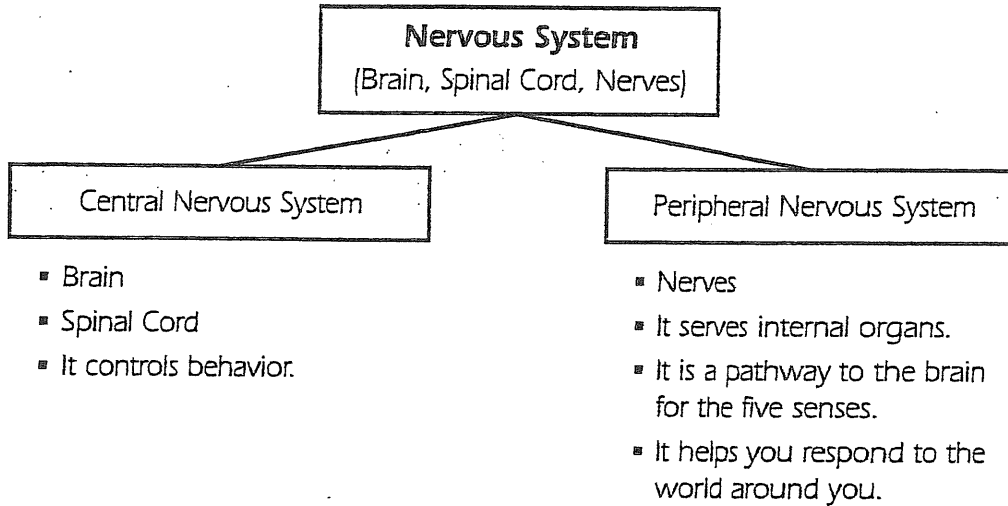


**BODY SYSTEMS**

**NERVOUS SYSTEM**

The nervous system helps you respond to the world around you.

This system has two main divisions:

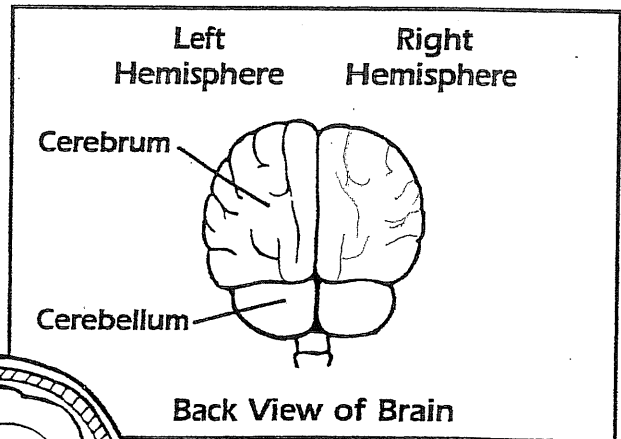


The brain is divided into three main parts.

**Cerebrum**  
Controls higher processes and senses (speech, reasoning, memory, motor, smell, touch, taste, sight, hearing)

**Cerebellum**  
Coordinates motor movement

**Medulla**  
Controls involuntary reflexes



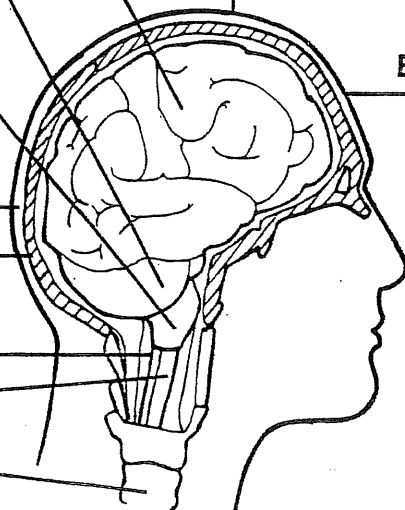
**Scalp**

**Skull**  
(protects brain)

**Spinal Nerve**

**Spinal Cord**

**Spinal Column**  
(protects spinal cord)



Brain cells, once destroyed by injury, disease, or birth defects, cannot grow back. Their damage is irreversible.

