

Directions: Outlining Locate the heading in your textbook. Then use the information under the heading to help you write each answer.

I. Hypnosis, Biofeedback, and Meditation

A. Introduction

1. Some operations have been performed without using anesthesia. How is this possible? _____

_____

_____

B. What Is Hypnosis?

1. What is hypnosis? _____

_____

2. How does hypnosis work? _____

_____

3. Can a hypnotist force the participant to do things against his or her will? Why or why not? _____

_____

_____

4. What is the neodissociation theory of hypnosis? _____

_____

5. Give three examples of uses of hypnosis. _____

_____

_____

C. Biofeedback

1. How has biofeedback been used? _____

_____

2. What is the basic principle of biofeedback? _____

_____

D. Meditation

1. How can people benefit from meditation? _____

_____

_____

Name _____ Date _____ Class _____

Vocabulary Activity 7-3

Drugs and Consciousness

Directions: Complete each sentence using the terms below.

hallucinations	**marijuana**	**hallucinogens**
psychoactive drugs	**LSD**	

1. _____ is the dried leaves and flowers of the Indian hemp plant.
2. _____ are perceptions that have no direct external cause.
3. _____ interact with the central nervous system to alter a person's mood, perception, and behavior.
4. The best known and most potent hallucinogen is _____.
5. Psychedelic drugs are also known as _____.

Directions: Answer the following questions in the space provided.

6. What are the common effects of LSD?

7. List seven categories of psychoactive drugs and an example of each.

Name _____ Date _____ Class _____

Guided Reading Activity 7-3

Drugs and Consciousness

For use with textbook pages 197–202

Directions: Filling in the Blanks Use your textbook to fill in the blanks using the words in the box.

abusers	**depressant**	**perceptions**
alcohol	**dreaming**	**physically**
augments	**inhibit**	**plants**
breathing	**memory**	**psychologically**
control	**narcotics**	**synthetic**

Marijuana

Marijuana is not **1** _____ addictive but may cause people to become **2** _____ addicted. In general, marijuana **3** _____ sensory experiences. It also disrupts **4** _____ formation, making it difficult to carry out mental and physical tasks.

Hallucinations and Hallucinogens

Hallucinations are **5** _____ that have no direct external cause. Hallucinations can occur under normal conditions, such as when a person is **6** _____. Hallucinogens are found in **7** _____. One of the most powerful hallucinogens, however, is LSD, which is a **8** _____ substance.

Opiates and Alcohol

Opiates are usually called **9** _____. An overdose results in a loss of control of **10** _____. The most widely used and abused mind-altering substance in the United States is **11** _____. It is actually a **12** _____ that serves to **13** _____ the brain's normal functions.

Drug Abuse and Treatment

Drug **14** _____ are people who regularly use illegal drugs or excessively use legal drugs. The greatest risk associated with use of psychoactive drugs is loss of **15** _____.

Understanding Psychology

Chapter 8 Resources
Sensation and Perception

Name _____ Date _____ Class _____

Graphic Organizer Activity 8

Human Senses

Directions: Humans have several different senses. Each sense uses different receptors. The different receptors are triggered by different stimuli. Complete the graphic organizer by listing five of the senses in the first box of each column. Then list the receptors each sense uses and the type of stimuli needed to trigger that sense.

Sense	Sense	Sense
Receptors	**Receptors**	**Receptors**
Stimuli	**Stimuli**	**Stimuli**

Sense	Sense
Receptors	**Receptors**
Stimuli	**Stimuli**

Name _____ Date _____ Class _____

CRITICAL THINKING SKILLS ACTIVITY 8

Designing an Experiment

Directions: Use the information below as well as your textbook to design an experiment to test the signal-detection theory.

The absolute threshold theory holds that there is a minimum level of a stimulus that will produce a response in 50 percent of subjects. The signal-detection theory extends the absolute threshold theory to recognize that we rarely receive a single stimulus in isolation. The signal-detection theory seeks to identify the minimum amount of a stimulus that can be detected among competing stimuli. For example, assume you are cooking an Italian dinner. What amount of garlic can you use and not have the house smell like garlic to most of your guests?

You will design an experiment using sound to test the signal-detection theory. Use the following steps to design and conduct the experiment.

1. Gather information about the types of sounds that are common in your surroundings. Identify an important sound that your friends or classmates would easily recognize. Identify sounds that frequently compete with the chosen sound.
2. Form a hypothesis using the signal-detection theory.

   State your hypothesis: _____

   _____
3. Design the experiment to test your hypothesis. Your design should:
   - Identify the dependent and independent variables.

     State your variables:

     Dependent Variable: _____

     Independent Variable: _____
   - Explain how you will set up and conduct the experiment. (Who will be the participants? What will they be asked to do? How will you record the results? Where will you conduct the experiment?)
   - Describe how you will control the independent variable(s).
4. Conduct the experiment.
5. Collect the data from the experiment and graph the results.
6. Analyze the results and determine if your hypothesis is true or false.

   Was the hypothesis confirmed or contradicted? Explain. _____

   _____

   _____

   _____
7. Write a report of your findings.

Name _____ Date _____ Class _____

Reteaching Activity 8

Sensation and Perception

Terms and Concepts

Directions: Use the clues below to find the hidden words. Circle the words as they are found.

1. The _____ regulates the amount of light entering the eye.
2. The _____ system controls the sense of balance and connects the inner ear to the brain by a nerve.
3. When a stimulus activates a receptor, a(n) _____ occurs.
4. _____ describes the sense of movement and body position.
5. _____ are perceptions that misrepresent physical stimuli.
6. A(n) _____ experience results from organizing bits of information into meaningful wholes.

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

7. The _____ carries impulses from the retina to the brain.
8. The study of the relationships between sensory experiences and the physical stimuli that cause them is known as _____.
9. Light-sensitive receptor cells are found in the _____ of the eye.
10. _____ describes the tendency to perceive objects in the same way regardless of changing angle, distance, or lighting.
11. The _____ nerve carries smell impulses from the nose to the brain.
12. _____ is the organization of sensory information into meaningful experiences.
13. The _____ changes shape to focus light on the retina.

Name _____ Date _____ Class _____

Organizing Information

Directions: For each type of perception described below, select the type of perceptual organization being described. Write the correct choice in the blank to the left of the number.

constancy	illusion
depth perception	perceptual inference
extrasensory perception	subliminal perception
figure-ground perception	

_____ **14.** You see the Statue of Liberty several times as you tour Manhattan. From all angles you know the approximate size of the statue.

_____ **15.** A friend always seems to know what you are thinking before you say anything. You are convinced the person has psychic powers.

_____ **16.** You are on a road trip driving across the country. You are driving along a wheat field and you can see the texture of the mature grain. On the horizon, you see blue and purple figures rising from the ground. You decide that these are not a weird cloud formation, but the Rocky Mountains.

