

Name: _____ Date: _____ Per: _____

CP Biology – Chapter 29 & 31 Assignment Packet

Many of these assignments will be completed in class; homework will be to review the notes online and to finish any work not finished during class time. On the day of the test, you will turn in your assignment packet.

[illegible]



Name _____

SECTION
29.1

HOW ORGAN SYSTEMS COMMUNICATE
Power Notes

Period _____

Date _____

A stimulus is _____

	Endocrine System	Nervous System
Is made up of		
Rate of communication		
Types of signals		
Examples of processes controlled		
Divisions	NONE	

#2



Name _____

SECTION
29.1

HOW ORGAN SYSTEMS COMMUNICATE

Reinforcement

Period _____

Date _____

KEY CONCEPT The nervous system and the endocrine system provide the means by which organs systems communicate.

The nervous system and the endocrine system help the body maintain homeostasis. Both systems can do this because they provide the means by which all other body systems communicate. These systems detect a **stimulus**, something that causes a response, and produce responses that help keep the body's internal conditions stable.

The **nervous system** is a highly connected network of tissues that allows you to think, move, sense your internal and external environment, and stimulate other organs. The nervous system uses chemical and electrical signals that allow it to work quickly. It has two parts:

- The **central nervous system (CNS)** is the part of the nervous system that contains the brain and spinal cord.
- All of the nerves that branch out from CNS form the **peripheral nervous system (PNS)**. The nerves of the PNS connect the CNS to the rest of the body.

The **endocrine system** consists of isolated organs that are connected only by the bloodstream. These organs produce chemical signals that control slow processes such as growth, development, or digestion.

1. What is a stimulus?

2. How do the nervous system and the endocrine system help the body maintain homeostasis?

3. How are the two parts of the nervous system different?

4. What are three differences between the nervous system and the endocrine system?

C#

29.1 Reading Guide

KEY CONCEPT

The nervous system and the endocrine system provide the means by which organ systems communicate.

VOCABULARY

nervous system	central nervous system (CNS)
endocrine system	peripheral nervous system (PNS)
stimulus	

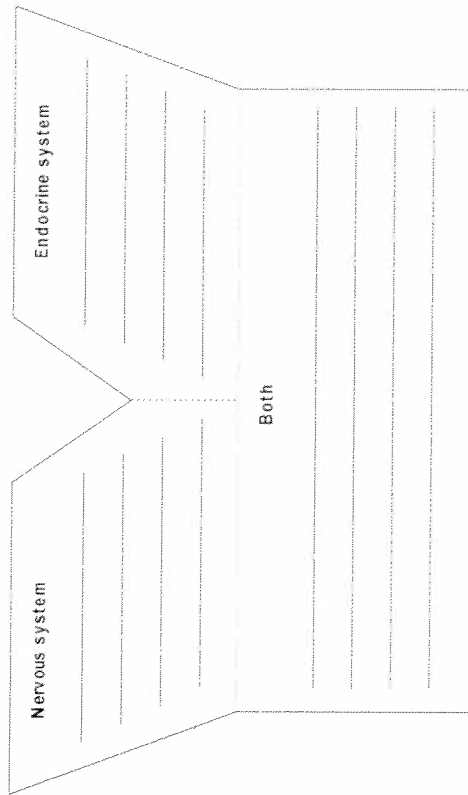
MAIN IDEA: The body's communication systems help maintain homeostasis.

1. What is homeostasis?
2. How do communication systems allow the body to maintain homeostasis?

You work for a new kind of textbook company, one whose textbooks are actually comic books! Using the boxes provided, create a comic strip that shows an example of how a stimulus causes the human body to respond. (If you can't come up with an example, use the one in the text that describes how your eyes respond to bright sunlight.)

MAIN IDEA: The nervous and endocrine systems have different methods and rates of communication.

Fill out the Y diagram below. In the top left, write the characteristics of the nervous system. In the top right, write the characteristics of the endocrine system. At the bottom, write the characteristics the two systems have in common. Then, lightly cross out those characteristics at the top.



Vocabulary Check

Use the vocabulary terms from this section to complete the following sentences.

3. When you stand on a street corner, you jump when you hear a nearby truck honk its horn. In this example, the honking horn is the _____.
4. The _____ sends chemical signals through the bloodstream.
5. When your brain wants to make your legs move so that you can run, the _____ carries the message from your spinal cord to your leg muscles.
6. Your _____ is the communication system that sends its signals through a highly connected network of specialized cells and tissues.



Name _____

SECTION
29.2

NEURONS

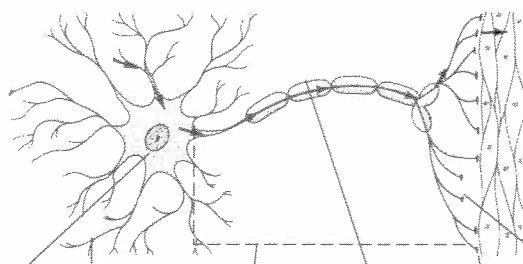
Power Notes

Period _____

Date _____

Part and Function

1.	
2.	
3.	
4.	
5.	
6.	



Signal Transmission

Resting Potential
Definition:
Details:
Action Potential
Definition:
Details:
Neurotransmitters
Definition:
Details:

Name _____

SECTION
29.2

NEURONS

Reinforcement

Period _____

Date _____

KEY CONCEPT: The nervous system is composed of highly specialized cells.

Neurons are the cells of the nervous system. These cells have a unique shape that allows them to receive signals from other neurons and pass these signals long distances in the body. Neurons have three parts: a cell body, dendrites, and a long axon.

- **Dendrites** are the short, branching structures that receive signals.
- The **axon** is a long extension down which electrical impulses travel.

