Lesson Description

In this lesson we:

- Explain the need for a nervous system in humans
- State that the brain and spinal cord are protected by meninges
- State the location and provide the functions of the following parts:
  - Cerebrum
  - Cerebellum
  - Corpus callosum
  - Medulla oblongata
  - Spinal cord
- State the location and provide the functions of the peripheral nervous system
- State the location and provide the functions of autonomic nervous system (sympathetic and parasympathetic)
- Identify and state the functions of each of the following parts on:
  - Sensory and motor neurons: nucleus, cell body, cytoplasm, myelin
  - Sheath, axon and dendrites
- Explain the causes and symptoms of the following disorders of the nervous system:
  - Alzheimer’s Disease
  - Multiple Sclerosis
- Describe consequences of possible brain and spinal injuries and mention stem cell research and the possibility of repairing injuries
- List the negative effects of drugs on the central nervous system

Summary
Left-hand side - Brain

Central nervous system

Peripheral nervous system
Multiple Sclerosis

- Injuries and possible treatment
- Negative effects of drugs on the nervous system
Test Yourself

Select the most correct answer from the options given. Write down only the correct letter.

**Question 1**
What are the main parts of the central nervous system?
A. brain and vagus nerve  
B. spinal nerves and spinal cord  
C. spinal cord and brain  
D. brain and cranial nerves

**Question 2**
Which of the following does NOT play a role in the protection of the brain and spinal cord?
A. Meninges.  
B. Cerebrospinal fluid.  
C. Bone tissue.  
D. Nerves.

**Question 3**
The autonomic nervous system conducts impulses to…
A. the voluntary muscles and glands.  
B. the involuntary muscles and glands.  
C. brain.  
D. spinal cord.

**Question 4**
Which part of the brain is most important to your recall of information for success on this task?
A. Cerebellum  
B. Cerebrum  
C. Medulla Oblongata  
D. Corpus calossum

**Question 5**
Which of the following is not a part of a neuron?
A. Dendrite  
B. Axon  
C. Ventral cleft  
D. Myelin sheath
Question 6

Indicate whether each of the statements in COLUMN I applies to A only, B only, both A and B or none of the items in COLUMN II. Write A only, B only, both A and B or none next to the question number.

<table>
<thead>
<tr>
<th>COLUMN I</th>
<th>COLUMN II</th>
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| 1        | The part of the brain controlling basic body functions such as heart rate and breathing rate when you just finished running | A: Cerebellum  
B: Cerebrum |
| 2        | The part of a neuron that transmits impulses to the cell body | A: Axon  
B: Dendrite |
| 3        | The reaction of the body to an emergency is controlled by the ________ nervous system. | A: Sympathetic  
B: Parasympathetic |
| 4        | Part of the nervous system that controls voluntary movement | A: Autonomic  
B: Sympathetic |
| 5        | Converts stimulus to impulse | A: Receptor  
B: Effector |

Question 7

Give the correct biological term for each of the following descriptions. Write only the term next to the question number.

a.) The chemical that moves from the axon of one neuron across a gap to the dendrite of another  
b.) The cells that make up the nervous system  
c.) Protective covering of axons and dendrites  
d.) Part of the brain that controls all voluntary actions  
e.) Part of the brain responsible for communication between the brain and spinal cord  
f.) Part of the brain that maintains muscle tone and posture  
g.) Structure that transmits impulses from receptors to CNS  
h.) Structure that transmits impulses from CNS to effectors

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**Improve your Skills**

**Question 1**

1.1 Name the part of the nervous system that connects the organs of the body to the CNS.  
1.2 Name the two parts of the Autonomic Nervous System  
1.3 List the functions of the sympathetic nervous system.
Question 2

Study the diagram representing the structure of the human brain below.

![The structure of the human brain](image)

2.1 Is the above a cross section or a longitudinal section of the brain? (1)

2.2 Identify the parts labelled:
   a) B
   b) A (2)

2.3 Write down the LETTER (A to F) of the part which controls the breathing rate. (2)

2.4 Explain how part A and C are related in function.

2.5 List the functions of part labelled D.

2.6 Listed below are characteristics and functions of parts of the central nervous system of humans:
   A – perceives sensations
   B – regulates heartbeat
   C – co-ordinates skeletal muscular movement
   D – white matter on the outside and grey matter on the inside
   E – grey matter on the outside and white matter on the inside
   F – connects the two cerebral hemispheres
   G – responsible for breathing rate
   H – allows one to remember information
   I – is protected by the vertebral column

From the list above choose and write down ONLY the letter/s which refer to:

i) The cerebrum
ii) The cerebellum
iii) The spinal cord
iv) The corpus callosum
v) Medulla oblongata
Question 3
A person puts their finger on a pin. A reflex action causes them to pull their hand away quickly. The diagram shows the structures involved in this reflex action.

3.1 Provide labels for structure 1, tissue 2 and neuron 3 and organ 4. (4)
3.2 Draw a labelled diagram to illustrate neuron 5. (5)
3.3 Predict what would happen if neuron 3 snapped when this person fell from a building. (3)

Question 4
Write explanatory notes about Alzheimer’s and Multiple Sclerosis in terms of causes, nature of the disorder and possible treatment.

Question 5
The nervous and endocrine systems help to protect the human body. Describe how this is achieved through a reflex action using a suitable example.

Links
- Learn Xtra Live 2013: https://www.youtube.com/watch?v=lydJT6lUe0k
- Learn Xtra Lesson: https://www.youtube.com/watch?v=FwcDH5qJhE
- Multiple Sclerosis video, MS symptoms: https://www.youtube.com/watch?v=PtmuaSVHYLM
- What is Alzheimer's disease? https://www.youtube.com/watch?v=9Wv9jrk-gXc