_____ **17.** You round a bend and immediately enter a tunnel. Although you slow the car while your eyes adjust, you proceed with the expectation that the road continues.

_____ **18.** A friend tells you that the local mall has begun including subtle messages such as "Buy more," and "Shop the mall" in the standard sound track that plays continuously. On your next trip to the mall, you sit in the common area and listen closely to the sound track. You do not hear anything out of the ordinary.

_____ **19.** You take a young child to see the circus. Between acts, magicians circulate through the crowd and perform. The child is selected as a helper, and the magician appears to pull a dollar bill from the child's ear. The child later asks you if there is more money in her ear.

_____ **20.** You are in a crowded airport terminal. Due to bad weather many flights have been cancelled and the noise in the airport builds as the number of people waiting for rescheduled flights grows. Above the din, you hear your neighbor call your name.

Visualizing Information

Directions: Fill in the table below by entering the sense and a specific stimulus associated with each of the receptors listed.

Receptor	Sense	Stimulus
21. rods and cones		
22. nerve fibers in muscles		
23. taste buds		
24. hair cells of semicircular canals and vestibule		
25. hair cells of olfactory membrane		

Name _____ Date _____ Class _____

ENRICHMENT ACTIVITY 8

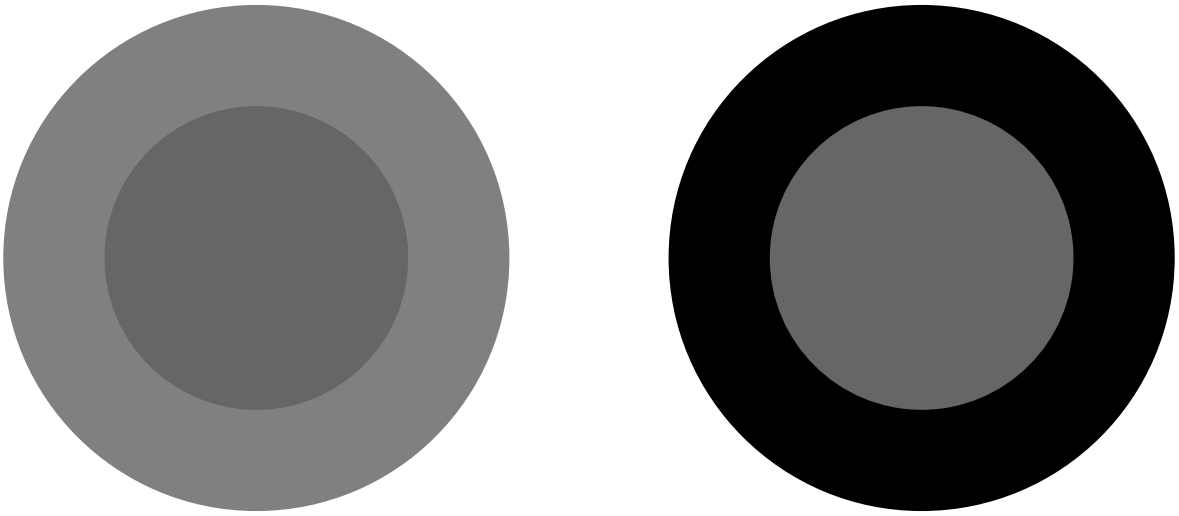
Illusion and Perception

Directions: This activity consists of two parts. The first explores perception and reality; the second shows how we fill in missing details. Read the material for each activity and complete the questions in the space provided.

Does perception give us an accurate view of reality? Most of us would respond that perception does show us what is real. You know that the chair upon which you are sitting is real. You knew it was real when you saw it, and you knew it was real when you sat on it and it supported your weight. In this sense, our perceptions form reality. Our perceptions, however, are limited and may be deceiving.

Questions

Directions: Look at the two circles. Then answer the questions in the space provided.



1. Which center circle is darker?

_____

2. What affects how you see the center circles?

_____

_____

_____

3. What does this example indicate about the accuracy of perceptions?

_____

_____

_____

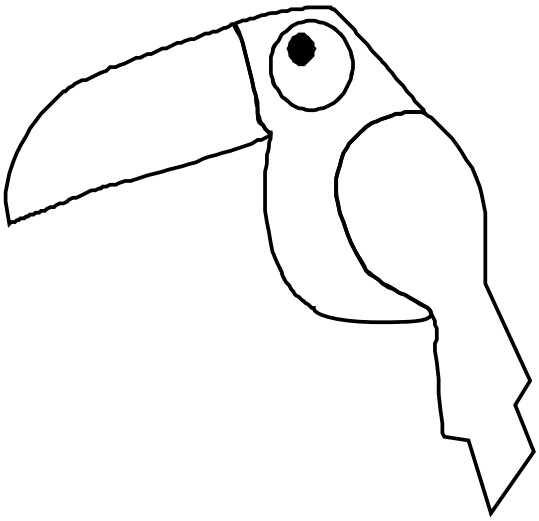
(continued)

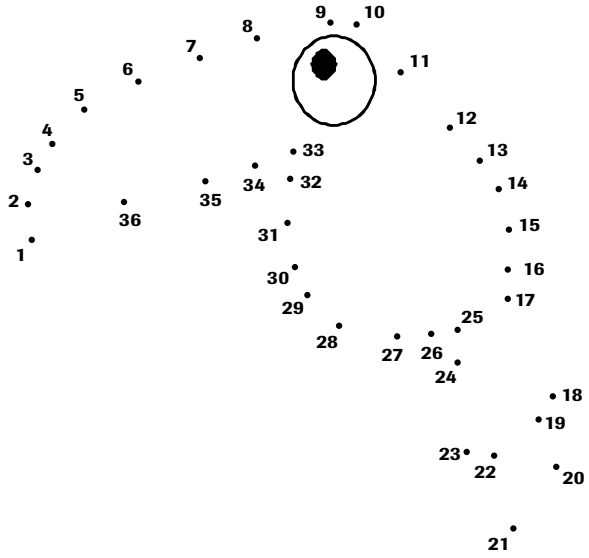
Name _____ Date _____ Class _____

Filling in Details

Do you remember as a child working on "connect the dots" puzzles to help you learn to count? You would connect the dots beginning with 1 and work to the last number. When you completed the task correctly, a recognizable picture such as a picture of an animal would emerge.

If you were to pick up a children's "connect the dots" book today, you would likely be able to recognize the shapes or pictures without actually connecting the dots. Why is this? The makers of these puzzles use "point of change" to position the dots. The dots are placed wherever the angle of the picture changes. This allows the observer to automatically fill in the details. The following example demonstrates this principle.





Questions

Directions: Based on the points of change activity above, answer the following questions in the space provided.

