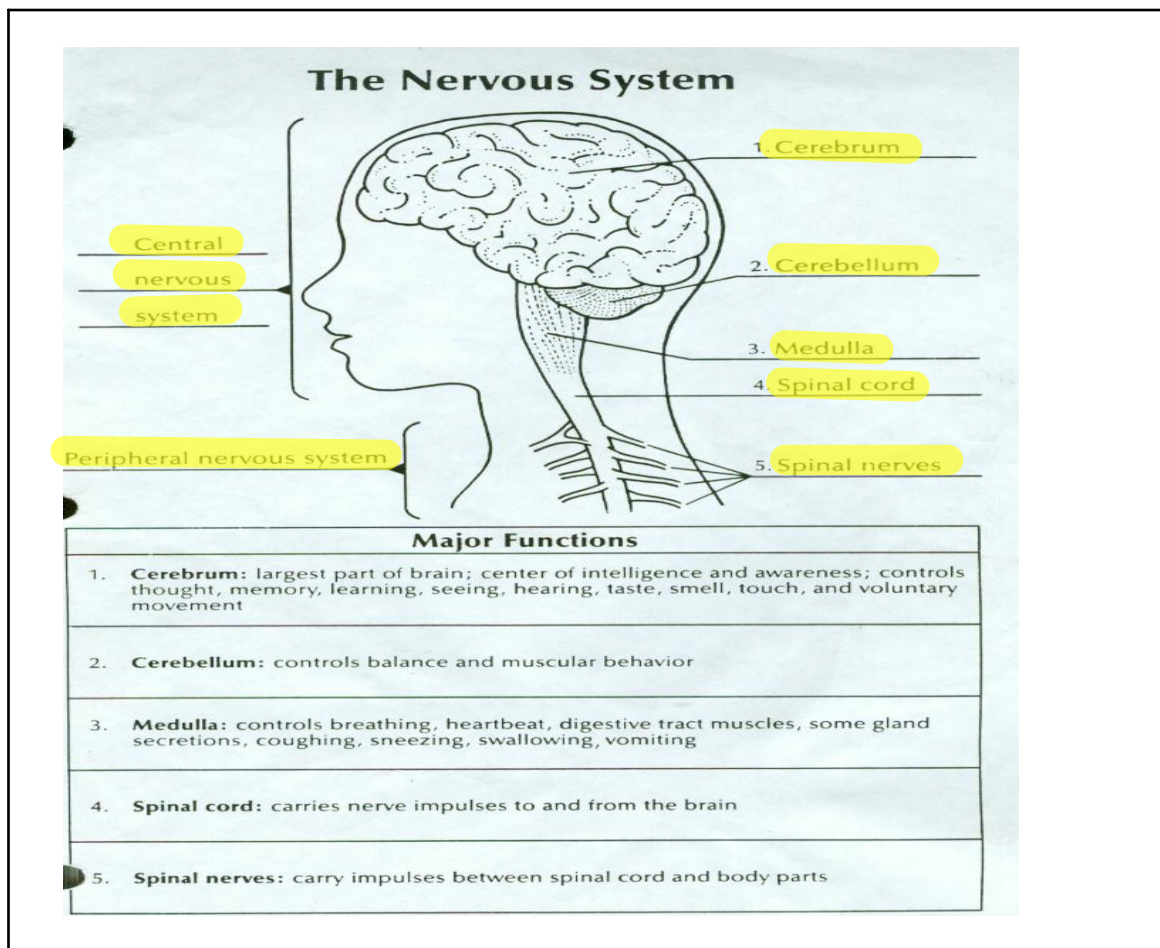
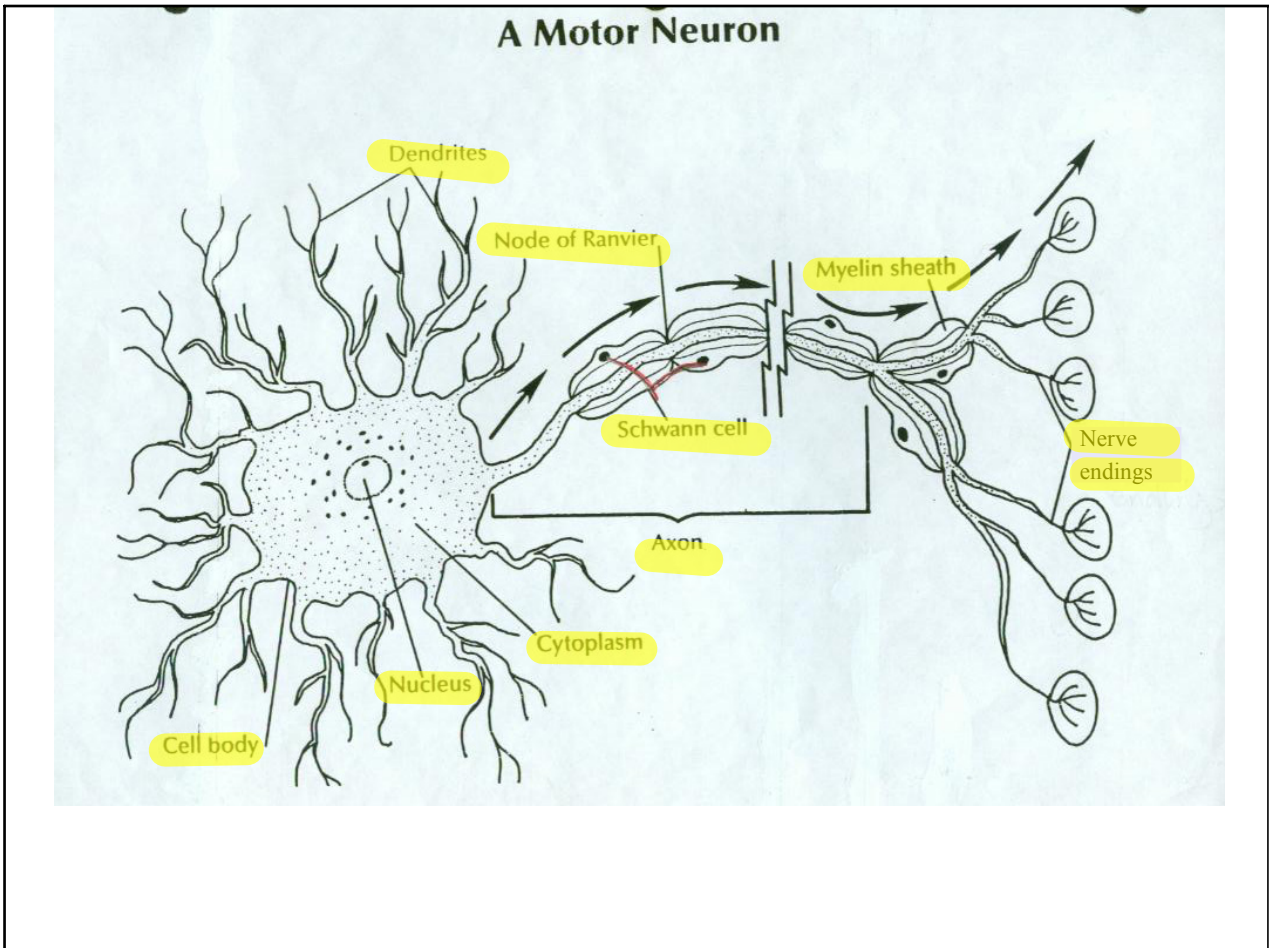