**BODY SYSTEMS**

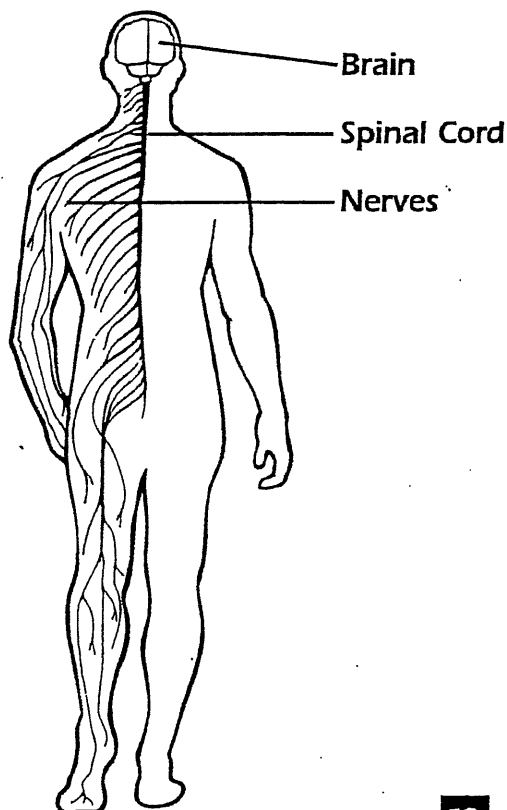
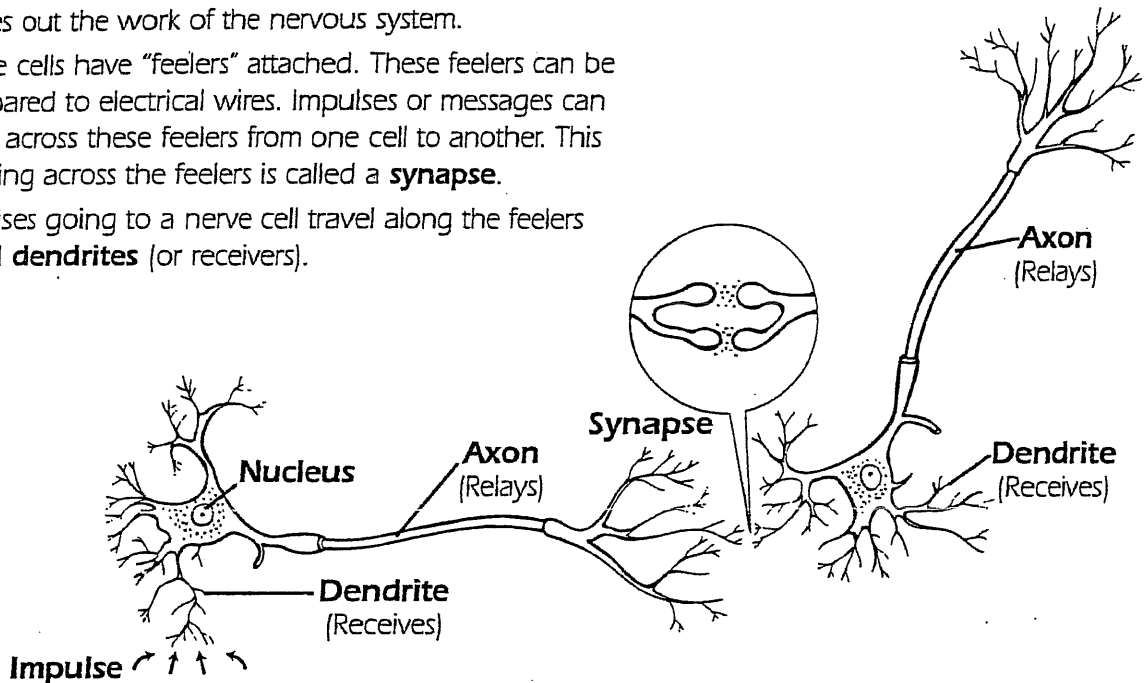
**NERVOUS SYSTEM**

The individual nerve cell, or neuron, is the basic unit that carries out the work of the nervous system.

Nerve cells have "feelers" attached. These feelers can be compared to electrical wires. Impulses or messages can jump across these feelers from one cell to another. This jumping across the feelers is called a **synapse**.

Impulses going to a nerve cell travel along the feelers called **dendrites** (or receivers).

**Neuron—A Nerve Cell**



Impulses leaving a nerve cell travel along the feelers called **axons** (or senders).

