

Chapter 20 The Nervous System

Study Guide

1. How the Nervous System Works
 - a. Jobs of the Nervous System
 - i. Receiving Information
 - ii. Responding to Information
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 2. **Response**
 - iii. Maintaining Homeostasis
 - b. The **Neuron** – A Message-Carrying Cell
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 - iii. Kinds of Neurons
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 2. **Cerebellum and Brainstem**
 - ii. **The Spinal Cord**
 - b. **The Peripheral Nervous System**
 - i. Two-Way Traffic
 - ii. **Somatic and Autonomic Systems**
 - c. **Reflexes**
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i. **Concussion**

3. **The Senses**

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i. **How Light Enters Your Eye**

1. **Cornea**

2. **Pupil**

3. **Iris**

ii. **How Light Is Focused**

1. **Lens**

iii. **How You See an Image**

1. **Retina**

b. **Correcting Vision Problems**

i. **Nearsightedness**

ii. **Farsightedness**

c. **Hearing**

i. **How Sound is Produced**

ii. **Sound Vibrations and the Ear**

1. **Eardrum**

iii. **How You Hear**

1. **Cochlea**

d. **Your Sense of Balance**

i. **Semicircular Canals**

e. **Smell and Taste**

f. **Touch**

4. **Alcohol and Other Drugs**

a. **Medicines**

b. **Drug Abuse**

i. **Immediate Effects of Abused Drugs**

ii. **Tolerance**

iii. **Addiction**

1. **Withdrawal**

c. **Other Effects of Drug Abuse**

- d. Kinds of Drugs
 - i. **Depressants**
 - ii. **Stimulants**
 - iii. **Anabolic Steroids**
- e. Alcohol
 - i. How Alcohol Affects the Body
 - ii. Long-Term Alcohol Abuse
 - 1. **Alcoholism**
 - iii. Avoiding Drugs and Alcohol

How the Nervous System Works

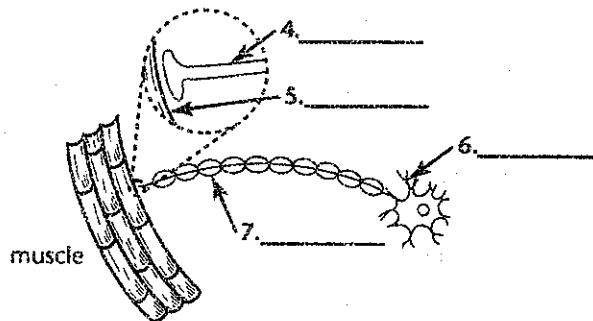
◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. What are three main functions of the nervous system? Give an example of each.
2. What are the three kinds of neurons? How do they work together to produce a response to an environmental stimulus? Use an example in your explanation.
3. How does a message travel across a synapse?

◆ Building Vocabulary

Label the diagram below with axon, axon tip, dendrite, and synapse.



Fill in the blank to complete each statement.

8. A(n) _____ is what your body does in reaction to a stimulus.
9. A bundle of nerve fibers is called a(n) _____.
10. The message that a neuron carries is called a(n) _____.
11. Any change or signal in the environment that can make an organism react is a(n) _____.
12. A cell that carries information through your nervous system is called a(n) _____.