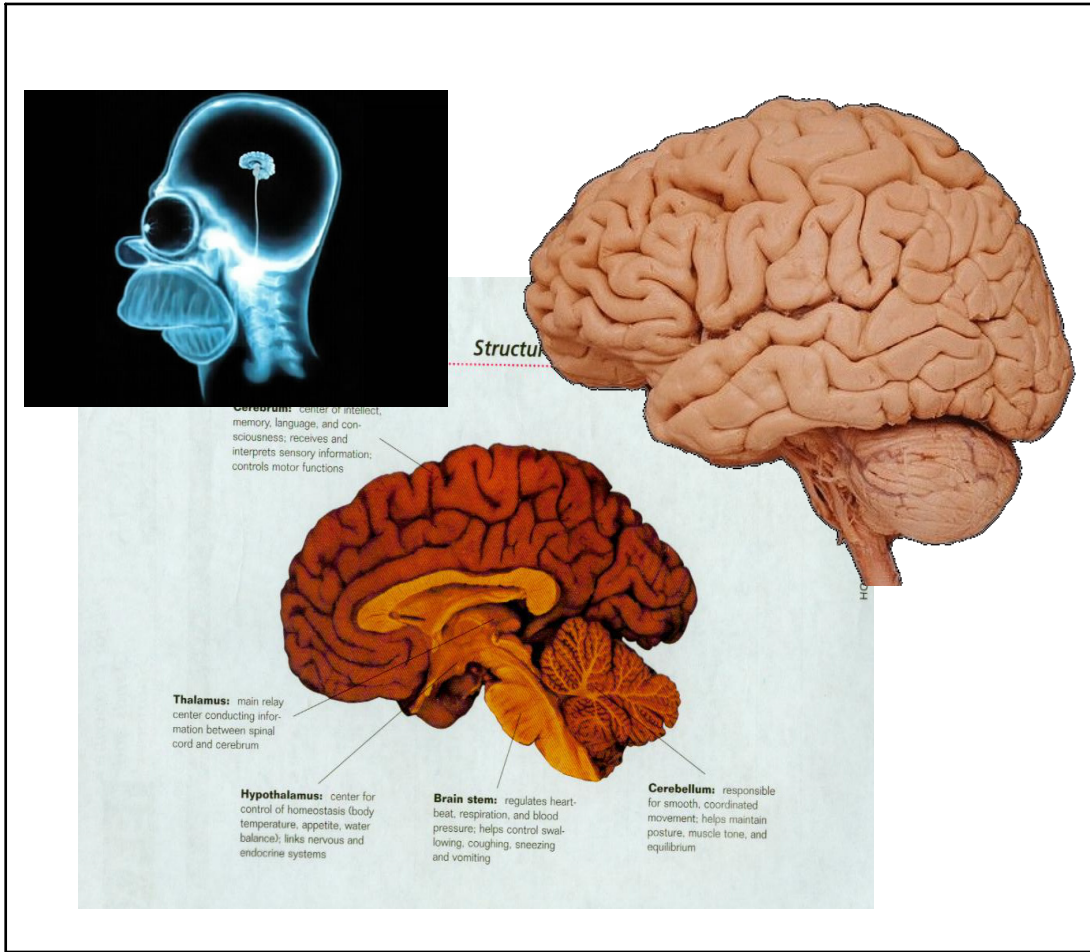