4. Why are the dots placed at points of change?

_____

_____

5. What allows you to recognize the shape without actually connecting the dots, while a young child cannot recognize the shape until the dots have been connected?

_____

_____

6. Use the space below to create a "connect the dots" puzzle applying the points of change principle.

Application Activity 8

The Eye's Blind Spot

Objective
To demonstrate the existence of the "blind spot" in the human retina.

Overview
Students will find their blind spot.

Introducing the Activity
Explain to students that the retina has a "blind spot," the site in the retina at which the optic nerve leaves the eye.

Instructions for Students
Ask students to hold the Blind Spot illustration about 16 inches from their face and close their left eye. Then have them concentrate their vision on the diamond at the top of the page and move the paper slightly until the large circle disappears. Next, have students repeat the process with the "X" at the bottom of the page.

Answer Key
1. The circle disappears because it aligns with your optic nerve—the eye's blind spot.
2. The missing portion of the line disappears.
3. People are not bothered by blind spots because they have two eyes. The visual system combines the two images into one. What is in one eye's blind spot is still seen by the other eye.

Discussion Questions
1. Are there other types of blind spots? *(Another literal "blind spot" is the driver's blind spot that is found in most cars. Figurative blind spots also exist. You may have an emotional blind spot in which you cannot see another's shortcomings.)*
2. How do you cope with these blind spots? *(When driving, make sure you identify the blind spot in your visibility. Then determine a way to compensate for it. With emotional blind spots, try to recognize that your emotions have blinded you and find a way to "see" past them.)*
3. The blind spot is a physical limitation of your eye's ability to see everything in front of it. What other physical limitations prevent you from sensing and perceiving the world around you? *(There are many physical limitations. Human eyes see only a limited range of colors. We cannot perceive colors in the infrared or ultraviolet wavelengths. Human ears can hear only a limited range of sound. Human touch is limited in its sensitivity as well.)*

Extension Activity
Sit in the driver's seat of a car. Fasten the seat belt and position the seat and mirrors in comfortable driving positions. Do not turn the car on. Ask a friend to walk slowly around the car, stopping each time you say stop. As your friend is walking, say stop each time he or she disappears from view. This will identify the blind spots for that vehicle. Repeat the process in two other vehicles. Are the blind spots the same in each vehicle?

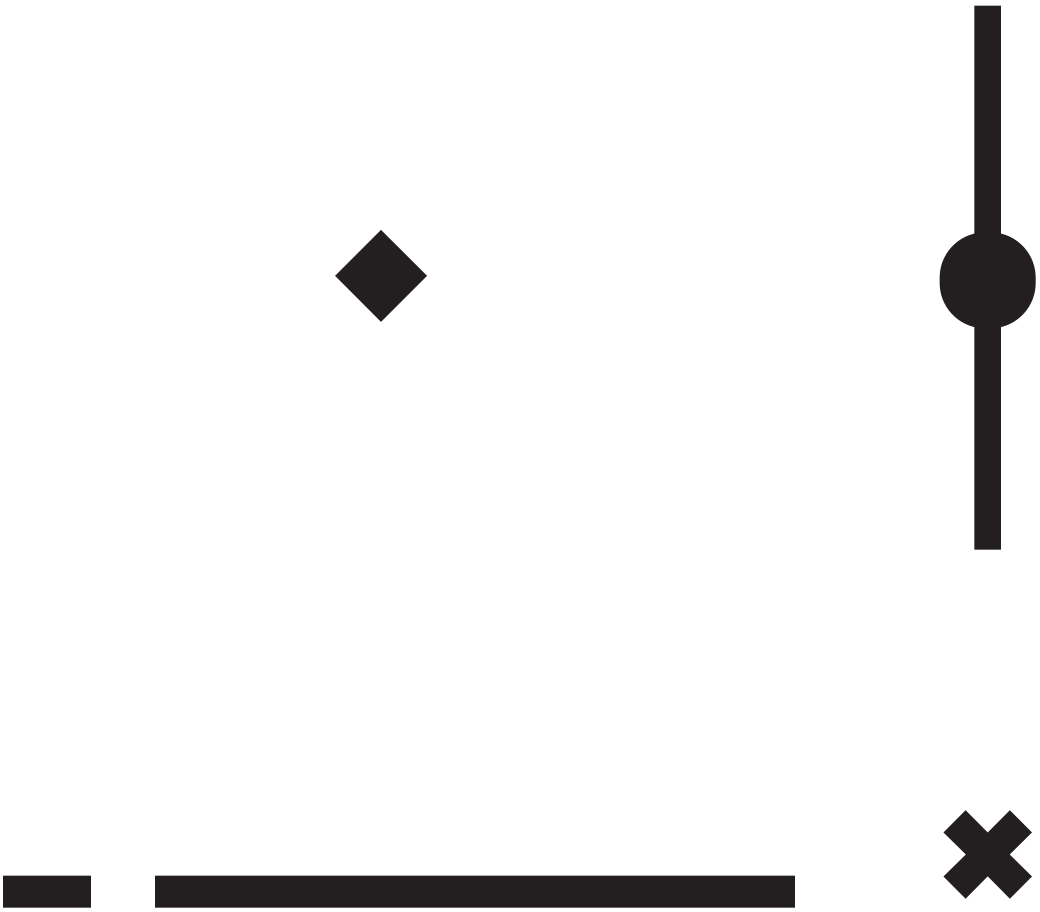
Name _____ Date _____ Class _____

STUDENT WORKSHEET

Application Activity 8

The Eye's Blind Spot

Directions: Hold the paper about 16 inches away from your face. Close your left eye. Concentrate your vision on the diamond and move the paper slightly toward you until the large dot in the vertical line disappears. Next, close your right eye. Concentrate your vision on the "X" at the bottom of the page. Move the paper toward you and note what happens to the gap in the line.



Drawing Conclusions

Directions: Answer the following questions on a separate sheet of paper.

1. Why does the dot disappear?
2. What did you notice about the missing portion of the line in the lower illustration?
3. Why are people not bothered by these blind spots?

Understanding Psychology

Chapter 8
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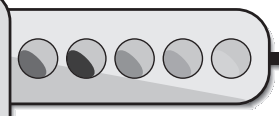
Vocabulary Activity 8-1



Sensation

Directions: Complete each sentence by writing the term that best completes the sentence.

absolute threshold
difference threshold
perception
psychophysics
sensation
signal-detection theory
Weber's law

1. The organization of information received through our senses is known as _____.
2. The _____ for vision is the ability to see a candle flame 30 miles away on a clear night.
3. Researchers study _____ to understand the relationship between sensory experiences and the stimuli that cause these experiences.
4. If a person is carrying a 40-pound backpack, _____ states that he or she will be less likely to notice a one-pound weight being added to the pack than a person who has the weight added to a five-pound pack.
5. When you come into a warm room after being outside in a cold wind, your skin experiences a(n) _____ as the warm air touches the skin.
6. The _____ describes the smallest change in a physical stimulus such as light or sound that can be detected half the time.
7. The _____ explains how you can hear your name spoken from across a crowded, noisy room.

