

■ The Nervous System

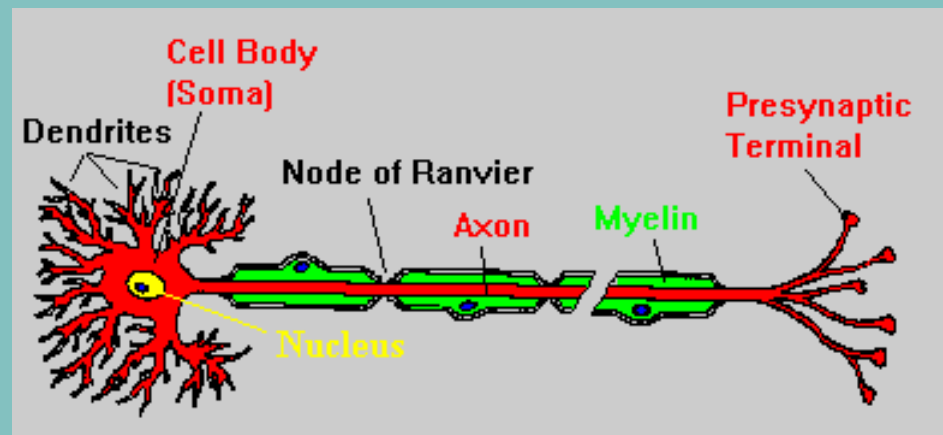
■ Function???

- ... the body's mission control center.
- ... keep the life-support systems functioning together

Cells of the Nervous System

■ **Neurons** – the basic unit (cell) of the nervous system. Neurons bundled together are called **NERVES**.

- Cell Body
- Dendrites
- Axon



■ Parts of a Neuron

- **Dendrites** – conducts an impulse toward the cell body.
- **Axon** – conducts impulses away from the cell body.
 - **Schwann cells** – a series of enclosed cells that make up the axon. Collectively, these Schwann cells are called the **Myelin Sheath**. The gap between nerve cells is the **synapse**.

How the Nervous System works together

What is it?

Their Job?

Receptors

Sense organ or any other organ sensitive to a stimulus

To receive a nerve impulse and send it through a conductor to the interpreter.

Conductors

The axon of the nerve cell

Carries a nerve impulse from the receptors to the effectors

How the Nervous System works together

What is it?

Their Job?

Inter-pretor

The Brain

Takes incoming messages & makes a decision and sends out a message.

Effectors

Organ or Tissue

Receives information coming from the brain & responds to a stimulus.

Stimulus → Response

Stimulus

Information received from the nervous system about the condition inside & outside the body.

Response

A reaction to a condition or a STIMULUS! To survive an organism must respond to stimuli.

2 Basic Parts of the Human Nervous System

■ Central Nervous System

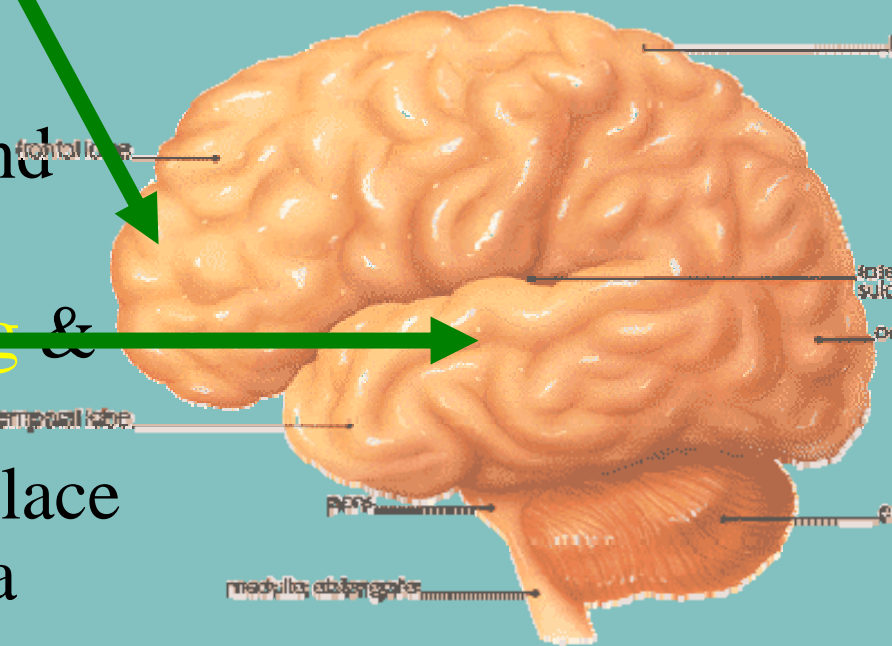
- Made up of the brain & spinal cord. The control center; coordinates body activity.