NERVOUS SYSTEM

JOB OF THIS SYSTEM:

- ***Receives & relays information about activities within the body; monitors & responds to internal & external change.***





HOLT BIOSOURCES
TEACHING TRANSPARENCIES

Physiology of a Nerve Impulse **195**

Resting potential

Inside cell: $[Na^+]$ $[K^+]$

Outside cell: $[Na^+]$ $[K^+]$

Action potential

Path of impulse

At rest, sodium-potassium pumps in a neuron's membrane keep a higher concentration of sodium ions outside the cell and a higher concentration of potassium ions inside, creating a voltage difference called the **resting potential**. When an impulse moves down an axon, sodium ions rush into the cell, creating a reversal in voltage called an **action potential**.

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HOLT BIOSOURCES
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Structure of a Neuron **194**

Nerves are made of cells called neurons. A motor neuron like this one is specialized to transmit messages rapidly to muscle cells.

Impulses travel along a neuron by successively opening ion channels at exposed gaps.

Cell body

Cell nucleus

Many dendrites lead to the cell body.

A single long axon extends from the cell body.

The axons of motor nerves have a myelin sheath that acts as an electrical insulator.

Neurons connect to other neurons or to muscles at tiny gaps called synapses. Chemicals called neurotransmitters carry the nerve signal across the synapse.

