

The brain

4.5.2.2 · Homeostasis and response · revision notes

The main regions of the brain, what each one does. Expect labelling and recall questions.
This subtopic is in GCSE Biology only, not Combined Science.

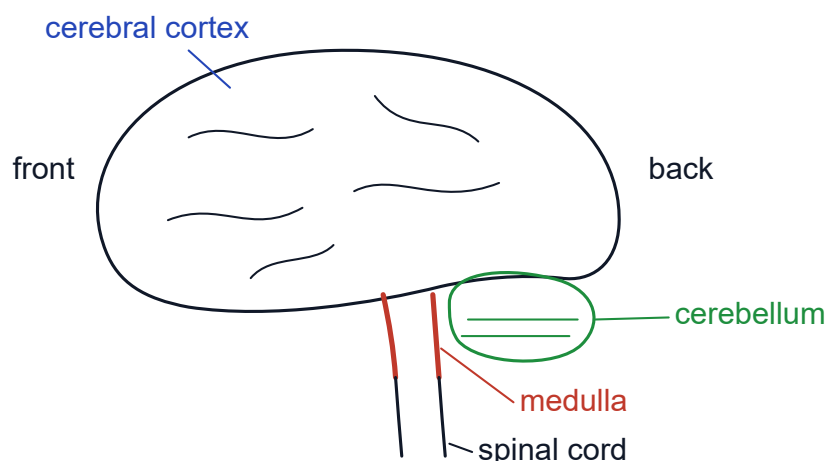
Key facts

- Brain = billions of interconnected neurones; controls complex behaviour
- Cerebellum: coordination of muscular activity (e.g. balance)
- Cerebral cortex: consciousness, intelligence, memory, language
- Medulla: unconscious activities, e.g. heart rate and breathing

Notes

Structure of the brain

- The brain controls **complex behaviour**. It is made of **billions of interconnected neurones**.
- Different regions of the brain carry out different functions.
- Cerebral cortex**: the large, folded outer layer. It is responsible for **consciousness, intelligence, memory and language**.
- Cerebellum**: at the back of the brain, below the cerebral cortex. It coordinates **muscular activity**, such as balance and smooth, precise movement.
- Medulla**: at the base of the brain, where it joins the spinal cord. It controls **unconscious activities** such as heart rate and breathing rate.



The brain from the side: cerebral cortex, cerebellum and medulla.

How to answer each type of question

Name the region from its function

1 mark each

Grade 4

1. Thinking, memory, language or consciousness: cerebral cortex.
2. Balance and coordination of muscles: cerebellum.
3. Heart rate, breathing and other unconscious activities: medulla.

Example. Name the part of the brain that:

- (a) controls breathing rate
- (b) is responsible for language and memory
- (c) coordinates muscular activity.

Model answer. (a) Medulla (1)

(b) Cerebral cortex (1)

(c) Cerebellum (1)

Don't lose marks

- ✗ Mixing up cerebellum and cerebral cortex because the names look alike.
- ✗ Saying the medulla controls conscious actions. It controls unconscious ones, such as heart rate.
- ✗ In evaluate questions, giving only risks or only benefits, or leaving out a conclusion.

More tips

Memory tricks

- Cerebral Cortex = Clever and Conscious: thinking, memory, language.
- Cerebellum = balance: picture a tightrope walker.
- Medulla = the automatic 'maintenance' part: heart and breathing keep going without you thinking.

Exam technique

- Practise labelling a simple brain diagram until it is automatic: these are quick marks.
- For 'suggest' questions about damage, state the region's function first, then the effect in context.
- In 'evaluate' questions, give both sides and finish with a justified conclusion.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3

Label the three main brain regions

Identify the cerebral cortex, cerebellum and medulla on a diagram of the brain.

Grade 4

State the function of each region

Cerebral cortex: consciousness, intelligence, memory, language. Cerebellum: coordinates muscles. Medulla: unconscious activities.

