THE HUMAN NERVOUS SYSTEM

3 Main Parts of the Nervous System
1. Brain
2. Spinal Cord
3. Nerves – Sensory and _____________ Nerves
The Neurone

- Nerve cells are called neurones.
- A neurone consists of a cell body (with a nucleus and cytoplasm), dendrites which carry electrical impulses to the cell, and a long axon which carries the impulses away from the cell.
- The axon of one neurone and the dendrites of the next neurone do not actually touch.
- The synapse between neurones is called the synapse.

Neuronal Function

There are 3 processes involved in nerve transmission:

1. Generation of a nerve impulse (action potential) of a sensory neurone occurs as a result of a stimulus such as light, a particular chemical or stretching of a cell membrane by sound.
2. Conduction of an impulse along a neurone occurs from the cell body to the axon.
3. A chemical transmitter substance is released across the synapse to allow the electrical impulses to pass from one neurone to the next. This substance causes the next neurone to be electrically stimulated and keeps the signal going along a nerve.

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The Central Nervous System
- The Central Nervous System comprises the parts that are enclosed and protected by bone - the Brain and the Spinal Cord.
- The Brain is composed of interconnected neurones. It is protected within the cranium or cranial.
- The Spinal Cord is a bundle of nerve fibres made of many neurones. It is protected by the vertebral column.
- Cerebro-spinal Fluid surrounds the brain and spinal cord and acts as a buffer against hard knocks or jolts.
- 3 Parts of The Brain
  1. Cerebrum (Forebrain) – the largest section of the brain, which lets us think, interpret sensory messages, carry out voluntary movements, remember and have consciousness
  2. Cerebellum (Midbrain) – helps us to keep our balance, and have repetitive muscle control
  3. Medulla Oblongata (Hindbrain or Brain Stem) – control the vital functions of heartbeat and

The Hypothalamus
- The hypothalamus is a small cluster of neurones deep within the brain. It plays a central role by regulating many vital processes (e.g. regulating body temperature, heart rate, water balance and blood pressure, carbohydrate and fat metabolism, appetite, sleep and sex drive).
- It also links the nervous system with the endocrine system, because it controls the pituitary gland which is the master gland of the system.

The Peripheral Nervous System
- This is the part of the nervous system that does not include the brain and the spinal cord.
- There are 2 types of nerves – sensory and motor nerves.
- Sensory Nerves carry information about the surroundings from the sense receptors in the skin, ears, nose and tongue along the spinal cord to the brain to be interpreted.
- Motor Nerves carry messages from the brain through the spinal cord to the muscles and other organs to produce an action.
- Some of the nerves of the peripheral nervous system are under voluntary control (e.g. ). Other nerves are involuntary or uncontrolled (e.g. regulating heartbeat).

A Reflex Arc
- A reflex arc involves transmission of a nervous impulse or message from sensory receptors to the spinal cord and back to muscles.
- Later, the message also reaches the brain for interpretation.