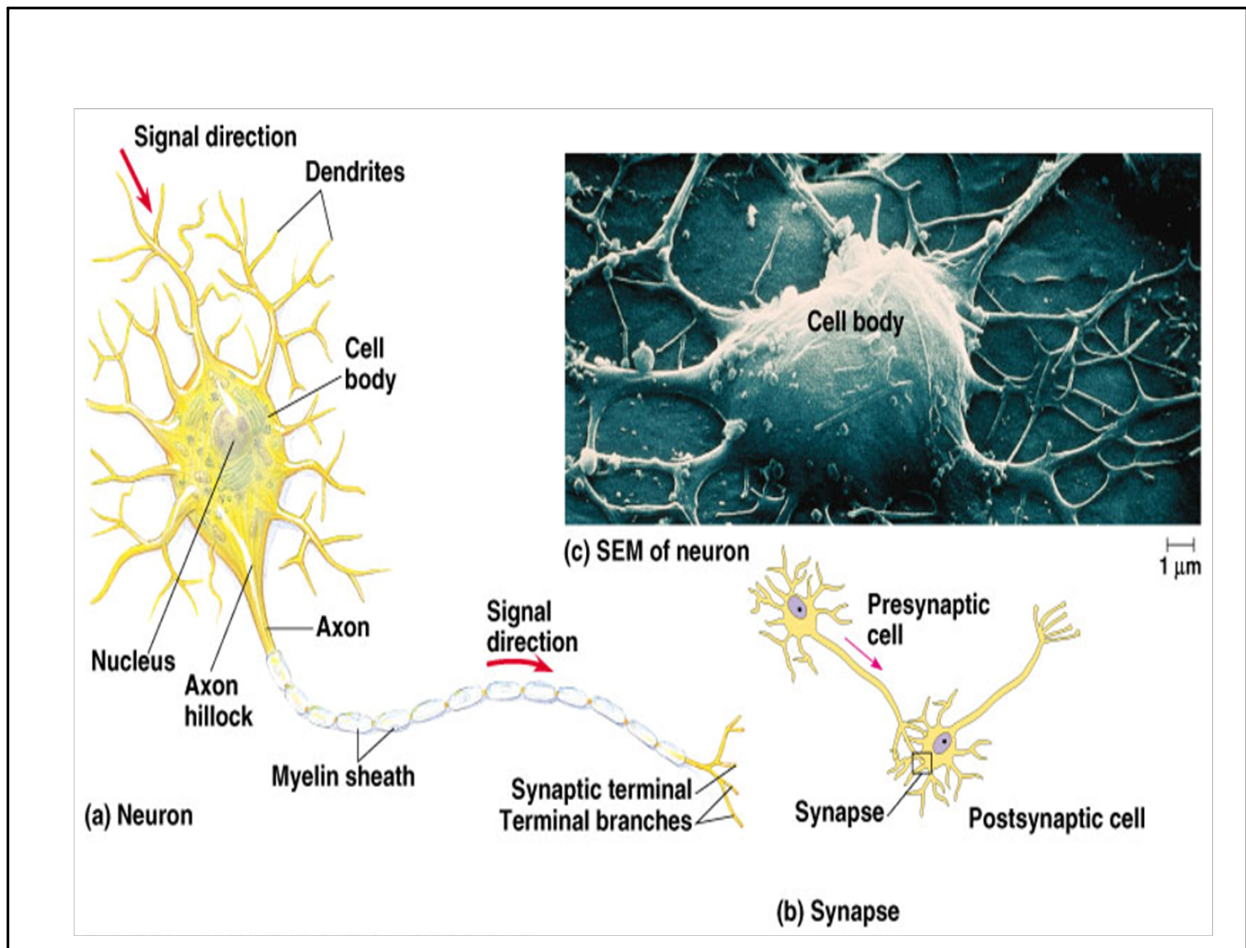
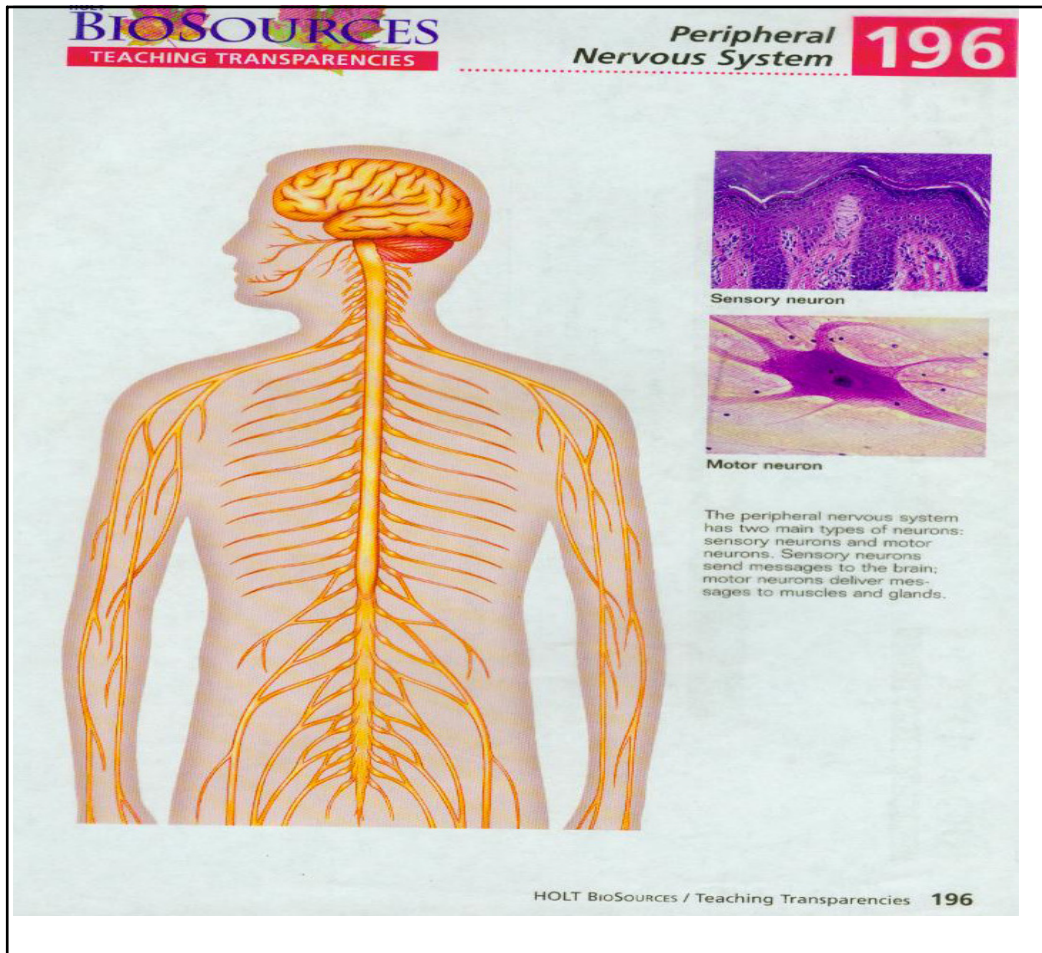
At the far side of the synapse, the neurotransmitter opens a gated sodium channel through the plasma membrane of the cell receiving the nerve impulse.