In general, there are three types of neurons.

- Sensory neurons are part of the peripheral nervous system (PNS). These neurons detect stimuli and bring signals to the central nervous system (CNS).
- Interneurons are found in the CNS. They transmit and process signals in the brain and spinal cord.
- Motor neurons are those in the PNS that produce responses by taking messages from the CNS and bringing them to a muscle or organ.

A signal that travels down an axon is an electrical impulse called an **action potential**. The action potential is generated when a stimulus causes positively charged ions to diffuse into the neuron. As ions diffuse in, a small section the neuron's axon becomes positively charged, and more ions diffuse into the cell farther down the axon.

When the action potential reaches the end of the axon, also called the **terminal**, the impulse must be transferred to the next neuron. But, because neurons are not physically connected, the electrical signal must be changed to a chemical one. **Neurotransmitters** are the chemicals that are released into the space, also called the **synapse**, between neurons. The neurotransmitters bind to receptors on the next neuron's membrane. Then the next neuron generates another action potential.

1. What part of the neuron receives signals?

2. To what part of the nervous system do motor neurons and sensory neurons belong?

3. What is the electrical impulse that moves down an axon called?

4. What are the chemical signals that allow one neuron to stimulate another?

5. When is an impulse an electrical signal?

#5

5#



Name _____

Period _____

Date _____

SECTION 29.2 NEURONS

Reading Guide

KEY CONCEPT

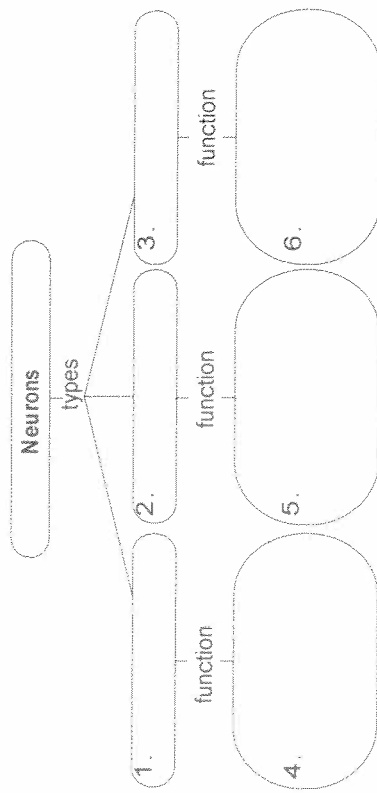
The nervous system is composed of highly specialized cells.

VOCABULARY

neuron	action potential
dendrite	synapse
axon	terminal
resting potential	neurotransmitter
sodium-potassium pump	

MAIN IDEA: Neurons are highly specialized cells.

Use the concept map to organize your notes on neurons.



7. What is the difference between the function of an axon and a dendrite?

Name _____

Period _____

Date _____

READING GUIDE, CONTINUED

MAIN IDEA: Neurons receive and transmit signals.

8. What is the role of the sodium-potassium pump?

9. Draw a picture to match each of the captions in the table. In the third column, write additional details about what is happening in each of your drawings.

Caption	Drawing	Description
The neuron is stimulated and Na ⁺ ions flow into the axon.		
The action potential travels down the axon as more Na ⁺ ions enter and K ⁺ ions leave.		
Neurotransmitters enter the synapse and bind to receptors on another neuron, stimulating Na ⁺ ions to enter		

10. What happens after neurotransmitters bind to the other neuron's receptors?

Vocabulary Check

11. the molecule that transmits a signal from one neuron to another
12. a gap between neurons
13. end of an axon
14. moving electrical impulse

#6

#9



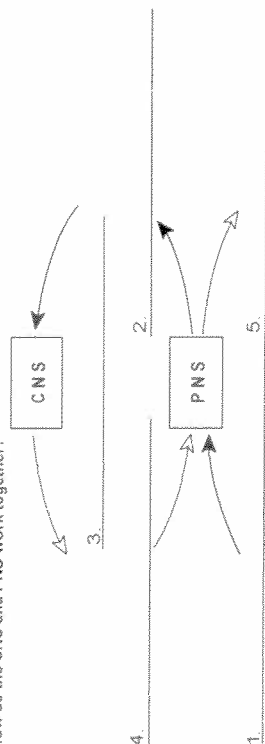
Name _____

Period _____

Date _____

SECTION 29.4 CENTRAL AND PERIPHERAL NERVOUS SYSTEMS
Power Notes

How do the CNS and PNS work together?



L#

SECTION 29.4 CENTRAL AND PERIPHERAL NERVOUS SYSTEMS
Reinforcement

KEY CONCEPT The central nervous system interprets information, and the peripheral nervous system gathers and transmits information.

The central and peripheral nervous systems work together to interact with the environment. Every time you get information from the world around you, it is your peripheral nervous system (PNS) that gathers information. Then, your central nervous system (CNS) interprets the information and decides on a response. Before you can respond, however, the CNS must send a signal to another nerve of the PNS. It is this PNS nerve that stimulates the muscle or organ to cause a response.

The CNS consists of the brain and the spinal cord. While the spinal cord is one structure with one task, to transmit impulses between the PNS and your brain, the brain has two structures.

- The **cerebrum** is the larger portion of the brain that controls all of your thought and interprets information from your senses.
- The **cerebellum** is the smaller portion of the brain that allows you to maintain your balance.

Sometimes impulses do not travel all the way up the spinal cord to the brain. A **reflex arc** allows you sense and respond to something without involving the brain. In reflex arcs, a sensory neuron is stimulated an interneuron in the spinal cord. The interneuron transfers the impulse directly to a motor neuron that will produce a response.