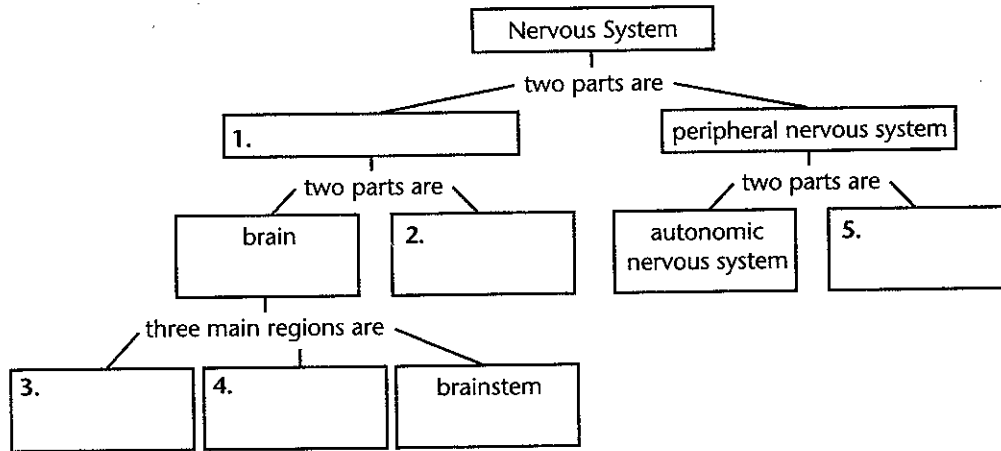
SECTION 20-2

REVIEW AND REINFORCE

Divisions of the Nervous System

◆ Understanding Main Ideas

For items 1–5, complete the following concept map.



Answer the following questions on a separate sheet of paper.

6. What is the function of the central nervous system?
7. What is the peripheral nervous system and what is its function?
8. What is the function of the somatic nervous system?
9. What is the function of the autonomic nervous system?

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

- | | |
|-----------------------|---|
| _____ 10. spinal cord | a. the part of the brain that controls the body's involuntary activities |
| _____ 11. reflex | b. the part of the brain that interprets input from the senses, controls the movement of skeletal muscles, and carries out complex mental processes |
| _____ 12. cerebellum | c. a bruiselike injury of the brain |
| _____ 13. concussion | d. an automatic response that occurs very rapidly and without conscious control |
| _____ 14. brain | e. the part of the central nervous system that controls most body functions |
| _____ 15. brainstem | f. the part of the brain that coordinates the actions of your muscles and helps you keep your balance |
| _____ 16. cerebrum | g. a thick column of nerve tissue |

SECTION 20-3

REVIEW AND REINFORCE

The Senses

◆ Understanding Main Ideas

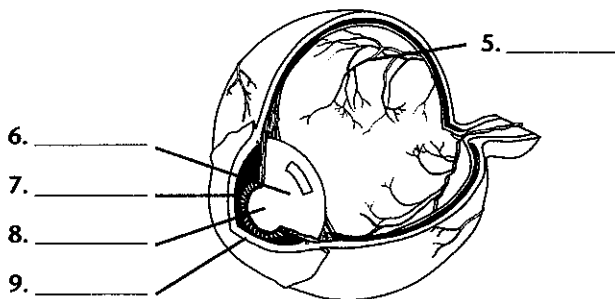
Answer the following questions on a separate sheet of paper.

1. How do we see? In your explanation, describe the parts of the eye and the path of light through the eye.
2. Compare and contrast the senses of taste and smell.
3. How do we hear? In your explanation, describe the parts of the ear and path of sounds through the ear.
4. How is the sense of touch similar to the other senses? How is it different?

◆ Building Vocabulary

From the list below, label the diagram.

- | | | |
|--------|--------|------|
| cornea | pupil | iris |
| lens | retina | |



Fill in the blank to complete each sentence.

10. The _____ contains receptors that convert sound vibrations to impulses that are sent to the brain.
11. People with _____ can see nearby objects clearly but cannot see objects far away clearly.
12. People with _____ can see objects in the distance clearly but cannot see nearby objects clearly.
13. The _____ is a membrane in the ear that vibrates when sound waves strike it.
14. Each _____ in your inner ear helps you maintain your sense of balance.

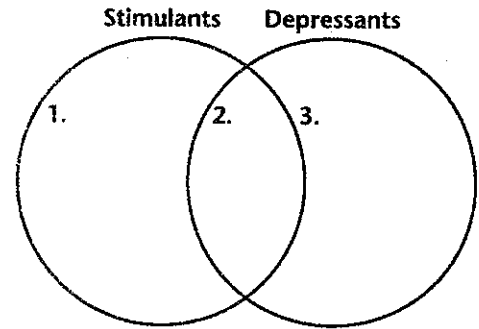
SECTION 20-4 REVIEW AND REINFORCE

Alcohol and Other Drugs

◆ Understanding Main Ideas

For items 1–3, complete the following Venn diagram by writing the letter of each characteristic in the correct section.