The tips of many axons are branched.

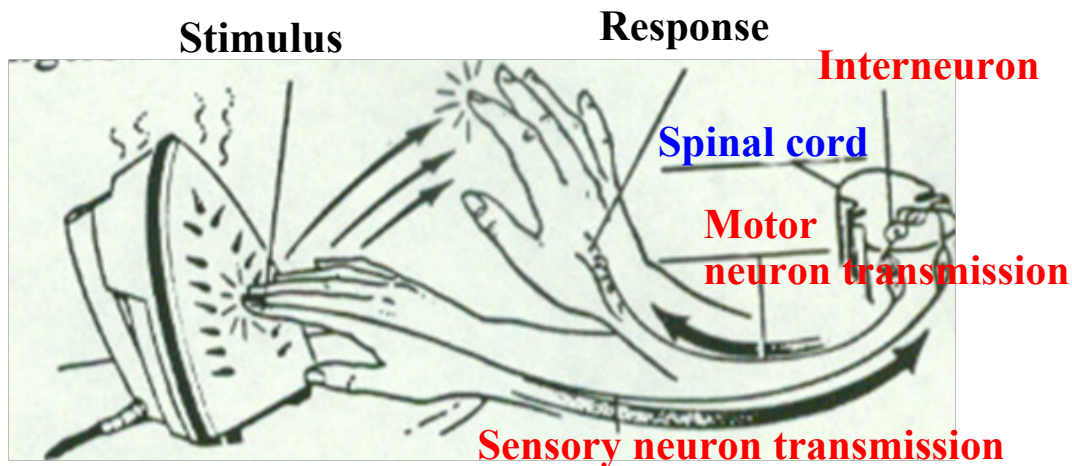
Sodium channel

Plasma membrane

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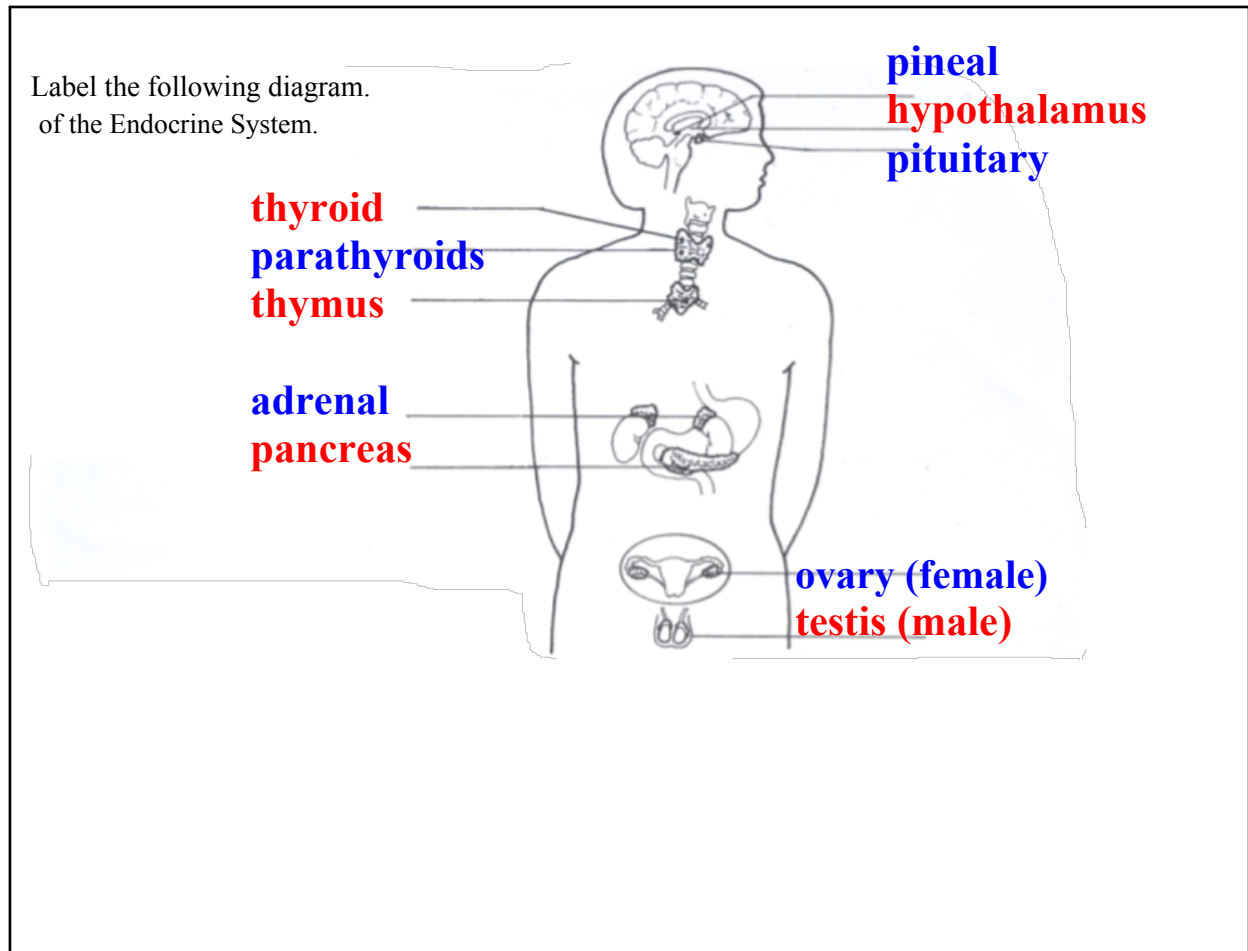
List the order of a message sent to your brain in response to you touching a very hot iron with your fingers & then pulling away.
(See diagram)