The PNS is also divided into parts. The part that controls voluntary responses is called the **somatic nervous system**. The **autonomic nervous system** controls only involuntary responses.

1. From sensing a stimulus to producing a response, how do your CNS and PNS work together?

2. How is a reflex arc different from other responses?

3. What is the difference between the two parts of the PNS?

Parts	Function	Details
CNS		
PNS		

#7



Name _____

Period _____

Date _____

SECTION 29.4 | **CENTRAL AND PERIPHERAL NERVOUS SYSTEMS**
Reading Guide

KEY CONCEPT

The central nervous system interprets information, and the peripheral nervous system gathers and transmits information.

VOCABULARY

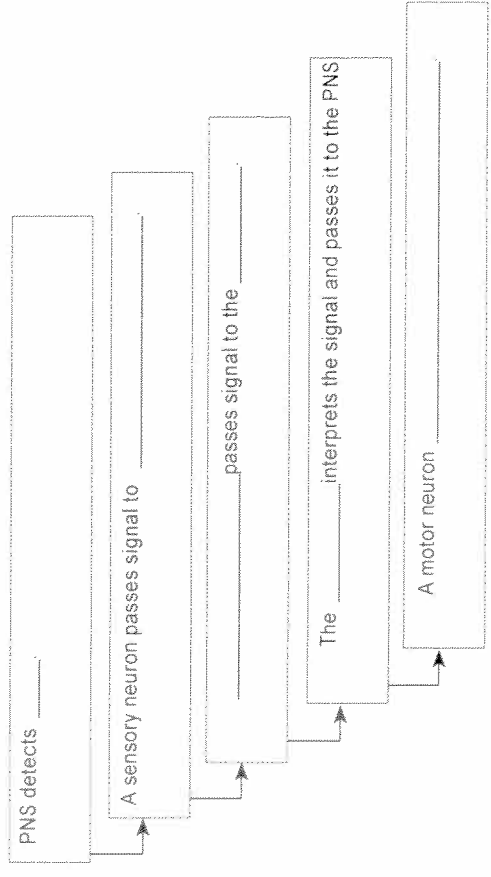
cerebrum	brain stem	autonomic nervous system
cerebral cortex	reflex arc	sympathetic nervous system
cerebellum	somatic nervous system	parasympathetic nervous system

MAIN IDEA: The nervous system's two parts work together.

- What organs make up the central nervous system?

- What types of neurons make up the peripheral nervous system?

On the first page of this section, you read about how the nerves, brain, and spinal cord work together to produce a response. Use the cause-and-effect diagram below to trace how the nervous system produces a response to a stimulus.



#8

Name _____

Period _____

Date _____

MAIN IDEA: The CNS processes information.

- What is the role of the cerebrum?

- What are the three main structures of the brain?

MAIN IDEA: The PNS links the CNS to the muscles and other organs.

Division of the PNS	Voluntary or Involuntary?	Examples of Tissues It Stimulates
somatic nervous system		
autonomic nervous system		
sympathetic nervous system		
parasympathetic nervous system		

Vocabulary Check

Explain how the clue can help you to remember the word's definition.

- word:** reflex arc; **clue:** An *arc* is movement that is in the shape of an arch.

- word:** autonomic nervous system; **clue:** *Autonomic* looks similar to the word *automatic*.

- word:** cerebral cortex; **clue:** A *cortex* is an outermost layer.

- word:** sympathetic nervous system; **clue:** Consider how something that is *sympathetic* might affect homeostasis.

8#

The Nervous System

Color the central nervous system one color and the peripheral nervous system another color. Make a legend.

