

The brain

Revision notes · The cerebral hemispheres, cerebellum and medulla oblongata, how CT and PET scans investigate the brain, and why treating nervous system damage is hard.

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0. **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

The brain

Spec 2.10B-2.12B

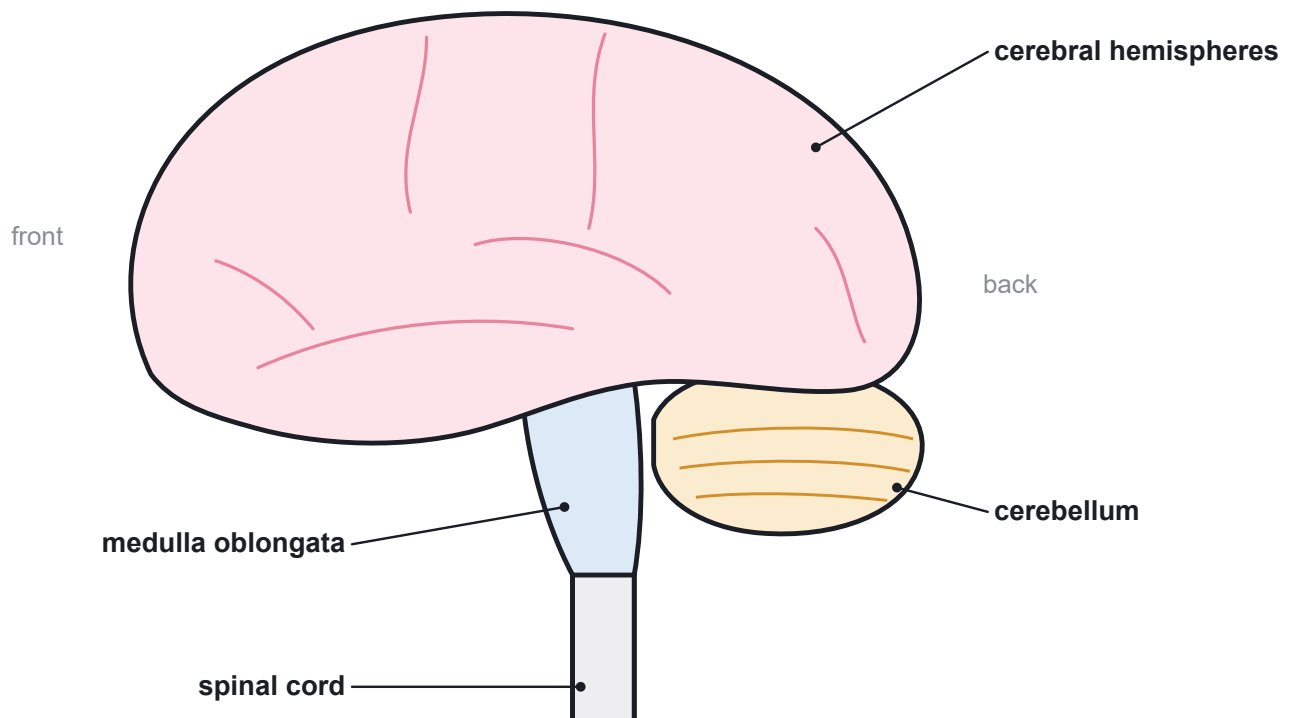
Triple only

Structures and functions of the brain

Spec 2.10B

The **brain** is part of the central nervous system. Different regions have different functions.

Regions of the brain	
Region	Function
Cerebral hemispheres	The left and right halves of the largest part of the brain. They are involved in conscious thought, intelligence, memory and language.
Cerebellum	Coordinates movement and helps to control balance.
Medulla oblongata	Controls unconscious activities, such as heart rate and breathing rate.



The three regions of the brain you need: **cerebral hemispheres**, **cerebellum** and **medulla oblongata**.

Exam tip: Learn one function for each region. The medulla oblongata controls the activities you do not think about.

Investigating the brain with scans Spec 2.11B

The brain is inside the skull and is very delicate. It is difficult and risky to get at brain tissue to find out how it works or what is wrong. Scanning allows doctors to investigate the brain without surgery.

CT and PET scans	
Scan	How it helps
CT scan	Uses X-rays taken from many angles to build up images of the brain. It shows the structure, so it can reveal damage or a tumour.
PET scan	A radioactive tracer is put into the body. Active areas of the brain use more of it, so the scan shows which areas are active. It shows brain function.

Both methods let scientists and doctors link areas of the brain to their functions and find the cause of problems, without opening the skull.

Exam tip: CT shows structure and PET shows function. Say what each one shows, and that the benefit is not having to access the brain by surgery.

Limitations in treating nervous system damage Spec 2.12B

Treating damage and disease in the brain and other parts of the nervous system is difficult.

- The brain is complex and delicate, and it is difficult to reach inside the skull. Surgery risks damaging healthy tissue.
- Neurones in the central nervous system do not easily repair themselves, so damage is often permanent.
- In a **spinal injury**, the spinal cord is damaged, so impulses cannot pass the damaged region. This can cause paralysis and loss of feeling below the injury. The damage is very difficult to repair.
- A **brain tumour** may be in a place where it cannot be removed safely. Treatments may also damage healthy brain tissue around it.

Exam tip: To explain a limitation, say what is difficult and why. For example: neurones in the spinal cord do not easily repair, so the paralysis can be permanent.

Quick check

1. What does the cerebellum do?
2. What does the medulla oblongata control?
3. Name one function of the cerebral hemispheres.
4. Which part of the brain would be involved in learning a new language?

Quick check answers

The brain

1. It coordinates movement and helps to control balance.
2. Unconscious activities such as heart rate and breathing rate.
3. Any one of: consciousness, intelligence, memory, language.
4. The cerebral hemispheres.