ENDOCRINE SYSTEM

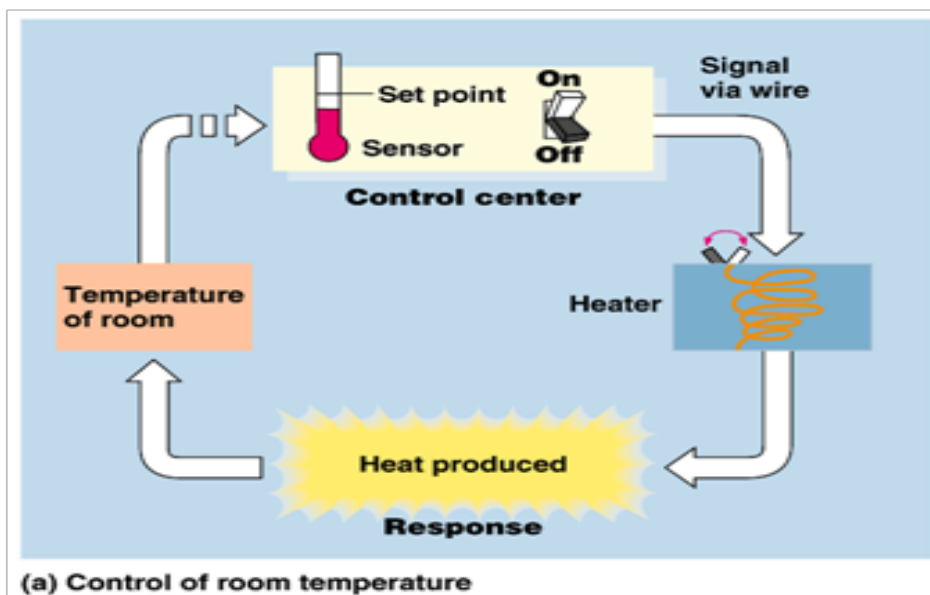
JOB OF THIS SYSTEM:

- A *series of glands that release chemicals* directly into the *bloodstream*, that *acts as messengers relaying information to other parts of the body*.
- The *functions of all body systems* are *controlled by* the *endocrine and nervous systems*.
- Helps *maintain homeostasis in the body*.



- ***Negative feedback system*** - an ***internal feedback mechanism*** in which a ***substance is fed back to inhibit the original signal and reduces production of a substance.***
- In other words it ***slows down or stops hormone production*** until it is needed again.

- **Positive feedback system** is when the **variable continually increases**, i.e. a bacterial colony given food, the growth of the colony will continually increase.
- In other words there is **no stopping the positive feedback system (until supply runs out)**.