☐ = central nervous system

peripheral nervous system

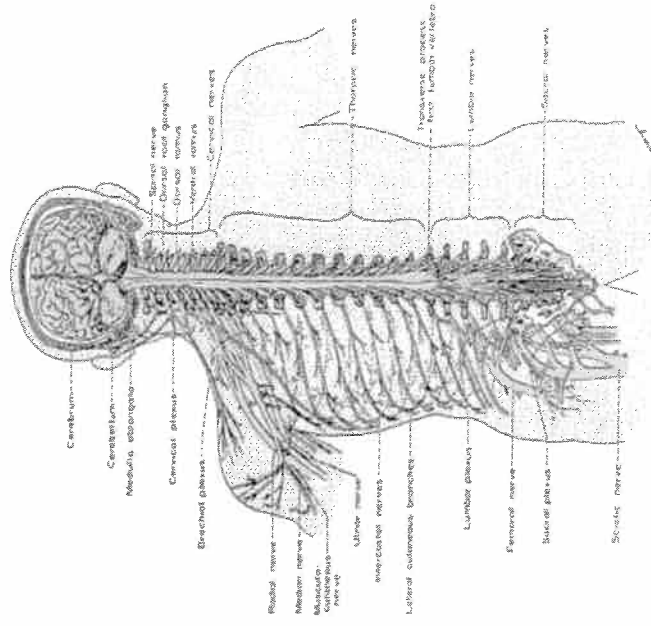


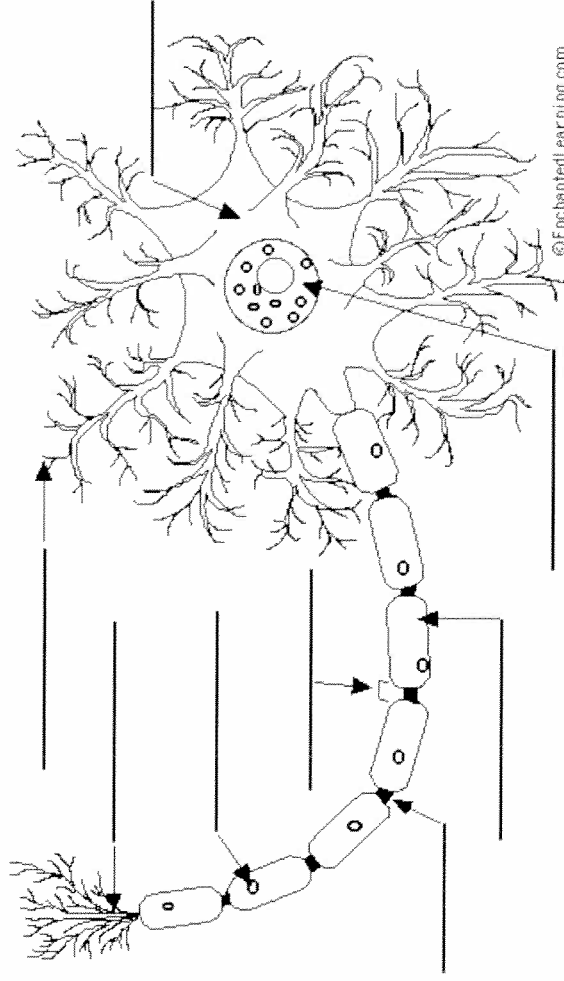
Fig. 2. The human central nervous system, exposed by dissection from the dorsal aspect. Shows the brain, spinal cord and the proximal parts of the spinal nerves.

- The human nervous system is composed of two major systems, the _____ nervous system and the _____ nervous system.
- The central nervous system is made up of the _____ and the _____.
- The peripheral nervous system is made up of _____.
- The function of the nervous system is _____.

Assignment: Neuron Structure and Function

In the table below define each of the terms, then use the terms to label and color the neuron diagram

axon —	myelin sheath —
axon terminals —	node of Ranvier —
cell body —	nucleus —
dendrites —	Schwann cells —

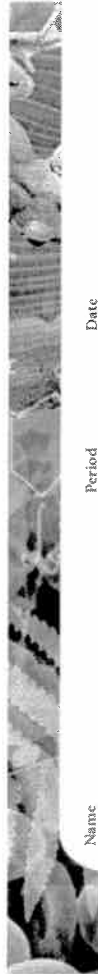


©EnchantedLearning.com

#9

6 #

Lab #7



Name

Period

Date

CHAPTER | CHAPTER INVESTIGATION

29 | The Stroop Effect

Psychologist John Stroop studied the processing of words and how these thought processes affected other mental tasks. He found that the brain must override an automatic response when it receives conflicting information, or interference. This is now called the Stroop Effect. In this lab, you will complete a task that demonstrates the Stroop Effect.

Problem

How does interference affect the completion of a task?

Procedure

- In column 1, using the colored pencils, write the following words in their own color: blue, yellow, red, green, black, purple, gray, orange.
- Have your partner time and record how long it takes for you to say aloud the color of ink in which each word in column 1 is printed. Give your response as quickly as possible. Also record the number of incorrect responses. Use Table 1 to record your results.

TABLE 1. TIME TAKEN TO COMPLETE TASK WITHOUT INTERFERENCE		
Column 1	Time (Sec)	Correct (C)/Incorrect (I)
Total incorrect responses:		

MATERIALS

- blue, yellow, red, green, black, purple, gray, and orange colored pencils
- watch with second hand

PROCESS SKILLS

- Observing
- Collecting Data
- Inferring

Copyright © by McDougal Littell, a division of Houghton Mifflin Company

CHAPTER 29 Nervous and Endocrine Systems

CHAPTER 29 Nervous and Endocrine Systems

Name

Period

Date

- In Column 2, write the following words in the following colors:

- write the word *red* in yellow
- write the word *gray* in green
- write the word *orange* in purple
- write the word *blue* in black
- write the word *black* in orange
- write the word *yellow* in blue
- write the word *green* in red
- write the word *purple* in gray

- Have your partner time and record how long it takes for you to say aloud the color of ink in which each word in column 2 is printed (say the color, not the word itself). Give your response as quickly as possible. Also record the number of incorrect responses. Use Table 2 to record your results.

TABLE 2. TIME TAKEN TO COMPLETE TASK WITH INTERFERENCE		
Column 2	Time (Sec)	Correct (C)/Incorrect (I)
Total incorrect responses:		

- Switch roles and repeat steps 1 and 2.

Analyze and Conclude

- Analyze** Compare the times for naming the ink colors in both column 1 and column 2. Was there a difference between the two times? Explain why this difference exists.