■ Peripheral Nervous System

- Made up of the nerves that carry messages to and from the central nervous system.

Lobes of the Cerebrum

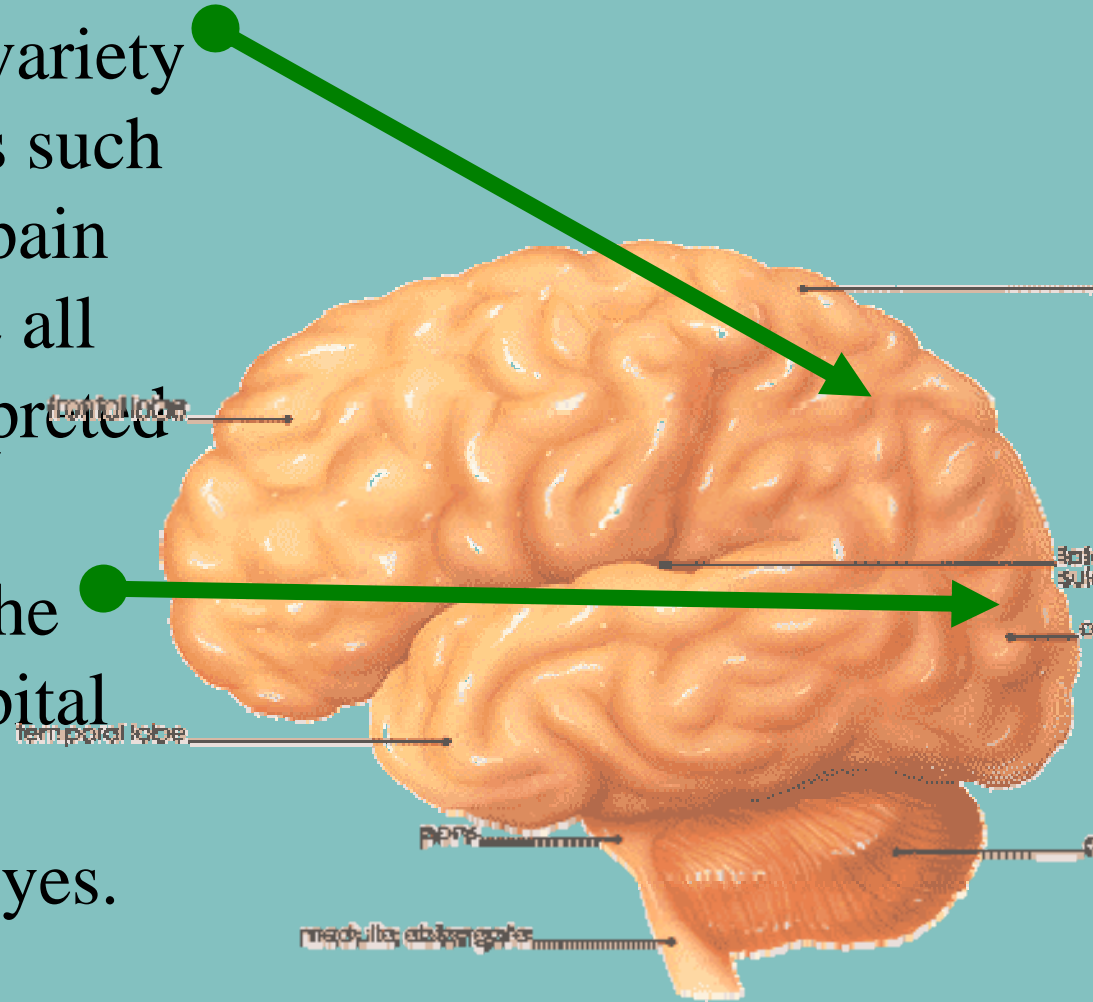
- **Frontal Lobe - Speech** production, the elaboration of **thought and emotion**, and skilled movements are controlled by neurons found in this part of the brain.
- **Temporal Lobe – Hearing &** the recognition of specific tones and loudness takes place here. This area also plays a role in **memory storage**.



