**Nervous System**

The human nervous system consists of:

* the **central nervous system** (CNS) – the brain and spinal cord
* the **peripheral nervous system** – nerve cells that carry information to or from the CNS



The nervous system composed of nerve cells, or **neurones**:

|  |
| --- |
| **Motor Neurone**:* Efferent Neuron – Moving toward a central organ or point
* Relays messages from the brain or spinal cord to the muscles and organs

http://www.biologymad.com/nervoussystem/motorneurone.jpg |

|  |
| --- |
| **Sensory Neurone**: * Afferent Neuron – Moving away from a central organ or point
* Relays messages from receptors to the brain or spinal cord

http://www.biologymad.com/nervoussystem/sensoryneurone.jpg |

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| **Intermediate (relay neurone):*** Relays message from sensory neurone to motor neurone
* Make up the brain and spinal cord

http://www.biologymad.com/nervoussystem/relayneurone.jpg |

**Receptors to effectors**

The diagram summarises how information flows from receptors to effectors in the nervous system.



**Receptors**

**Receptors** are groups of specialised cells. They can detect a change in the environment ([stimulus](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/2#glossary-z3nk6sg)) and produce electrical impulses in response. Sense organs contain groups of receptors that respond to specific [stimuli](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/2#glossary-znmwtfr).

| **Sense organ** |  **Stimulus** |
| --- | --- |
| Skin |  Touch, temperature |
| Tongue |  Chemicals (in food and drink, for example) |
| Nose |  Chemicals (in the air, for example) |
| Eye |  Light |
| Ear |  Sound |

**Effectors**

**Effectors** are parts of the body - such as muscles and glands - that produce a response to a detected stimulus. For example:

* a muscle contracting to move an arm
* muscle squeezing saliva from the salivary gland
* a gland releasing a [hormone](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/2#glossary-zn8bd2p) into the blood

This diagram summarises how information flows from receptors to effectors in the nervous system.



**Reflex actions**

A **reflex action** is a way for the body to automatically and rapidly respond to a stimulus to minimise any further damage to the body. It follows this general sequence and does not involve the brain:

stimulus → receptor → sensory neurone → relay neurone → motor neurone → effector → response

The nerve pathway followed by a reflex action is called a **reflex arc**. For example, a simple reflex arc happens if we accidentally touch something hot.



1. Receptor in the skin detects a stimulus (the change in temperature).
2. [Sensory neurone](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/3#glossary-z9qwtfr) sends impulses to [relay neurone](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/3#glossary-zr9cq6f).
3. [Motor neurone](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/3#glossary-z8r387h) sends impulses to effector.
4. [Effector](http://www.bbc.co.uk/education/guides/zkdnb9q/revision/3#glossary-zj9y9j6) produces a response (muscle contracts to move hand away).