2. How many incorrect responses did you give for each column? why did incorrect responses occur?

Chapter Investigation
McDougal Littell Biology Lab Binder

HUMAN BIOLOGY 15

HUMAN BIOLOGY 16

Chapter Investigation
McDougal Littell Biology Lab Binder

#10

#10

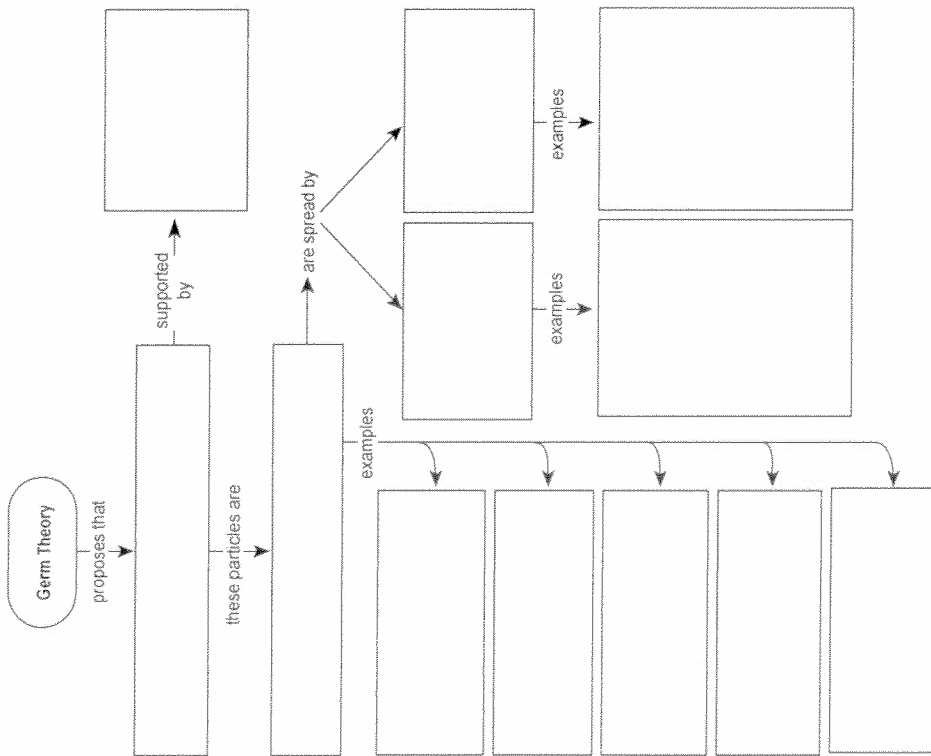
31.1

Power Notes

31.1

Reinforcement

Pathogens and Human Illness



KEY CONCEPT Germs cause many diseases in humans.

Before the 1800s, people thought that illnesses were caused by spirits. Around 1850, however, that all changed with the developments that were made by three scientists. Their work provided evidence that disease is caused by germs.

- In 1857, Louis Pasteur came up with **germ theory**, which states that diseases are caused by small, physical particles and not spirits. These disease-causing particles are called **pathogens**.
- Around 1865, Joseph Lister found that cleaning his surgical tools with acid before a surgery greatly reduced the patient's chance for getting an infection and dying.
- Until 1883, there was no way to test germ theory. Robert Koch changed that by developing four conditions: (1) the pathogen thought to cause a disease was present in every case; (2) the pathogen can be isolated from the body; (3) healthy animals will catch the disease when given the pathogen; and (4) the pathogen can be isolated from the newly infected animal. If a scientist studying a disease found all of these things to be true, one could conclude that the pathogen that was isolated did in fact cause the disease.

There are five types of pathogens that cause a variety of diseases: bacteria, viruses, fungi, protozoa, and parasites. Each of these pathogens harm the body by destroying cells, taking cells' nutrients, or poisoning cells. In order for a pathogen to cause an infection, it must somehow get inside the body. Generally, a pathogen can enter the body in one of two ways

- In direct contact, a pathogen spreads when an infected individual touches a healthy individual.
- Diseases that spread by indirect contact can infect a healthy person who encounters the pathogen that is waiting on a surface, such as a doorknob. Indirect contact also includes diseases that are spread by vectors. A **vector** is a living agent, such as a mosquito, that transfers a pathogen from one person to another.

1. How is germ theory different from previous theories of disease?

2. What is a pathogen, and what are the five general types?

3. How are pathogens that spread by direct contact different from those that spread by indirect contact?

4. What is a vector?

#12

e1#



Name _____

Period _____

Date _____

SECTION 31.1 PATHOGENS AND HUMAN ILLNESS

Reading Guide

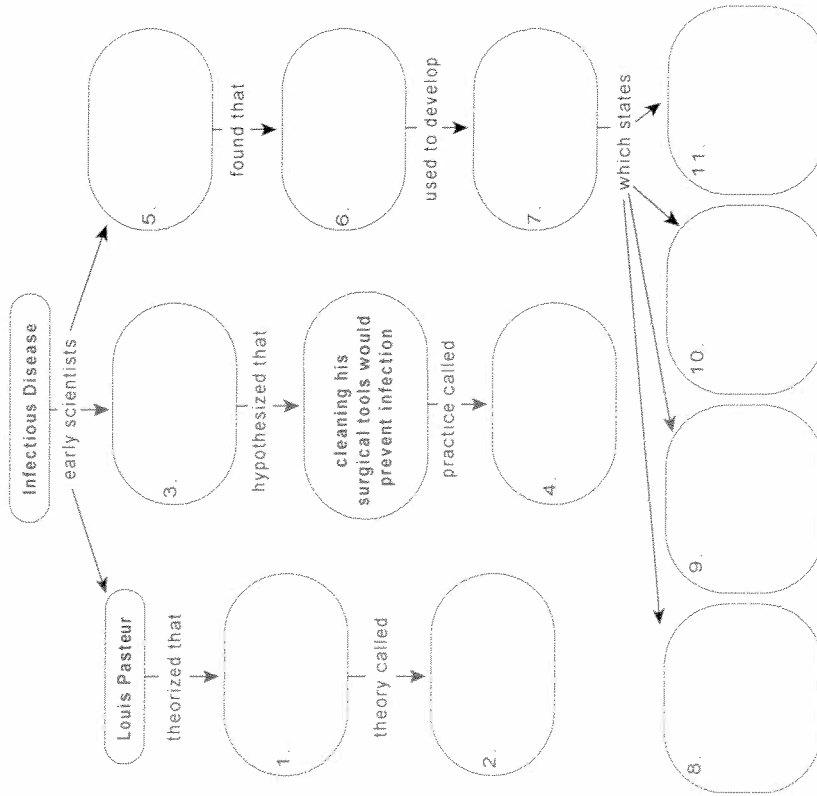
KEY CONCEPT

Germ theory states that many diseases in humans.