Directions: Answer the following questions in the space provided.

8. Explain how Weber's law works, using the sense of hearing as an example.

_____

_____

_____

_____

9. Explain the difference between the absolute threshold and the difference threshold.

_____

_____

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 8-1

Sensation

For use with textbook pages 207–213

Directions: Filling in the Blanks Use your textbook to fill in the blanks using the words in the box.

absolute	**detection**	**receptors**
adaptation	**difference**	**senses**
change	**perception**	**stimulus**
competing	**range**	

What Is Sensation?

Any aspect of or change in the environment to which an organism responds is called a **1** _____. A sensation occurs any time a stimulus activates one of your **2** _____. A sensation may be combined with other sensations and your past experience to yield a **3** _____.

Threshold

The weakest amount of a stimulus required to produce a sensation is the **4** _____ threshold. Humans sense a somewhat limited **5** _____ of the physical phenomena in the everyday world.

Sensory Differences and Ratios

A just noticeable **6** _____ is the smallest increase or decrease in the intensity of a stimulus that a person can detect half the time. According to Weber's law, the larger or stronger the stimulus, the larger the **7** _____ required for a person to notice it.

Sensory Adaptation

8 _____ are most responsive to increases and decreases, to new events rather than ongoing, unchanging stimulation. Without sensory **9** _____, you would feel the constant pressure of the clothes on your body.

Signal-Detection Theory

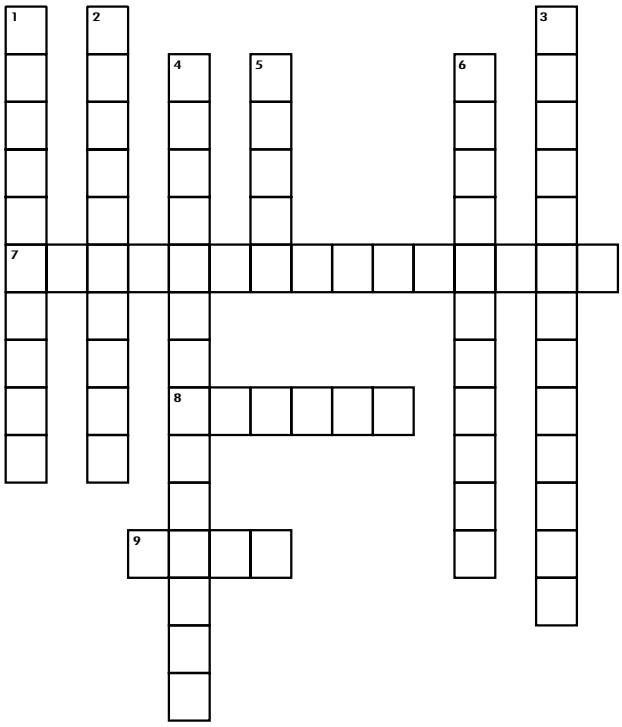
10 _____ thresholds involve recognizing some stimulus against a background of competing stimuli. Signal-detection theory is based on the notion that the stimulus must be detected in the presence of **11** _____ stimuli.

Name _____ Date _____ Class _____

Vocabulary Activity 8-2

The Senses

Directions: Use the following clues to complete the puzzle below, then answer the questions in the space provided.



DOWN

1. the system adjacent to the inner ear that controls balance
2. the nerve that carries impulses from the retina to the brain
3. the nerve that sends signals from the inner ear to the brain
4. the nerve that carries signals from the nose to the brain
5. the opening in the iris that controls the amount of light entering the eye
6. the sense of movement and body position

ACROSS

7. the combination of two images into one
8. the back of the eye that contains the light sensitive receptor cells
9. flexible transparent structure in the eye that focuses light on the retina

Directions: Answer the following questions in the space provided.

10. What is retinal disparity? Why is it important to your sense of sight?

_____

_____

Name _____ Date _____ Class _____

Guided Reading Activity 8-2

The Senses

For use with textbook pages 214–222

Directions: Recalling the Facts Use the information in your textbook to answer the questions.

1. How do sensory receptors make it possible for you to perceive external stimuli? _____

2. What are the differences between rods and cones? _____

3. Why does a pea look green? _____

4. Why do some people see the world in only blacks, whites, and shades of gray? _____

5. Why would you perceive one object as closer than another? _____

6. How would you describe the sound of a bass guitar at a rock concert in terms of sound waves? _____

7. How can your ears tell you from which direction a sound is coming? _____

8. If you experience dizziness while riding a roller coaster, what is likely occurring? _____

9. Why does food often taste bland when you have a cold? _____

10. How does feeling pain benefit you? _____

11. What process makes it possible to bounce a basketball without looking at it? _____

Name _____ Date _____ Class _____

Vocabulary Activity 8-3

Perception

Directions: Read each statement below and then write the letter of the correct answer in the space provided.

_____ **1.** A brief auditory or visual signal that occurs below the absolute threshold for that sense is known as a(n)

A. motion parallax. **C.** illusion.
B. subliminal message. **D.** extrasensory perception.

_____ **2.** The perception principle that assumes that the whole is greater than the sum of its parts is

A. constancy. **C.** Gestalt.
B. motion parallax. **D.** illusion.

_____ **3.** Perceiving information about the world through means other than the senses is known as

A. extrasensory perception. **C.** constancy.
B. illusion. **D.** Gestalt.

_____ **4.** Perceiving objects in the same way regardless of their distance, angle, or lighting is known as

A. extrasensory perception. **C.** constancy.
B. illusion. **D.** motion parallax.

_____ **5.** When you move your head from side to side or walk around, the apparent movement of stationary objects relative to one another is the

A. constancy cue. **C.** subliminal cue.
B. Gestalt cue. **D.** motion parallax cue.

_____ **6.** Misrepresentations of physical stimuli are known as

A. subliminal messages. **C.** illusions.
B. Gestalt messages. **D.** motion parallax.

Directions: Answer the following question in the space provided.

7. What Gestalt principles are commonly used to explain how perceptions are organized? Show an example of one of the principles.

Name _____ Date _____ Class _____

Guided Reading Activity 8-3

Perception

For use with textbook pages 223–231

Directions: Outlining Locate the heading in your textbook. Then use the information under the heading to help you write each answer.

