Chapter 10: The human nervous system

Knowledge organiser

The nervous system

Function
The nervous system enables humans to react to their surroundings and to coordinate their behaviour – this includes both voluntary and **involuntary** actions.

Structure
The nervous system is made up of the **central nervous system** (CNS) and a network of nerves. The CNS comprises the **brain** and **spinal cord**.

Factors affecting reaction time

- tiredness
- distractions
- caffeine
- alcohol

Nervous system responses

Stimulus	Receptor	Coordinator	Effector	Response
a change in the environment (**stimulus**) is detected by **receptors**	information from receptors passes along cells (**neurones**) to the CNS as electrical impulses	the CNS coordinates the body's response to the stimulus	effectors bring about a response, such as glands secreting hormones or muscles contracting	the body responds to the stimulus

Key terms

Make sure you can write a definition for these key terms.

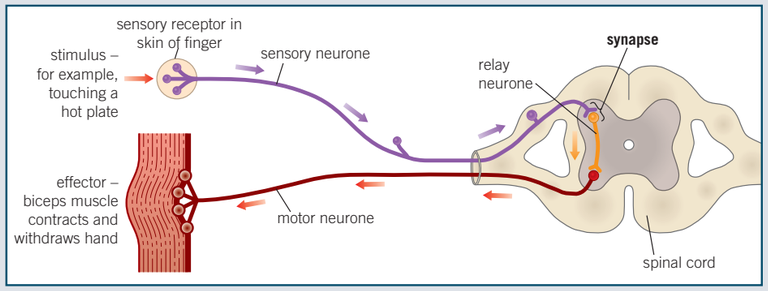
central nervous system effectors involuntary neurones receptors reflex action spinal cord stimulus synapse

Reflex arcs

The nervous system is made up of the **central nervous system** (CNS) and a network of nerves. The CNS comprises the brain and spinal cord.

Reflex actions of the nervous system are automatic and rapid – they do not involve the conscious part of the brain.

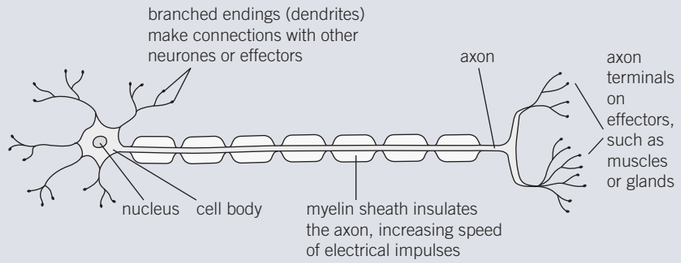
Reflex actions are important for survival because they help prevent damage to the body.



Reflex arc structures

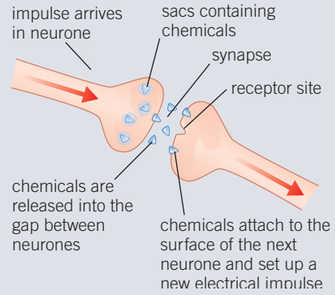
Neurones

Neurones carry electrical impulses around the body – relay neurones connect sensory neurones to motor neurones



Synapses

Synapses are gaps between neurones, which allow electrical impulses in the nervous system to cross between neurones



Homeostasis

Homeostasis is the regulation of internal conditions (of a cell or whole organism) in response to internal and external changes, to maintain optimum conditions for functioning.

This maintains optimum conditions for all cell functions and enzyme action.

In the human body, this includes control of

- blood glucose concentration
- body temperature
- water levels

The automatic control systems of homeostasis may involve nervous responses or chemical responses.
All control systems involve

- receptor cells, which detect stimuli (changes in the environment)
- coordination centres (such as the brain, spinal cord, or pancreas), which receive and process information from receptors
- effectors (muscles or glands), which produce responses to restore optimum conditions.

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Retrieval questions

Learn the answers to the questions below then cover the answers column with a piece of paper and write as many as you can. Check and repeat.

	B10 questions	Answers
1	What is the function of the nervous system?	it enables organisms to react to their surroundings and coordinates behaviour
2	What are the two parts of the central nervous system?	brain and spinal cord
3	Why are reflex actions described as rapid and automatic?	they do not involve the conscious part of the brain
4	Why are reflex actions important?	for survival and to prevent damage to the body
5	Give the pathway of a nervous response.	stimulus → receptor → coordinator → effector → response

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