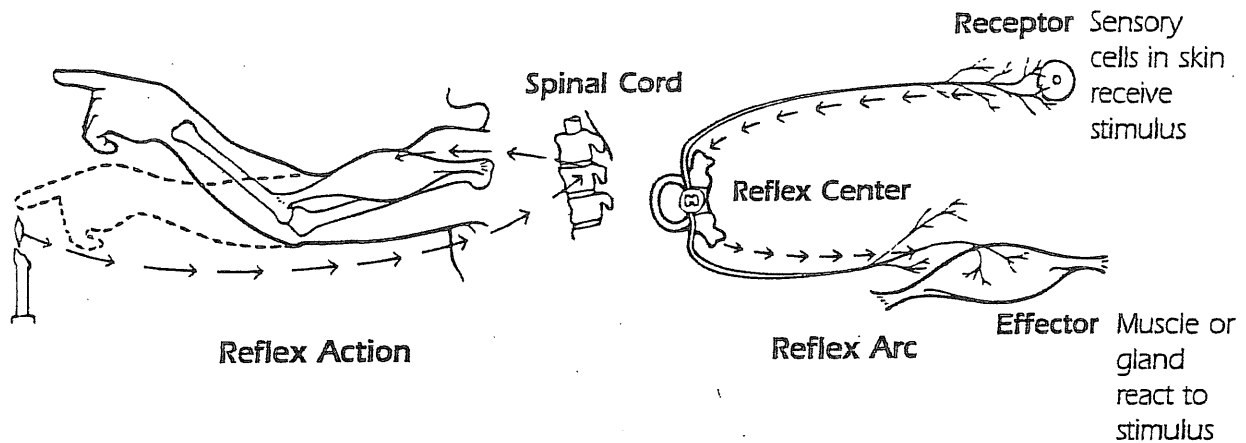
All impulses must go through at least one of the body's switchboards—either the brain or the spinal cord. From the switchboard, impulses are sent along the axons and through the dendrites to the nerve cells of the organ that must react to the stimulus. This might be a muscle or a gland.

A response which is involuntary such as breathing, digesting food, or pulling away from something hot is called a **reflex action**. Voluntary actions are those we perform with our conscious mind such as reading, speaking, or walking.

**BODY SYSTEMS**

**NERVOUS SYSTEM**

Some messages that the sensory nerves (located all over our body) send are marked **urgent**. They are usually messages of pain. An immediate action is necessary to relieve some discomfort. All these reactions are called **reflexes**. A reflex is an automatic reaction to some sense message, like pain. The information gets processed in your spinal cord. Your muscles begin to react immediately even before your brain gets the news of what is happening. This bypass is called a **reflex arc**.



Explain how each of the following reflexes serve a useful purpose.

1. The blinking of an eye \_\_\_\_\_  
\_\_\_\_\_
2. Pulling finger back from heat \_\_\_\_\_  
\_\_\_\_\_
3. Increased heartbeat during exercise \_\_\_\_\_  
\_\_\_\_\_
4. Elimination of waste from the body \_\_\_\_\_  
\_\_\_\_\_
5. Taste, sight, or smell of food stimulates the flow of saliva in mouth.  
\_\_\_\_\_  
\_\_\_\_\_
6. Spitting out a bad-tasting food \_\_\_\_\_  
\_\_\_\_\_
7. A fever \_\_\_\_\_  
\_\_\_\_\_

**BODY SYSTEMS****REVIEW**

1. Name the main parts of the nervous system.  
A. \_\_\_\_\_ B. \_\_\_\_\_ C. \_\_\_\_\_
2. What function does the brain perform in our nervous system? \_\_\_\_\_  
\_\_\_\_\_
3. The brain and spinal cord are very delicate organs. Each is housed in areas which give them special protection. The brain is protected by the \_\_\_\_\_, and the spinal cord is protected by the \_\_\_\_\_.
4. Some responses to our environment are controlled by our brain and are called voluntary. Other responses are involuntary and are performed without our brain becoming involved in the decision. Write V on the blanks for voluntary responses and I for involuntary responses.
 

A. _____ breathing	F. _____ singing
B. _____ talking	G. _____ reading
C. _____ swimming	H. _____ heart beating
D. _____ blood circulation	I. _____ pronouncing a recognized word
E. _____ pulling finger out of a fire	J. _____ digesting food
5. Why does brain damage due to injuries, diseases, or birth defects have such a serious consequence on our lives? \_\_\_\_\_  
\_\_\_\_\_
6. A nerve cell is called a \_\_\_\_\_.
7. The \_\_\_\_\_ is the largest part of your brain and makes up about 85% of the brain's weight. It regulates posture, balance, and movement and controls actions guided by your own will.
8. The \_\_\_\_\_ coordinates movements and helps muscles work together.
9. The \_\_\_\_\_ regulates the involuntary action of the lungs, heartbeat, digestion, and secretions of glands.
10. Some \_\_\_\_\_ actions are an automatic response to a stimulus.