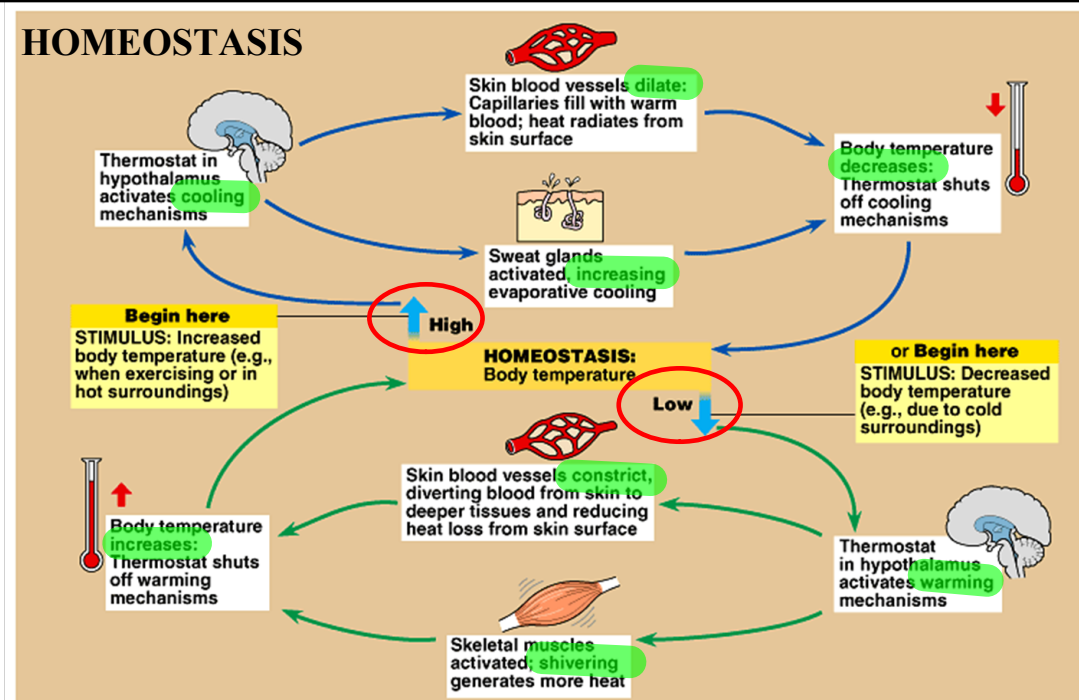
Temperature COLD

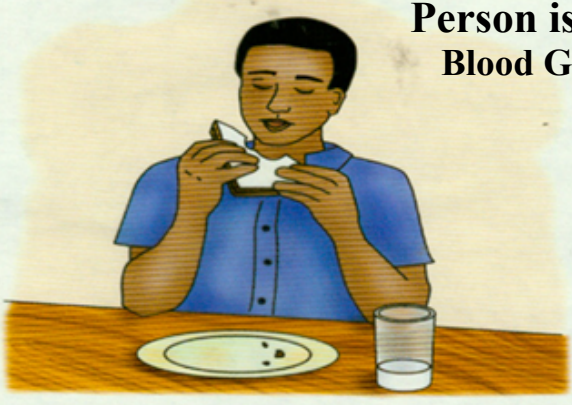


1. Shivering warms body
2. The person feels cold, shivers, warms up, stops shivering

- 1 What is the internal result of each of these actions?
- 2 Describe the feedback loop involved in each situation.

HOMEOSTASIS



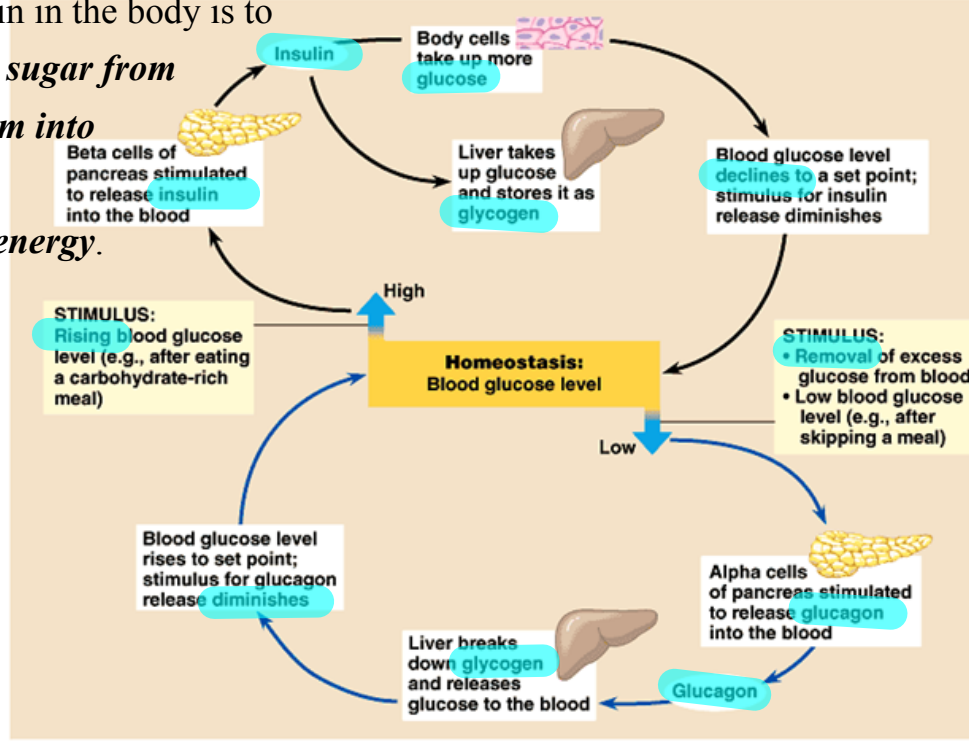


Person is hungry
Blood Glucose drops

1. Eating increases blood glucose levels.
2. The person eats, blood glucose levels rise, insulin is released, the liver takes in glucose, blood glucose levels decrease.

