

Edexcel Biology GCSE Topics 2.15B to 2.17B - The eye (Biology only)

Flashcards

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Identify the structures of the eye labelled in the diagram below









Identify the structures of the eye labelled in the diagram below

A = cornea

- B = iris
- C = ciliary muscle
- D = lens
- E = suspensory ligaments
- F = retina
- G = optic nerve









Outline the structure and function of the cornea







Outline the structure and function of the cornea

- Transparent outer covering of the eye
- Refracts light entering the eye







Outline the structure and function of the iris







Outline the structure and function of the iris

- Pigmented ring of circular muscles and radial muscles
- Controls the size of the pupil to alter how much light enters the eye







What is the pupil?







What is the pupil?

A hole in the iris centre that allows light rays to enter the eye







Outline the structure and function of the lens







Outline the structure and function of the lens

- Transparent, bi-convex structure
- Suspensory ligaments attach the lens to a ring of ciliary muscle
- Refracts light, focusing it onto the retina







What is the function of the ciliary muscles and suspensory ligaments?







What is the function of the ciliary muscles and suspensory ligaments?

Change the shape of the lens (accomodation) to focus light onto the retina







Outline the structure and function of the retina







Outline the structure and function of the retina

- Light sensitive layer composed of rod and cone cells
- Converts light energy into neural signals which are sent to the brain via the optic nerve







What are rod cells?







What are rod cells?

Cells in the retina that are sensitive to low light intensity (dim light)







What are cone cells?







What are cone cells?

Cells found in the retina that are sensitive to high light intensity (bright light) and can detect different colours.







What is the function of the optic nerve?







What is the function of the optic nerve?

It transmits nerve impulses to the brain from the retina.







Describe how dim light affects the size of the pupil







Describe how dim light affects the size of the pupil

- Light receptors detect dim light
- Circular muscles relax
- Radial muscles contract
- Pupil dilates
- More light enters the pupil







Describe how bright light affects the size of the pupil







Describe how bright light affects the size of the pupil

- Light receptors detect bright light
- Circular muscles contract
- Radial muscles relax
- Pupil contracts
- Less light enters the pupil







Why is the iris reflex important?







Why is the iris reflex important?

It prevents bright light from damaging the retina.







What is accommodation?







What is accommodation?

- Process by which the elastic lens changes its shape (with the aid of ciliary muscles and suspensory ligaments) to focus on near or distant objects
- Light is focused onto the retina







Describe how the eye focuses on near objects







Describe how the eye focuses on near objects

- Near object
- Ciliary muscles contract
- Suspensory ligaments slacken
- Lens becomes more convex (more rounded)
- Light is refracted more
- Light rays focused onto the retina







Describe how the eye focuses on distant objects







Describe how the eye focuses on distant objects

- Distant object
- Ciliary muscles relax
- Suspensory ligaments tighten
- Lens becomes less convex (less rounded)
- Light is refracted less
- Light rays focused onto the retina







What is long-sightedness?







What is long-sightedness?

Can focus on distant objects clearly Cannot focus on near objects







What are the causes of long-sightedness?







What are the causes of long-sightedness?

- Eyeball is too short
- Lens is less elastic (usually age-related)
- Light rays are not focussed onto the retina, instead converging behind the retina







How is long-sightedness treated?







How is long-sightedness treated?

- Using a convex lens (causes light rays to converge) in glasses or contact lenses
- Replacement lenses
- Laser eye surgery







What is short-sightedness?







What is short-sightedness?

Can focus on near objects clearly Cannot focus on distant objects







What are the causes of short-sightedness?







What are the causes of short-sightedness?

- Eyeball is too long
- Lens is too thick and too rounded
- Light rays are not focussed onto the retina, instead converging in front of the retina







How is short-sightedness treated?







How is short-sightedness treated?

- Using a concave lens (causes light rays to diverge) in glasses or contact lenses
- Replacement lenses
- Laser eye surgery







What are cataracts?







What are cataracts?

- A cloudy patch forms on the lens of the eye which negatively affects vision
- Vision becomes blurry, difficult to see the intensity of colours, problems with glare etc.







How are cataracts treated?







How are cataracts treated?

The clouded lens is exchanged for a synthetic lens during surgery.







What is colour-blindness?







What is colour-blindness?

- A deficiency of the eye that makes it difficult to distinguish between colours
- e.g. individuals with red-green colour blindness have difficulty differentiating between red and green







What is the cause of colour-blindness?







What is the cause of colour-blindness?

Damage to cone cells in the retina



