What is Nervous System Organization?

Worksheet

Nervous system organization divides the body's neural control into the central nervous system (brain and spinal cord) and the peripheral nervous system (all nerves outside it, further split into somatic and autonomic branches).

Questions

1. Which structures make up the CNS?

A) Cranial and spinal nerves
B) Brain and spinal cord
C) Sympathetic ganglia
D) Sensory receptors

2. The autonomic nervous system is a subdivision of

A) The CNS
B) The somatic nervous system
C) The peripheral nervous system
D) The skeletal system

3. Which branch prepares the body for 'fight or flight'?

A) Parasympathetic
B) Sympathetic
C) Somatic
D) Central

4. A reflex like pulling your hand from a hot object is processed mainly by

A) The brain only
B) The spinal cord
C) The autonomic ganglia
D) The skin

5. You touch a hot stove and pull your hand back before you even feel pain. Which parts of the nervous system are involved?

6. During a stressful exam, your heart races and palms sweat. Which nervous system division causes this?

7. A person has a spinal cord injury at the neck. Predict the effect on voluntary movement of the legs and explain using CNS/PNS organization.

8. Define: What are the two main divisions of the nervous system?

9. Define: What does the somatic nervous system control?

10. Define: What does the autonomic nervous system control?

Answer Key

1. B) Brain and spinal cord - The CNS consists of the brain and spinal cord - the body's integration center.

2. C) The peripheral nervous system - The autonomic nervous system is part of the PNS and controls involuntary organ functions.

3. B) Sympathetic - The sympathetic branch increases heart rate and alertness in stressful situations.

4. B) The spinal cord - Simple reflex arcs are processed in the spinal cord for a faster response than waiting for the brain.

5. Sensory neurons in the PNS detect heat and send a signal to the spinal cord. The spinal cord (CNS) processes it as a reflex arc, without waiting for the brain. Motor neurons in the PNS carry the response back to the arm muscles - this is a spinal reflex.

6. This is the 'fight or flight' response. It is controlled by the sympathetic branch of the autonomic nervous system (part of the PNS). Sympathetic activation increases heart rate and sweating to prepare the body for action.

7. The spinal cord is part of the CNS and relays signals between the brain and the body. A neck injury blocks signals traveling down to the legs' peripheral nerves. Even though the PNS nerves to the legs are intact, the CNS relay is broken, so voluntary leg movement is lost (paralysis).

8. The central nervous system (CNS: brain + spinal cord) and the peripheral nervous system (PNS: all other nerves).

9. Voluntary movements of skeletal muscles.

10. Involuntary functions like heart rate, digestion, and breathing.