- a. slow down the central nervous system
- b. can be abused
- c. include alcohol and heroin
- d. speed up body processes
- e. act on the nervous system
- f. include caffeine and nicotine



Answer the following in the spaces provided.

4. How are drugs and medicines related?

5. What are some of the common effects of long-term abuse of alcohol?

◆ Building Vocabulary

Write a definition for each of the following terms on the lines below.

6. drug abuse _____

7. alcoholism _____

8. tolerance _____

9. withdrawal _____

10. anabolic steroid _____

Name: _____

Class: _____

Choose the letter of the correct answer.

1. BAC is a measurement of
[A] the concentration of alcohol in the blood.
[B] the number of alcohol deaths in a state.
[C] how long a person has been drinking alcohol.
[D] how fast a person reacts after drinking alcohol.
2. What is the most common cause of spinal cord injuries?
[A] contact sports [B] bicycling without a helmet [C] car crashes [D] skating
3. What part of the brain controls memory?
[A] cerebellum [B] cerebrum [C] brainstem [D] spinal cord
4. In some reflex actions, skeletal muscles contract without the involvement of
[A] the brain. [B] motor neurons. [C] interneurons. [D] the spinal cord.
5. What produces sound?
[A] vibrating material [B] light waves [C] rods and cones [D] chemicals in the air
6. If the semicircular canals are damaged, which sense will be affected?
[A] balance [B] touch [C] hearing [D] smell
7. A spinal nerve is made of
[A] interneurons only.
[B] sensory neurons only.
[C] both interneurons and motor neurons.
[D] both sensory neurons and motor neurons.
8. Suppose that you close a window because you notice that rain is falling. Your action in closing the window is a(n)
[A] involuntary reaction. [B] stimulus. [C] depressant. [D] response.
9. Cone cells enable you to see
[A] nearby objects. [B] at night. [C] colors. [D] black and white.

Choose the letter of the correct answer.

10. When drug addicts stop using a drug, they may experience withdrawal because
 - [A] they have been infected by HIV.
 - [B] the drug has damaged their kidneys.
 - [C] their bodies have become physically dependent on the drug.
 - [D] the drug has made them nervous.

11. The senses of smell and taste both depend on
 - [A] waves.
 - [B] chemicals.
 - [C] the semicircular canals.
 - [D] the optic nerve.

12. What is the function of the brainstem?
 - [A] controlling involuntary processes such as breathing
 - [B] receiving input from the senses
 - [C] protecting the cerebrum
 - [D] coordinating the actions of muscles

Fill in the word or phrase that best completes the statement(s).

13. The part of the brain that controls balance is the _____.

14. The peripheral nervous system consists of _____ that link the central nervous system with all parts of the body.

15. The part of the brain that controls thinking, speaking, and hearing is the _____.

16. Spinal cord injuries can result in _____, which is the loss of the ability to move some part of the body.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

17. A reflex is an involuntary response that occurs very rapidly.

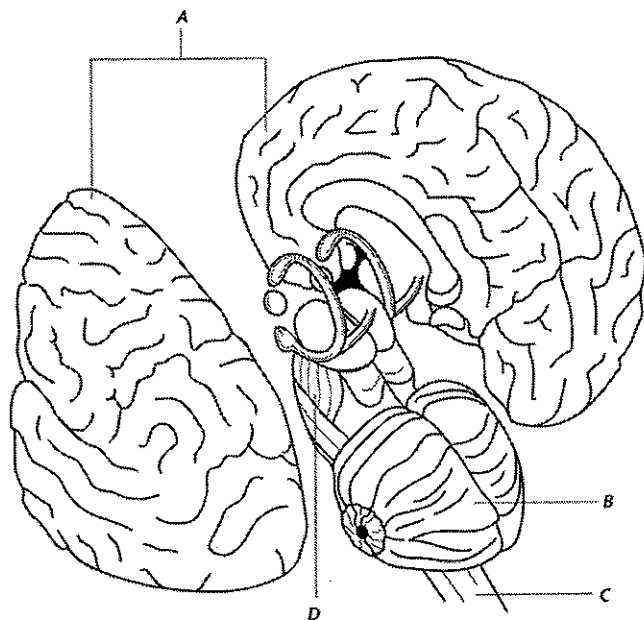
18. The peripheral nervous system is composed of the brain and the spinal cord.

