Nervous System

Terms and Definitions:

1. **Nervous System:** The nervous system is responsible for **receiving, processing, storing,** and **transmitting** information from both inside and outside your body.

2. **Neuron:** A single nerve cell; the basic unit of the nervous system. It has:

   a) *A cell body*

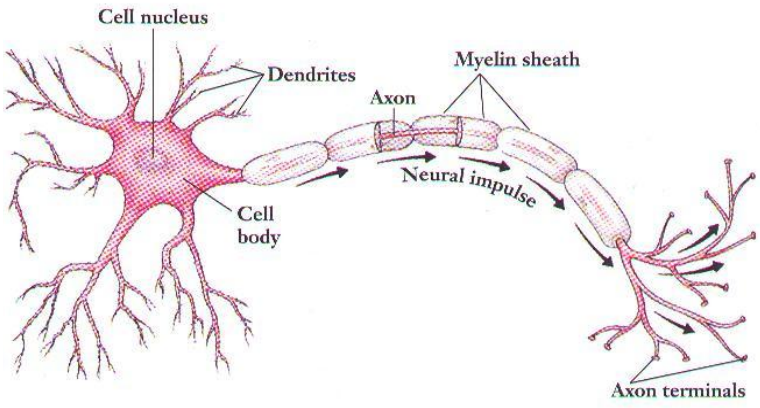
   b) *A nucleus*

   c) *Myelin sheath:*

   d) *Dendrites*: part of the neuron that carries the impulse ***towards*** from the cell body.

   e) *An axon:* a thin, long fibre that carries the impulse ***away*** from the cell body.

   f) *Axon Terminals:* the part of the neuron that forms a synapse with another neuron.



3. **Nerve:** a group of connected neurons working together to perform a similar task**.**

4. **Stimulus**: Something that triggers a reaction from us. *Example: heat is a stimulus because it causes you to react*

5. **Nerve impulse:** tiny electrical charges that move through the neurons

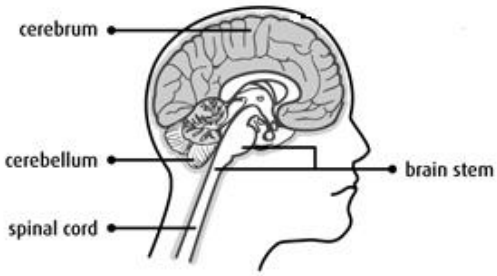
6. **Synapse:** A small gap where 2 neurons are attached. This gap allows the nerve impulse to flow from one neuron to the next.

The nervous system is made up of 3 parts:

1. Central Nervous System:

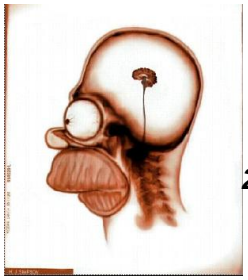
- Made up of the **brain** and **spinal cord**

  - **Brain:**
    - The control center of the entire body.
    - A large mass of nerve cells that is protect by the cranium (skull).
    - It communicates with the entire organism through a pair of nerves called *cranial nerves.*



- Includes the:

1) cerebrum



- the control center for all the voluntary movement (movement that you can control), senses, intelligence, and emotions.
- divided into 2 sides, the ***right*** controls the ***left*** side of your body, the ***left*** side controls the *right* side of your body.

2) cerebellum

- the control centre for balance and coordinating movement according to the messages it receives from all your body parts.

3) brain stem

- is attached to the spinal cord, the cerebrum, and the cerebellum.
- the control centre involuntary movement such as breathing and digesting food.

➢ **<u>Spinal Cord:</u>**

- An organ that carries information from the different parts of the body to the brain.
- Controls the **reflexes,** which is a rapid and involuntary reaction to something (*examples: you instinctively pull your hands away when you put it on a hot stove; blinking when the sunlight shines in your eyes).*
- Made up of soft tissue and 31 pairs of *spinal nerves* that branch out from the spinal cord.
- Protected by the bones of the spinal column, called the *vertebrae.*

★ **The Reflex Arc:** The simplest and most basic unit of the nervous system. It consist of five parts:

1. **Sensory Receptor:** a receptor recognizes changes in the environment (heat, light, sound) and is stimulated to start a nerve pulse.
2. **Sensory neuron:** a nerve cell that passes impulses from receptors toward or to the central nervous system
3. **Central neuron**: The nerve cell that switches the impulse from sensory “informing” neurons to sensory “acting” motor neurons.
4. **Motor neuron: a** nerve cell that carries the impulse from the central nervous system to the muscles of the body to produce a response
5. **Affector:** the muscle or organ that contracts or moves in response to the stimuli.

2. Peripheral Nervous System

The system that connects different parts of the body to the central nervous system.

3. Autonomic Nervous System:

- The system that controls those parts of the body that act without us having to think about them: the diaphragm, the stomach and the intestines, for example.
- It helps prepare the body for emergencies and then returns the body back to normal after the emergency is over.
- This system is control by our brains and involves the spinal cord and the peripheral nerves (nerves that are a part of the peripheral system)

Summary of what happens:

When your environment changes, for example, you touch a hot stove, the heat acts as a **stimulus.** This stimulus is received by a **sensory receptor** in your body, which initiates a **nerve impulse**. The nerve impulse is received by a **sensory neuron.** The nerve impulse travels through the sensory neuron via its **dendrites**, **cell body** and **axon**. It is then transmitted to another sensory neuron through a **synapse.** The role of the sensory neurons is to carry the nerve impulse to your **spinal cord** and then your **brain** (the **central nervous system**). The brain processes the nerve impulse. It contains **central neurons** that receive the nerve impulse and changing it from **sensory "informing" neurons** to **sensory "acting" motor neurons**. These motor neurons now transmitted the changed impulse from the brain, back through the spinal cord, and through the **peripheral nervous system**, where the impulse causes the **affector** to produce the appropriate response.

Interesting Facts

1. Each side of the brain controls the opposite side of the body.
2. Your brain is full grown by age 6.
3. It weighs about three pounds.
4. Your brain is made mostly of water. (85%)