Lobes of the Cerebrum

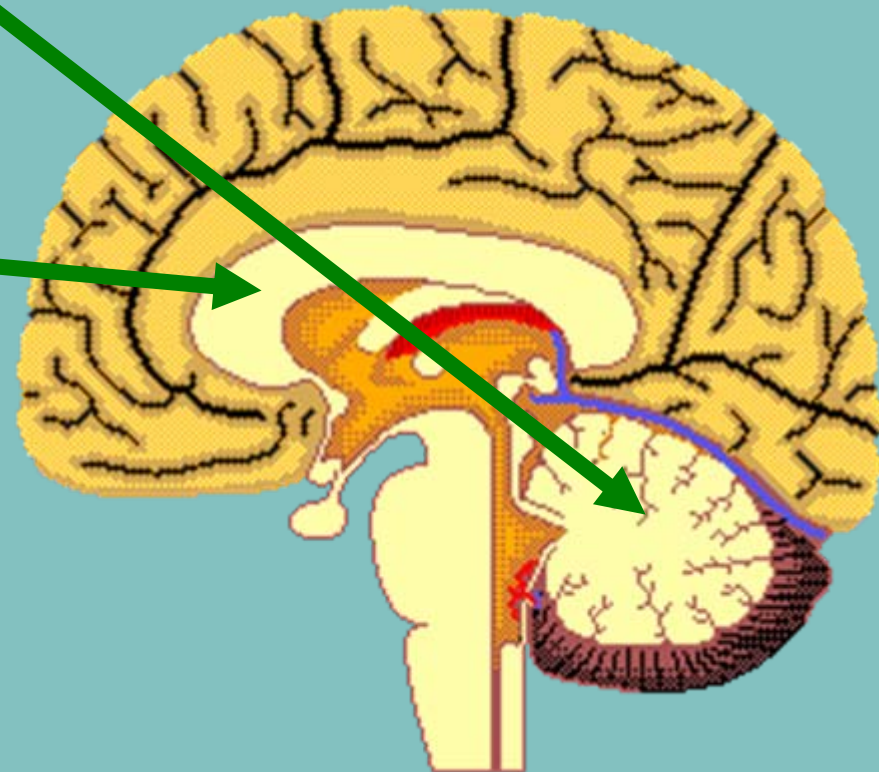
- **Parietal Lobe** - A variety of bodily sensations such as touch, pressure, pain and temperature are all perceived and interpreted here.

- **Occipital Lobe** - The neurons in the occipital lobe interpret nerve impulses from the eyes.



Central Nervous System

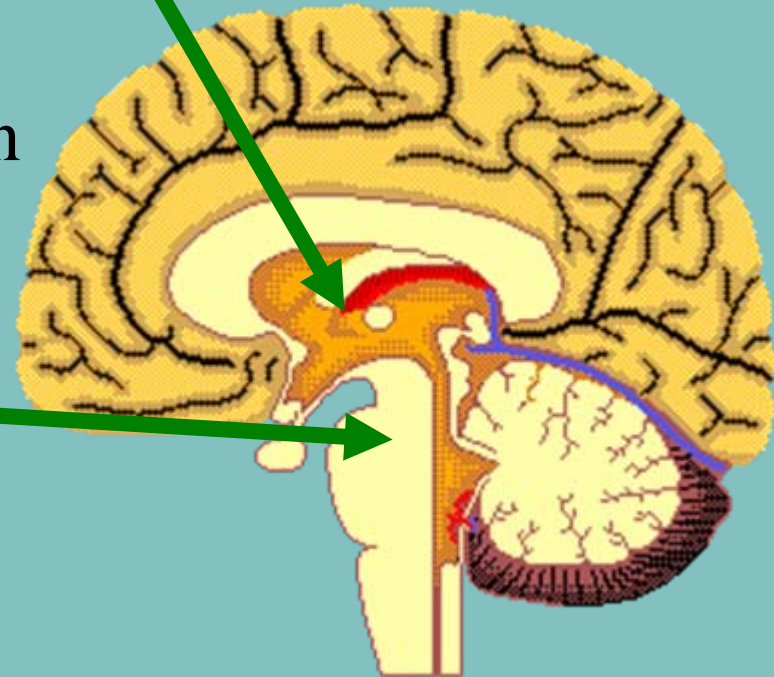
- **Cerebellum**
balance, posture & coordination.
- **Thalamus**
receives and sends sensory signals to the cerebrum.



Central Nervous System

- **Hypothalamus** – regulation of heart rate, blood pressure, body temperature, water balance; hunger, thirst and sleep; serves as a link between the nervous and endocrine system.

- **Medulla Oblongata** – controls involuntary activities such as breathing, heartbeat, swallowing & sneezing.



■ Peripheral Nervous System

- **Somatic Nervous System** – voluntary responses (ex. Walking, running).
- **Autonomic Nervous System** – involuntary responses (ex. Glands in stomach produce enzymes to break down protein).
 - Sympathetic Nervous System
 - Parasympathetic Nervous System

■ Autonomic Nervous System

- **Sympathetic Nervous System** – controls internal functions during times of stress. **“Fight or Flight”**
- **Parasympathetic Nervous System** – controls internal functions of the body at rest. **“Rest & Digest”**

PNS...

Movements called **reflexes** are not under conscious control.

- reflex arc involves 2-3 neurons
- used for quick response to danger, injury (a protective mechanism)
- brain is not involved (may interpret pain, heat, etc. after the response)