19. An axon carries impulses toward the nerve cell body.

20. The body's reaction to a change in the environment is a response.

Use the diagram to answer the question(s).

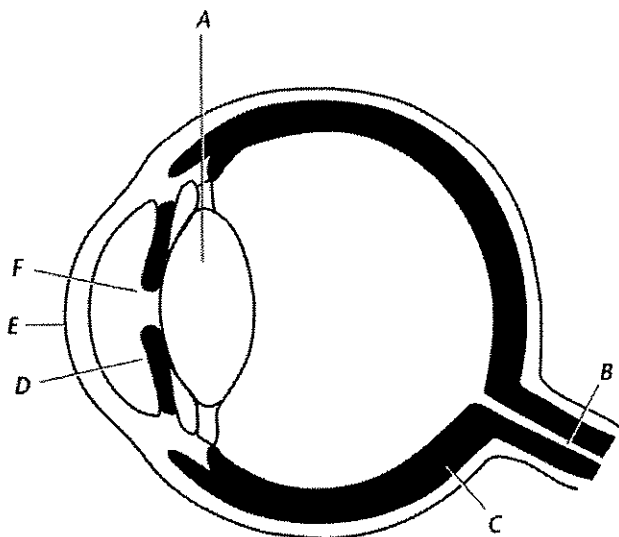
The Brain



21. What part of the brain is indicated by D? What is its function?
22. What part of the central nervous system is indicated by C? What is its function?

Use the diagram to answer the question(s).

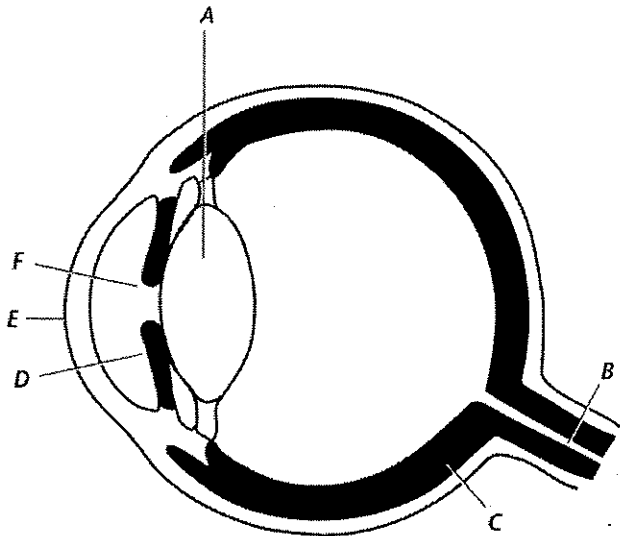
The Eye



23. Identify structure B. Explain what would happen if this structure were damaged.
24. Identify structure E and describe its function.

Use the diagram to answer the question(s).

The Eye



25. Identify structure C and describe its function.
26. When images focus in front of structure C, what condition results? How does this condition affect people's vision?

Write an answer to the following question(s).

27. Name the two divisions of the peripheral nervous system and explain the difference between the functions of the two divisions.
28. Describe the process by which a person hears a sound. Begin with sound waves entering the ear and end with nerve impulses reaching the brain.
29. Name the main sense organs and the stimulus to which each responds.
30. Explain what farsightedness is and what causes it.