VOCABULARY

germ theory pathogen vector

MAIN IDEA: Germ theory states that microscopic particles cause certain diseases. Use the concept map below to take notes on early research about infectious diseases.

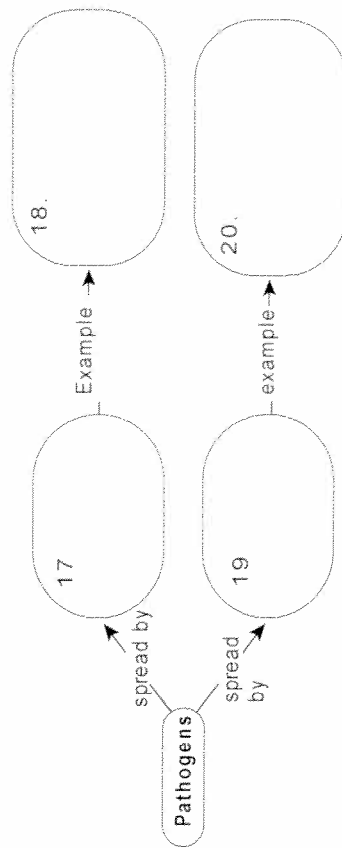


#13

MAIN IDEA: There are different types of pathogens. Fill in the chart to take notes on the different types of pathogens.

Pathogen	Causes Disease By:
12. bacteria	
13. viruses	
14. fungi	
15. protozoa	
16. parasites	

MAIN IDEA: Pathogens can enter the body in different ways. Use the concept map to take notes on how pathogens spread.



Vocabulary Check

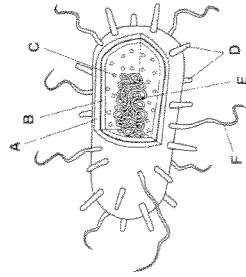
21. Something that causes disease is called a _____

22. A vector is something that _____

#13

Use CH 18 on virus/Bacteria to answer questions

Viruses / Bacteria Worksheet

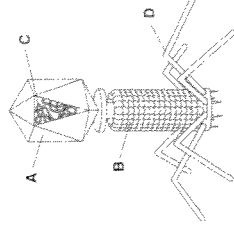


1. What is this structure?
2. Identify parts A-F.
3. Name the two kingdoms of bacteria. List one way these groups differ from each other.
4. Describe two roles bacteria have in the environment.
5. What are three foods that have been made using bacteria?
6. Following a flood, people are often advised to boil their drinking water. Explain why this is necessary.

7. Describe two ways of killing bacteria.

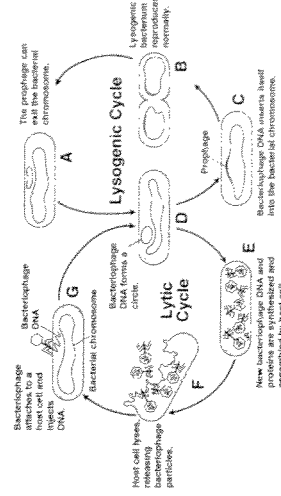
8. How are bacteria classified?

9. What are the three main shapes of bacteria?



10. What is this structure to your right?
11. What type of organism does this virus infect?
12. Label parts A-D

Virus life cycle A – G



13. Which letter indicates the host cell being lysed (destroyed)?
14. Which letter above represents the stage at which a host cell begins producing new bacteriophages?
15. Which letter indicates the stage at which the bacteriophage injects its DNA into the host cell?
16. Looking at the above diagram which viral life cycle (lysogenic or lytic) is actively using and then lysing *Escherichia coli* body cells to make more viruses?

801235

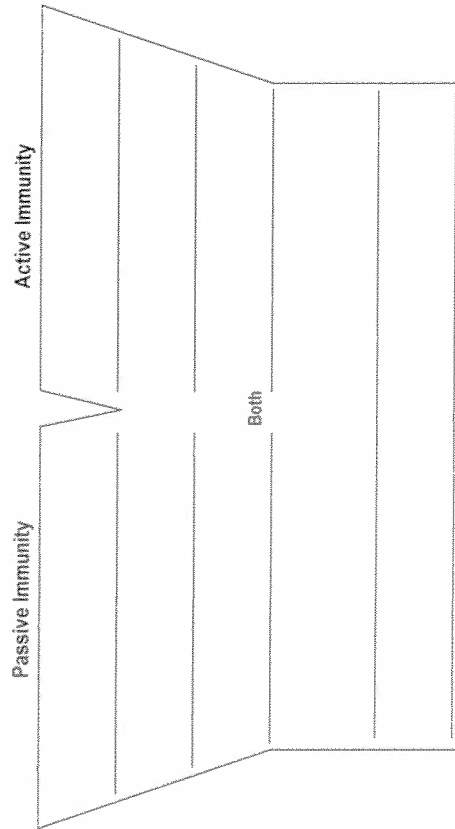
31.2

INFORMATION CYCLES

Power Notes

The immune system is:

Part	How It Contributes to the Immune System
Skin	
Mucous membrane	
Circulatory system	
Phagocyte	
T cell	
B cell	
Antibody	
Interferon	



SECTION | IMMUNE SYSTEM

31.2 Reinforcement

KEY CONCEPT The immune system consists of organs, cells, and molecules that fight infections.

The **immune system** is the body system that fights infections. However, many parts of different body systems help to prevent infection.

- Your skin blocks pathogens from getting into the body. The skin has sweat and oil glands that make its surface difficult for pathogens to grow on.
- Mucus membranes in your nose, mouth, and ears contain sticky substances that trap pathogens.
- If a pathogen does get into the body, the circulatory system helps fight the infection by transporting the immune system's specialized cells.