I. Perception

A. Introduction

1. What occurs during the perception process? _____

_____

B. Principles of Perceptual Organization

1. Name four principles the brain uses in constructing perceptions. _____

_____

C. Figure-Ground Perception

1. What is figure-ground perception? _____

D. Perceptual Inference

1. What makes perceptual inference possible? _____

_____

E. Learning to Perceive

1. What factors influence learning to perceive? _____

_____

2. What would make a message subliminal? _____

_____

F. Depth Perception

1. What are some monocular cues used to perceive distance and depth? _____

_____

G. Constancy

1. What process produces size constancy? _____

H. Illusions

1. When are illusions created? _____

I. Extrasensory Perception

1. Name the four types of ESP. _____

_____

Answer Key

Chapter 6

Graphic Organizer Activity 6

THE THREE PARTS OF THE BRAIN		
Part of Brain: Hindbrain	**Includes These Structures:**	**Function of Each Structure:**
	Cerebellum	Controls posture and balance.
	Medulla	Controls breathing and a variety of reflexes.
	Pons	Bridge to interconnect messages between spinal cord and brain. Also involved in producing chemicals needed for sleep.
Location: At the rear base of the skull		
Part of Brain: Midbrain	**Includes These Structures:**	**Function of Each Structure:**
	RAS	Serves to alert the rest of the brain to incoming signals.
Location: Above the pons		
Part of Brain: Forebrain	**Includes These Structures:**	**Function of Each Structure:**
	Thalamus	Integrates sensory input.
	Hypothalamus	Controls hunger, thirst, and sexual behavior. Also controls body's temperature.
Location: Covers the brain's central core	Cerebral cortex	Ability to learn and store complex and abstract information and to project thinking into the future.
	Limbic system	Regulates emotions and motivations.

Critical Thinking Skills Activity 6

1. Fact. This has been demonstrated by scientific research.
2. Fact. This states facts determined from studying the mummified remains.
3. Opinion. This is the writer's personal opinion based on experience. The telltale clue is "It seems to me."
4. Fact. This statement of fact indicates what is known and what is still be to discovered.
5. Opinion. Galton was not able to prove his belief. (Note: Today we know that head size is not an accurate measure of the size of the brain. The clue is the word "believed.")
6. Opinion. No specific facts are cited. This is simply an appeal based on speculation that students learn better when all their senses are in action. The clue in the sentence is "It is my judgment."
7. Opinion. The fact that clients find the music helpful does not provide concrete evidence of fact. They could be experiencing a self-fulfilling prophecy.
8. Opinion. Research has not shown that men and women use different halves of the brain.
9. Fact. Research can prove this statement.
10. Opinion. This is the writer's personal belief. The clue words are "I think."

Reteaching Activity 6

1. somatic nervous system
2. neurons
3. midbrain
4. endocrine system
5. synapse
6. autonomic nervous system
7. pituitary gland
8. hindbrain
9. neurotransmitters
10. lobes
11. The thyroid gland is producing too much thyroxine and is said to be overactive.
12. The adrenal glands become active when a person is frightened and release epinephrine and norepinephrine into the bloodstream. These hormones generate extra energy needed to handle difficult situations.
13. Thalamus integrates sensory input, except smell.
14. Cerebral cortex gives you the ability to learn and process abstract information.
15. Cerebellum helps control posture and balance.
16. Hypothalamus controls basic biological functions such as hunger, thirst, body temperature, and sexual behavior.
17. Pons produces chemicals needed for sleep.
18. Medulla controls breathing and other reflexes.
19. Spinal cord is composed of nerves that transmit most messages between the body and the brain.
20. The summaries should explain the technology and offer some insight into how this new information or technology can lead to a better understanding of human behavior.

Enrichment Activity 6

1. The study supports this idea since it found that the IQ differences between twins reared apart and twins reared together were greater than the personality differences of the two groups.
2. **David and Dean Kopsell**
   Physical similarities: not known
   Personality similarities: same interests
   Intelligence similarities: same IQ, both earned doctorates in horticulture

   Harold and Bernard Shapiro
   Physical similarities: not known
   Personality similarities: neat, orderly, friendly, same interest in opera
   Intelligence similarities: both are university presidents

   Judith and Julie Swain
   Physical similarities: seem to have unlimited energy, athletic
   Personality similarities: workaholics, cat lovers, ambitious

Intelligence similarities: chairs of cardiology departments at universities

Richard and Robert Tenniswood
Physical similarities: had heart attacks on the same day while mowing their grass, the blockages in the arteries were nearly identical
Personality similarities: both machinists
Intelligence similarities: not known

Karen and Christine McEvoy
Physical similarities: world-class triathletes
Personality similarities: competitive
Intelligence similarities: not known

Jim Lewis and Jim Springer
Physical similarities: same physical characteristics, speak with same inflections, use same gestures, suffer from migraine headaches, have high blood pressure
Personality similarities: love stock car racing, hate baseball
Intelligence similarities: not known

Students may add information from identical twins they know.

3. Student answers will vary. Their reasoning should indicate their understanding of the interplay between heredity and environment.

Vocabulary Activity 6-1

1. A
2. C
3. D
4. B
5. C
6. D
7. A
8. Afferent neurons relay messages from the sense organs to the brain. Efferent neurons send signals from the brain to the glands and muscles. Interneurons process signals between neurons.

Guided Reading Activity 6-1

A.

1. "Runner's high" is a feeling of euphoria.
2. Endorphins, which are neurotransmitters, produce runner's high.

B.

1. The nervous system is made up of the central and peripheral nervous systems.
2. Nerves conduct information from the bodily organs to the central nervous system and take information back to the organs.
3. The skull and layers of sheathing protect the brain, vertebrae protect the spinal cord, and layers of sheathing protect the peripheral nerves.
4. The all-or-none principle states that when a neuron fires, it does so at full strength. If a neuron is not stimulated past the threshold level, it does not fire at all.
5. The four basic parts of a neuron are the cell body, dendrites, an axon, and axon terminals.
6. The myelin sheath insulates and protects the axon for some neurons and speeds the transmission of impulses.
7. Neurotransmitters are chemicals that carry impulses across the synapse between neurons. They can excite the next neuron or stop it from transmitting.
8. Afferent neurons relay messages from the sense organs to the brain. Efferent neurons send signals from the brain to the glands and muscles. Interneurons carry impulses between neurons.
9. The somatic nervous system controls voluntary activities. The autonomic nervous system controls involuntary activities, such as heartbeat.

Vocabulary Activity 6-2

1. hindbrain
2. computerized axial tomography (CT)
3. forebrain
4. magnetic resonance imaging (MRI)
5. electroencephalograph (EEG)
6. lobes
7. midbrain
8. positron emission tomography (PET)
9. The thalamus relays all information that travels to and from the cortex. The hypothalamus controls such functions as hunger, thirst, and sexual behavior. The outer layer of the forebrain is the cerebral cortex; it gives us the ability to learn and store complex information. The limbic system contains the brain's structures that regulate emotions and motivation.
10. They record the brain's activity using an EEG. They stimulate areas of the brain. They create lesions or cuts in experimental situations to study the effects. They use CT, PET, and MRI scans to create images of the brain.