- 1 What is the internal result of each of these actions?
- 2 Describe the feedback loop involved in each situation.

The role of insulin in the body is to help *move blood sugar from your blood stream into your cells*. This *gives your cells energy*. Everyone's body needs insulin



The body also needs calcium *for muscles*

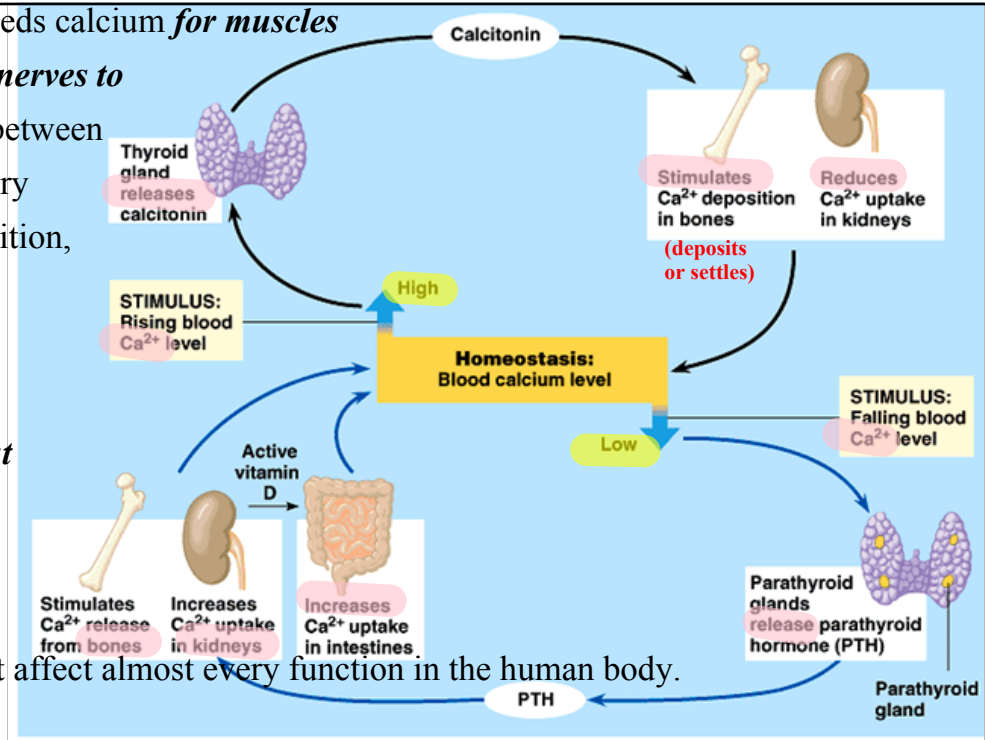
to move and for nerves to carry messages between

the brain and every body part. In addition,

calcium is *used to help blood vessels move*

blood throughout the body and to help release

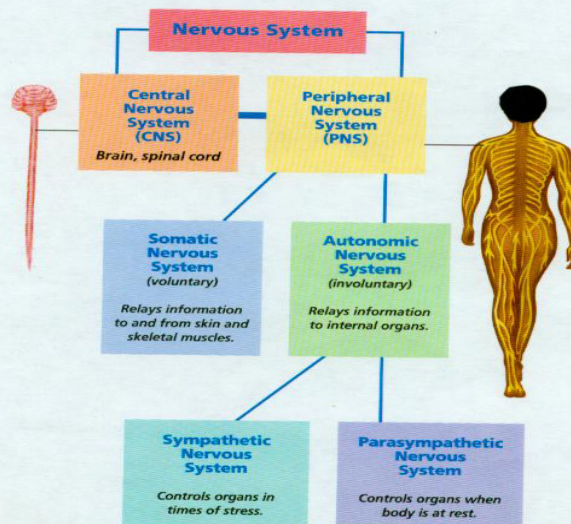
hormones and enzymes that affect almost every function in the human body.



STOP

Transparency **67** Organization of the Nervous System

BASIC CONCEPTS
Use with Chapter 36, Section 36.1



STOP