There are many specialized white blood cells and proteins of the immune system.

- Three important types of white blood cells are phagocytes, B cells, and T cells. **Phagocytes** destroy pathogens by surrounding and engulfing them. **B cells** and **T cells** fight pathogens in other ways.
- Complement proteins might attract phagocytes to an infected area. **Antibodies** are proteins made by B cells that cause pathogens to become inactive. **Interferons** are proteins that prevent viruses from reproducing.

People do not get sick every time they become infected because they have immunity.

- **Passive immunity** is the type of immunity that a person gets through their genetic makeup or through the antibodies they ingest as infants through their mother's milk.
- **Active immunity** is acquired only after a person's white blood cells encounter a pathogen.

For each pair of terms, write one sentence that includes both words and explains the relationship between them.

- ## 1. antibodies, B cells

2. phagocyte, active immunity

3. immune system, skin



91#

Name _____ Period _____ Date _____

SECTION 31.2 IMMUNE SYSTEM
Reading Guide

KEY CONCEPT

The immune system consists of organs, cells, and molecules that fight infections.

VOCABULARY			
immune system	B cell	passive immunity	
phagocyte	antibody	active immunity	
T cell	interferon		

MAIN IDEA: Many body systems protect you from pathogens.

1. What is the immune system?

2. For each, describe how it helps the immune system by protecting the body from pathogens.

Tissue or Body System	How It Protects the Body from Infection
skin	
mucus membrane	
circulatory system	

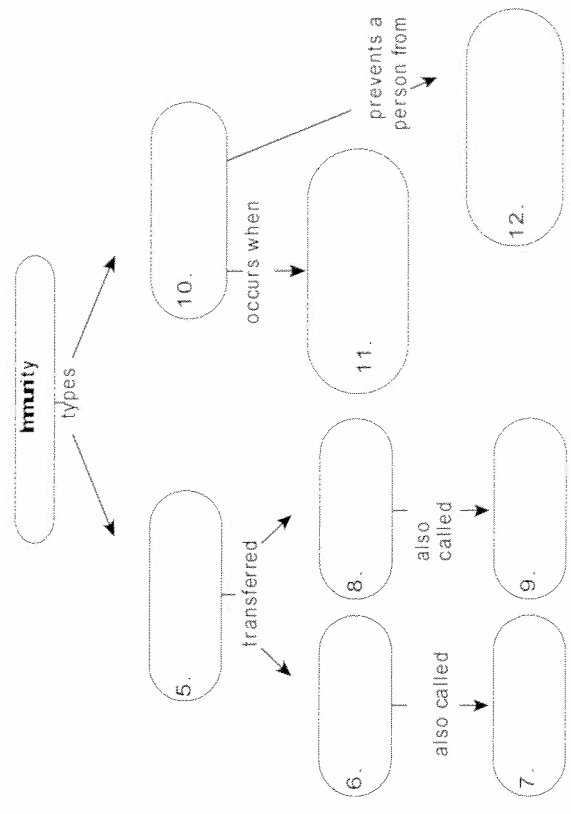
MAIN IDEA: Cells and proteins fight the body's infections.

3. How do your basophil cells react when a pathogen enters the body?

4. What are three ways that antibodies help fight infection?

MAIN IDEA: Immunity prevents a person from getting sick from a pathogen.

Fill in the blanks in the concept map to take notes on the differences between active and passive immunity.



Vocabulary Check

13. Come up with a way to remember the difference between B cells and T cells.

14. The word *phagocyte* comes from two Greek words: *phago-* means "to eat" and *-cyte* means cell. How can this help you remember the definition of the word *phagocyte*?

15. *Interferon* is similar to the word *interference*. How can this clue help you remember what *interferon* means?

#16



Name _____

Period _____

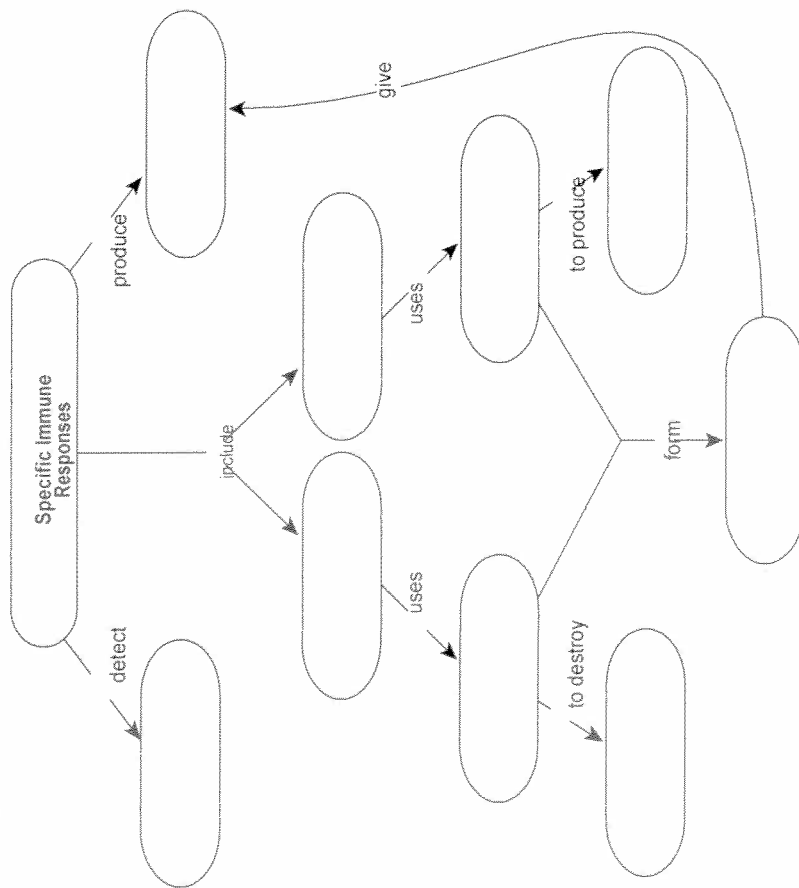
Date _____

SECTION 31.3 IMMUNE RESPONSES
Power Notes

Nonspecific immune responses are _____

Example: _____

Example: _____



Tissue rejection occurs when _____



Name _____

Period _____

Date _____

SECTION 31.3 IMMUNE RESPONSES
Reinforcement

KEY CONCEPT The immune system has many responses to pathogens and foreign cells.