Guided Reading Activity 6-2

1. cerebellum
2. medulla
3. pons
4. reticular activating system
5. thalamus
6. hypothalamus
7. cerebral cortex
8. limbic system
9. occipital lobe

10. right hemisphere
11. behavior
12. Brain waves
13. Electrodes
14. Magnetic resonance imaging

Vocabulary Activity 6–3

1. endocrine

(Note that the answers to items 2–5 may appear in any order.)

2. pituitary gland
3. thyroid gland
4. adrenal glands
5. sex glands
6. pituitary gland
7. near the midbrain and hypothalamus
8. hypothalamus
9. hormone
10. bloodstream
11. norepinephrine
12. The nervous system sends rapid, specific messages to the brain. The endocrine system sends slow, widespread communication to the brain.

Guided Reading Activity 6–3

1. The "rush" comes from the hormone adrenaline or epinephrine secreted by the endocrine system. The adrenal hormone declares an emergency situation to the body, requiring the body to become very active.
2. Like the nervous system, the endocrine system is a communication system for sending information to and from the brain.
3. Endocrine glands are also called "ductless glands" because they release hormones directly into the bloodstream.
4. Student answers should include three of the following: (1) Hormones affect the growth of bodily structures, affecting what you can do physically. (2) They affect metabolic processes, influencing the amount of energy you have. (3) Certain hormones cause the differences between boys and girls. (4) Other hormones prepare the body for action during stress. (5) Hormones also act in the brain to directly influence moods and drives.
5. The pituitary gland secretes a large number of hormones, many of which control the output of hormones by other endocrine glands.
6. Hypothyroidism is too little of the hormone thyroxine. This condition makes people feel lazy and lethargic.
7. The adrenal glands release epinephrine and norepinephrine into the bloodstream, causing the heartbeat and breathing to increase. These secretions and other changes help a person generate the extra energy needed to handle a difficult situation.
8. Ovaries produce eggs and the female hormones estrogen and progesterone.
9. In adolescence, testosterone is important for the growth of muscle and bone along with the growth of male sex characteristics.
10. A neurotransmitter is released right beside the cell that it is to excite or inhibit. A hormone is released into the blood, which diffuses it throughout the body.
11. The nervous system developed to send rapid and specific messages, while the other system, involving the circulatory system, formed to send slow and widespread communication. The chemical messengers in this second system evolved into hormones.

Vocabulary Activity 6–4

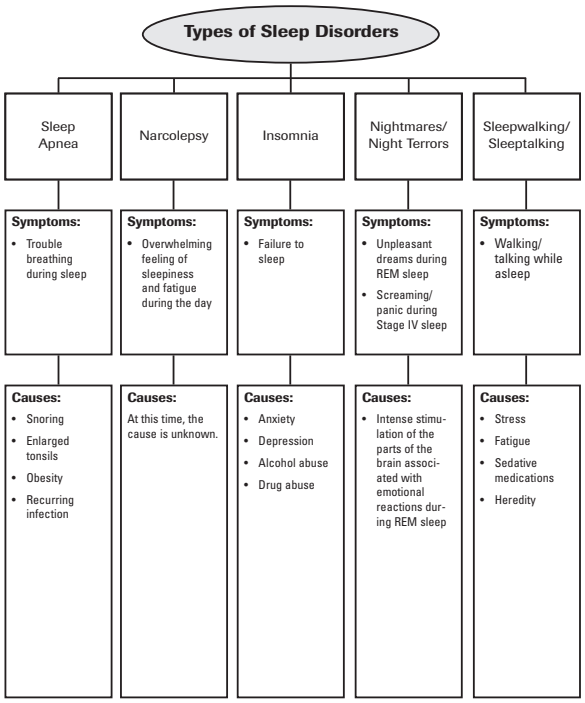
1. genes
2. fraternal twins
3. heredity
4. identical twins
5. Student answers will vary. An example is as follows. Psychologists have long wondered what part heredity and the environment play in human behavior. Most agree that both have significant influence. One way to sort out this question is to study identical twins, especially those who were separated at birth and grew up in different environments. New technologies allow researchers to study the genes of identical twins, fraternal twins, siblings, and their parents to identify similarities and differences that may affect behavior.

Guided Reading Activity 6–4

1. Genes
2. environment
3. instinctive
4. learned
5. Heredity
6. nurture
7. nature
8. Sir Francis Galton
9. John Watson
10. behavior
11. Identical twins
12. monozygotic
13. Fraternal twins
14. dizygotic

Chapter 7

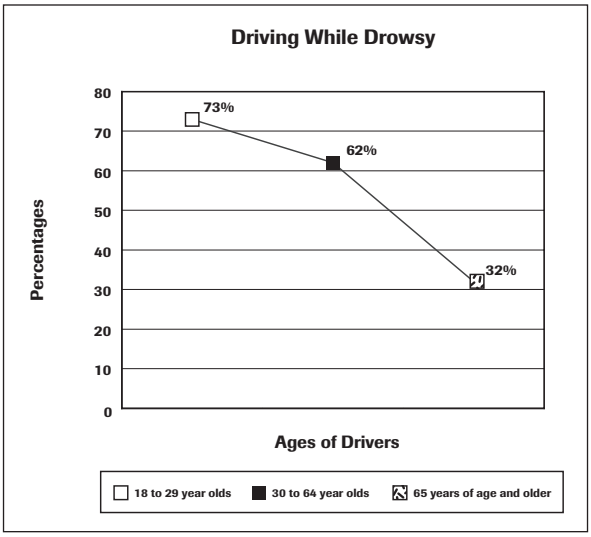
Graphic Organizer Activity 7



Critical Thinking Skills Activity 7

1. Marijuana shows the lowest usage at all grade levels.
2. The percentage of students in each grade who have tried marijuana, alcohol, and cigarettes increases from 8th to 12th grades.
3. Cigarette usage in all grade levels has been in steady decline since 1999. Answers will vary as to the reason for this decline, but students may state that antismoking public service campaigns have played a major role.

The second part of this activity asks students to create a line and a bar graph using statistics on the percentage of drivers who have driven while drowsy. The graphs should have a title and the axes should be clearly labeled. See the sample graphs presented here.



