Your notes

GCSE Biology: revision notes

The brain and the eye

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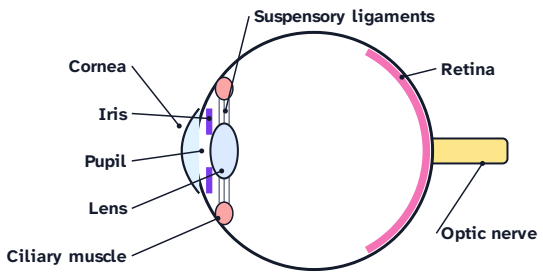
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The brain

- The brain controls complex behaviour. It is made of billions of interconnected neurones and has different regions for different jobs.
- The **cerebral cortex** is responsible for consciousness, intelligence, memory and language.
- The **cerebellum** coordinates muscle activity and balance.
- The **medulla** controls unconscious activities such as heart rate and breathing.
- Scientists study the brain using patients with brain damage, electrical stimulation of different areas and MRI scans. Treating brain damage and disease is difficult because the brain is complex and delicate.

Parts of the eye

- The **retina** contains receptor cells sensitive to light intensity and colour.
- The optic nerve carries impulses from the **retina** to the brain.
- The sclera is the tough white outer layer; the **cornea** is the transparent front part that refracts light into the eye.
- The **iris** controls the size of the pupil and so how much light enters the eye.
- **Ciliary muscles** and **suspensory ligaments** change the shape of the lens to focus light on the **retina**.



Accommodation

- To focus on a near object, the **ciliary muscles** contract, the **suspensory ligaments** loosen, and the lens becomes thicker so it refracts light more.
- To focus on a distant object, the **ciliary muscles** relax, the **suspensory ligaments** are pulled tight, and the lens is pulled thin so it refracts light less.

Vision problems

- **Myopia** (short-sightedness): distant objects look blurred because light is focused in front of the **retina**. It is corrected with concave lenses.
- **Hyperopia** (long-sightedness): near objects look blurred because light is focused behind the **retina**. It is corrected with convex lenses.
- Treatments include glasses, hard and soft contact lenses, laser surgery to change the shape of the **cornea**, and replacing the lens.

Key terms

Cerebral cortex	The part of the brain responsible for consciousness, intelligence, memory and language.
Cerebellum	The part of the brain that coordinates muscle activity.
Medulla	The part of the brain that controls unconscious activities such as breathing and heart rate.
Retina	The layer at the back of the eye containing light-sensitive receptor cells.
Cornea	The transparent front of the eye that refracts light.
Iris	The coloured ring of muscle that controls the size of the pupil.
Ciliary muscles	Muscles that change the shape of the lens.
Suspensory ligaments	Fibres that connect the ciliary muscles to the lens.
Accommodation	Changing the shape of the lens to focus on near or distant objects.
Myopia	Short-sightedness, corrected with a concave lens.
Hyperopia	Long-sightedness, corrected with a convex lens.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which part of the brain controls heart rate and breathing?
2. Which part of the brain coordinates muscle activity?
3. Which part of the brain is responsible for memory and language?
4. What does the iris do?

Your notes

5. What happens to the lens when you look at a near object?
6. When looking at a distant object, what do the ciliary muscles do?
7. What type of lens corrects short-sightedness (myopia)?
8. Where is light focused in a long-sighted (hyperopic) eye?

Answers

1. Medulla
2. Cerebellum
3. Cerebral cortex
4. Controls the size of the pupil
5. It becomes thicker
6. Relax
7. Concave lens
8. Behind the retina

What to do next

Practise 11 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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