Inflammation and fever are called nonspecific immune responses because these responses occur the same way for every pathogen.

- **Inflammation** occurs when white blood cells release chemicals that cause blood vessels to become leaky, allowing phagocytes to squeeze out of the circulatory system and toward an infection site.
- Increased body temperatures during a low fever speed up the production and maturation of white blood cells that fight infection.

In specific responses, specialized cells fight specific pathogens. White blood cells can identify pathogens because pathogens have protein markers, called **antigens**, on their surfaces. After a specific immune response occurs, **memory cells** are formed. These cells remember the pathogen, and they are ready to fight immediately if they ever encounter the pathogen again.

- In **cellular immunity**, T cells are the main player. When they encounter specific antigens, they become activated and divide. The activated T cells will destroy the pathogens and the infected cells in the body.
- **Humoral immunity** relies mostly on B cells. When a T cell activates a B cell, the B cell divides and matures. Then the B cell produces antibodies that cause the pathogens to clump, burst or become inactive.

White blood cells will recognize any particle or cell that is not the same as the other cells in the body. If a person gets an organ transplant, the immune system will probably notice that this tissue's protein markers are different and attack the tissue. **Tissue rejection** occurs with the immune system attacks a transplanted tissue. People who receive organ and tissue transplants usually have to take medications that will weaken their immune system so that their white blood cells do not destroy the donated tissue.

1. How do inflammation and fever help the immune system?

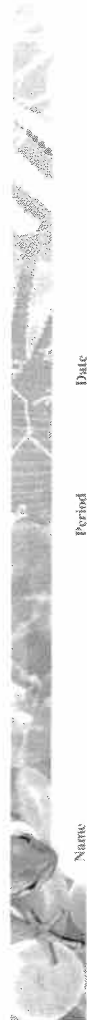
2. How can white blood cells tell the difference between body cells and pathogens?

3. What type of white blood cell functions in cellular immunity? Humoral immunity?

4. Why do white blood cells sometimes cause tissue rejection?

#18

81#



Name _____

Period _____

Date _____

SECTION
31.3
IMMUNE RESPONSES
Reading Guide

KEY CONCEPT

The immune system has many responses to pathogens and foreign cells.

VOCABULARY

inflammation	memory cell	humoral immunity
antigen	cellular immunity	tissue rejection

MAIN IDEA: Many body systems work to produce nonspecific responses.

1. What is the difference between a specific immune response and a nonspecific immune response?

In the table, write the characteristics of each of the nonspecific immune responses. Then, in the third column, explain how this nonspecific response helps the immune system to fight off infections.

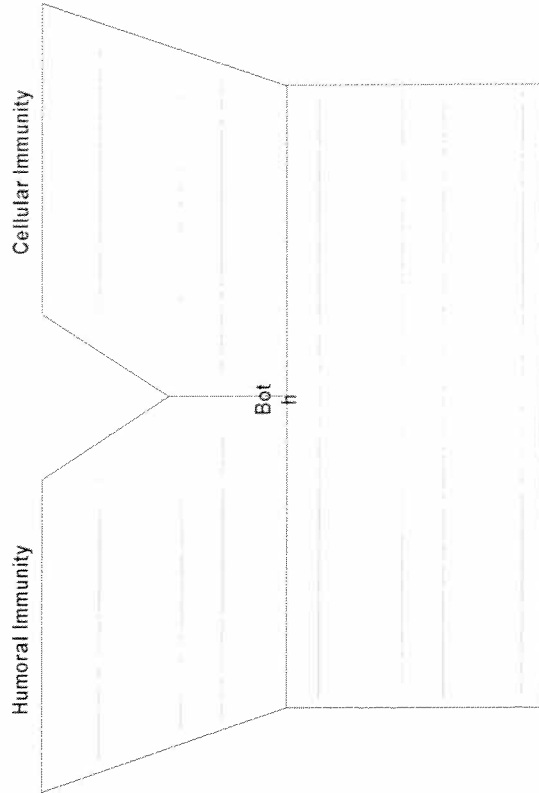
Nonspecific	Characteristics	How It Helps the Immune
2. inflammation		
3. fever		

MAIN IDEA: Cells of the immune system produce specific responses.

4. How does the immune system know if a foreign particle has infected the body?

5. What is the role of memory cells in providing acquired immunity?

Using Figures 31.10 and 31.11, write the differences for each type of immunity on the right or left side of the Y diagram below. Then, write the similarities on the bottom of the Y.



MAIN IDEA: The immune system rejects foreign tissues.

6. Donors and recipients should have _____ differing antigens.
7. An organ recipient takes drugs that _____ the immune system.

Vocabulary Check

8. What do *memory cells* remember?

9. How does the word *rejection* help you to remember what *tissue rejection* means?

10. The prefix *anti-* means "destroying" and, the suffix *-gen* means "something that produces or lives." How can this help you remember the definition for the word *antigen*?

#19

61#