Reteaching Activity 7

1. D
2. J
3. A
4. G
5. B
6. F
7. K
8. E
9. H
10. L
11. Stage I: lightest level of sleep, pulse slows, muscles relax, breathing and brain waves become irregular
12. Stage II: characterized by low-amplitude, high-frequency brain waves, eyes roll from side to side
13. Stage III: large amplitude delta waves
14. Stage IV: deepest sleep; large, regular delta waves; sleepwalking, talking aloud, and bed-wetting all occur during this stage of sleep; important to physical and psychological well-being
15. REM sleep: characterized by rapid eye movement, when dreaming occurs, pulse and heart rate become irregular, face or fingers twitch, large muscles paralyzed
16. Hypnosis is an altered state of consciousness in which people become highly suggestible to changes in behavior and thought. Hypnosis allows the person to become aware of things that he or she usually does not notice. Hypnotized people can focus intently on specific internal or external stimuli.
17. Hypnosis is not a state of being asleep. Hypnosis does not cause you to do things you otherwise would not do.
18. Hypnosis may be used to entertain or intrigue. Hypnosis may also be used medically or

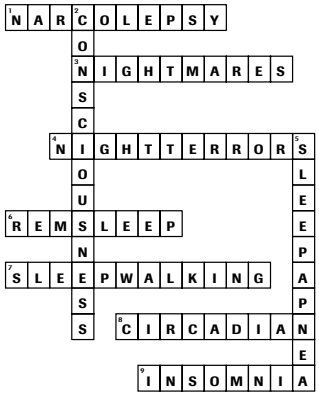
therapeutically. Such applications include helping athletes achieve peak performance.

19. B, F
20. A, D, F, G
21. C, E, H

Enrichment Activity 7

1. Student answers will vary. Hypnosis may prove helpful to him and should be considered as a possible treatment option.
2. Students' time lines will vary. They should accurately represent time spans and show major events, dates, and people involved.
3. The reports should indicate how the athlete uses hypnosis, what form of hypnosis is used, and what led the athlete to try hypnosis.

Vocabulary Activity 7–1



1. narcolepsy
2. consciousness
3. nightmares
4. night terrors
5. sleep apnea
6. REM sleep
7. sleep walking
8. circadian
9. insomnia
10. No one knows the reason we dream. Theories include: (a) dreams have hidden meanings that reveal our unconscious thoughts; (b) dreams have no purpose; (c) dreams serve as a problem-solving tool; and (d) dreams are a way of removing unneeded memories.

Guided Reading Activity 7–1

1. Sleep is a state of altered consciousness, characterized by certain patterns of brain activity.
2. Student answers should contain three of the following: (1) Some people believe that sleep is restorative, allowing the brain to recover from exhaustion and stress. (2) Other people believe it is a type of primitive hibernation to conserve energy. (3) Some suggest that sleep is an adaptive process to keep humans out of harm's way at night. (4) Still others believe we sleep to clear our minds of useless information. (5) Some people believe we sleep to dream.
3. In Stage I sleep, a person's pulse slows a bit more and muscles relax, but breathing becomes uneven and brain waves grow irregular. This phase lasts for about 10 minutes and is marked by the presence of theta waves.
4. REM sleep is characterized by rapid eye movements. Pulse rate and breathing become irregular, and levels of adrenal and sexual hormones in the blood rise. The face and fingers often twitch and the large muscles in arms and legs are paralyzed. Almost all dreaming takes place during REM sleep.
5. Jet lag occurs when your internal circadian rhythms do not match the external clock time. You may feel tired and disoriented. It usually takes about one day for each hour of time change to reset your circadian clock.
6. Student answers should include five of the following: insomnia, sleep apnea, narcolepsy, nightmares, night terrors, sleepwalking, and sleep talking.
7. Sleep apnea is caused by a blockage of the breathing passages usually due to a physical problem, such as enlarged tonsils, repeated infections in the throat or middle ear, or obesity.
8. Nightmares occur during the dream phase of REM sleep, and the sleeper usually wakes up with a vivid memory of a dream. Night terrors occur during Stage IV sleep and subjects usually have no memory of them.
9. The first few dreams are usually composed of vague thoughts left over from the day's activities. As the night wears on, dreams become longer and more vivid and dramatic. The last dream is likely to be the longest.
10. Freud believed that dreams may contain clues to thoughts and desires the dreamer is afraid to acknowledge or express during waking hours. He maintained that dreams are full of hidden meanings and disguises.

Vocabulary Activity 7–2

1. B
2. A
3. D
4. B
5. C
6. C
7. A
8. B
9. D
10. A
11. Hypnosis may be used as entertainment, to enhance memories, to manage pain, to reveal problems, and to change unwanted behaviors.

Guided Reading Activity 7-2

A.

1. Some operations have been performed using hypnosis instead of anesthesia.

B.

1. Hypnosis is a form of altered consciousness in which people become highly suggestible to changes in behavior and thought.
2. At all times, certain sensations and thoughts are filtered out of our awareness. Hypnosis shifts our perceptions to make us aware of things we usually filter out or make us unaware of things we usually notice.
3. A hypnotist cannot force the participant to do something against his or her will. The participant is cooperating with the hypnotist, rather than being under the hypnotist's control.
4. The neodissociation theory holds that consciousness includes many different aspects that may become separated, or dissociated, during hypnosis. It includes a "hidden observer"—a portion of the personality that watches and reports what happens to the hypnotized person.
5. Hypnosis may be used to suppress or aid memory. It can help change unwanted behaviors, re-duce pain, and help clients reveal their problems to therapists or gain insight into their lives.

C.

1. Biofeedback has been used to teach people to control a wide variety of physiological responses.
2. The basic principle of biofeedback is that feedback makes learning possible.

D.

1. People can change their physiological states through meditation. Researchers generally agree that most people can benefit from the sort of systematic relaxation that meditation provides.

Vocabulary Activity 7-3

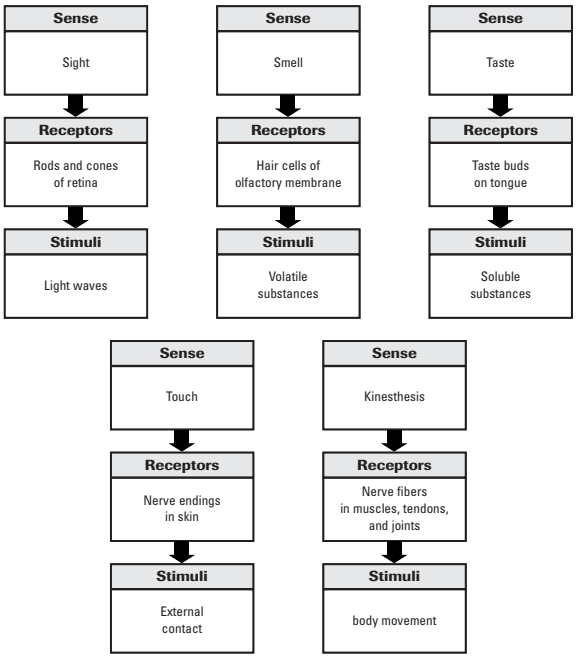
1. Marijuana
2. Hallucinations
3. Psychoactive drugs
4. LSD
5. hallucinogens
6. A person may experience intense and rapidly changing perceptions. Perceptual hallucinations are common. Dissociation of the self and distortions of time are also common. LSD impairs thinking although users believe they are thinking more clearly.
7. The categories are depressants (alcohol), tranquilizers (barbiturates), opiates (heroin), stimulants (caffeine), mixed stimulant-depressants (nicotine), distortion of experience (marijuana), and hallucinogens (LSD).

Guided Reading Activity 7-3

1. physically
2. psychologically
3. augments
4. memory
5. perceptions
6. dreaming
7. plants
8. synthetic
9. narcotics
10. breathing
11. alcohol
12. depressant
13. inhibit
14. abusers
15. control

Chapter 8

Graphic Organizer Activity 8



Critical Thinking Skills Activity 8

Students' experiments will vary. Remind students that your evaluation will focus on the quality of the work, not on the outcomes of the experiment.

Evaluate the students' abilities to form a hypothesis, design an experiment to test the hypothesis, conduct the experiment using that design, analyze the results, and then write the report.

Reteaching Activity 8

1. pupil
2. vestibular
3. sensation
4. Kinesthesis
5. Illusions
6. Gestalt
7. optic nerve
8. psychophysics
9. retina
10. Constancy
11. olfactory
12. Perception
13. lens
14. constancy
15. extrasensory perception
16. depth perception
17. perceptual inference
18. subliminal perception
19. illusion
20. figure-ground perception
21. rods and cones; sight; light waves
22. nerve fibers in muscles; kinesthesis; raising your hand, walking, and so on
23. taste buds; taste; salt, sugar, and so on
24. hair cells of semicircular canals and vestibule; vestibular sense; gravity and motion
25. hair cells of olfactory membrane; smell; any scented substance

Enrichment Activity 8

1. In reality, the two center circles are the same shade, although the one on the left appears to be darker.
2. Perception of the center circles is affected by the shade of the outer circles.
3. This example should show students that the accuracy of our perceptions can be affected by other sensory information. Like all illusions, this shows that in one sense, our perceptions can be faulty. Some psychologists would, however, argue that perceptions are reality; therefore, the left circle is darker than the right one.
4. Humans distinguish shapes by concentrating the points where the angles of the object change.
5. Students will propose different theories about how perception is aided by experience. The Gestalt principles such as closure and continuity are learned through experience.
6. Students' puzzles will vary. Recommend that they stick with simple shapes with clear angles.

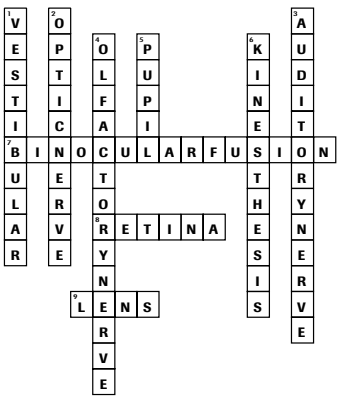
Vocabulary Activity 8-1

1. perception
2. absolute threshold
3. psychophysics
4. Weber's law
5. sensation
6. difference threshold
7. signal-detection theory
8. Student answers will vary. An example is as follows. A person sitting in a quiet room would notice a small percentage increase in the volume of sound outside the room more readily than a person at a noisy mall would notice the same percentage increase in volume.
9. The absolute threshold for a sensation is the smallest amount of a stimulus that a person can perceive. It starts from a point of no stimulus. The difference threshold measures the smallest change in a stimulus that can be detected. It assumes that the stimulus, for example sound or light, is already present.

Guided Reading Activity 8-1

1. stimulus
2. receptors
3. perception
4. absolute
5. reality
6. difference
7. change
8. Senses
9. adaptation
10. Detection
11. competing

Vocabulary Activity 8-2



1. vestibular
2. optic nerve
3. auditory nerve
4. olfactory nerve
5. pupil
6. kinesthesis
7. binocular fusion
8. retina
9. lens
10. Retinal disparity is the fact that your two eyes see slightly different images. It is essential to your sense of depth perception.

Guided Reading Activity 8-2

1. Each type of sensory receptor converts some sort of external stimulus into a chemical-electrical message that can be transmitted by the nervous system and interpreted by the brain.
2. Cones require more light than rods before they begin to respond, so they work best in daylight. Rods require less light, so they are the basis for night vision. There are more rods than cones, but only cones are sensitive to color.
3. A pea looks green because it reflects green light and absorbs all the other colors.
4. People who see the world only in black, white, and shades of gray have cones that do not function properly. They must depend on their rods, which are not sensitive to color.
5. You would have a larger retinal disparity for the closer object than for the object that is farther away. The brain interprets a large retinal disparity to mean that an object is nearby.
6. Loudness is determined by the height of sound waves. The higher the waves, the louder the sound. Since the guitar is playing at a rock concert, it is likely producing relatively high waves. Since it is a bass guitar, it is probably producing waves of relatively low rates of vibration.
7. Sound will reach the closest ear first and will be slightly louder in that ear. These differences tell you from which direction the sound is coming.
8. The extreme movements of the roller coaster are likely overstimulating your vestibular sense, causing dizziness.
9. Much of what is referred to as taste is actually produced by the sense of smell. When your sense of smell is hindered by a stuffed-up nose, your sense of taste is diminished.
10. Pain alerts you to the possibility of injury to bodily tissues. It is an emergency system that motivates you to take care of injuries or stop harmful activities.
11. Receptors in and near the muscles, tendons, and joints send messages to the brain when movement occurs near them. These kinesthetic sensations make it possible to coordinate movements, such as bouncing a basketball without looking at it.

Vocabulary Activity 8-3

1. B
2. C
3. A
4. C
5. D
6. C
7. The principles are proximity, similarity, closure, continuity, and simplicity. Students' examples will vary. Use Figure 8.12 in the student text as a model.

Guided Reading Activity 8-3

A.

1. During the perception process, the brain receives information from the senses and organizes and interprets it into meaningful experiences—unconsciously.

B.

1. The brain uses the principles of proximity, continuity, similarity, and closure in organizing patterns.

C.

1. Figure-ground perception is the ability to discriminate properly between figure and ground, that is, to perceive an object as standing out from its background.

D.

1. Perceptual inference often depends on experience, but we are probably born with some ability to make perceptual inferences.

E.

1. Active involvement in our environment and our needs, beliefs, and expectations influence learning to perceive.
2. A message would be subliminal if it were presented below the absolute threshold.

F.

1. Monocular depth cues include relative height, interposition, light and shadows, texture-density gradient, motion parallax, linear perspective, and relative motion.

G.

1. Distance information compensates for the changing eye image to produce size constancy. If information about distance is eliminated, your perception of the size of an object begins to correspond to the actual size of the eye image.

H.

1. Illusions are created when perceptual cues are distorted so that our brains cannot correctly interpret space, size, and depth cues.

I.

1. The four types of ESP are clairvoyance, telepathy, psychokinesis, and precognition.