

AQA Biology GCSE

5.2 - Human Nervous System

Flashcards

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What is the function of the nervous system?



What is the function of the nervous system?

The nervous system allows the body to react to its surroundings and coordinate an appropriate response.



How does a stimulus lead to a response being carried out by the body?



How does a stimulus lead to a response being carried out by the body?

- Stimulus is converted into an electrical impulse by the receptors.
- The electrical impulse passes along sensory neurones to the central nervous system (CNS).
- The CNS coordinates an appropriate response and an electrical impulse is sent along motor neurones to the effector, which carries out the response.



What sequence of events describes how the nervous system works?



What sequence of events describes how the nervous system works?

Stimulus → receptor → coordinator →
effector → response



What is a reflex action?



What is a reflex action?

A reflex action is an automatic and rapid response which does not involve any conscious input from the brain.



Why are reflex actions important?



Why are reflex actions important?

Reflex actions aid survival by preventing harm to the body.



Describe how a reflex action occurs via a reflex arc



Describe how a reflex action occurs via a reflex arc

- The stimulus is detected by a receptor.
- An electrical impulse passes along a sensory neurone to the spinal cord (part of the CNS).
- At a synapse between a sensory neurone and a relay neurone, a chemical diffuses across the gap and stimulates a new impulse which passes along the relay neurone.
- The same process occurs at a synapse between a relay neurone and a motor neurone.
- At the effector, an appropriate response is carried out.



What is the difference between a reflex pathway and a conscious pathway?



What is the difference between a reflex pathway and a conscious pathway?

Within a reflex pathway, the coordination centre is a relay neurone found in the spinal cord/unconscious parts of the brain. In a conscious pathway, the coordination centre is in the conscious part of the brain.

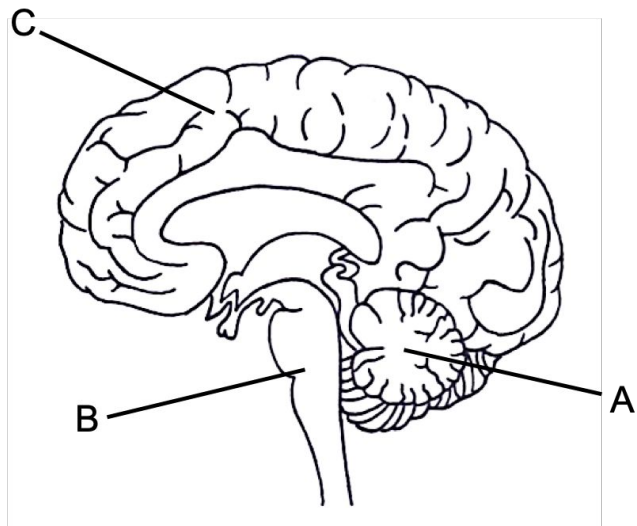


What is the function of the cerebral cortex?
(biology only)



What is the function of the cerebral cortex? (biology only)

C - controls consciousness, intelligence, memory and language.



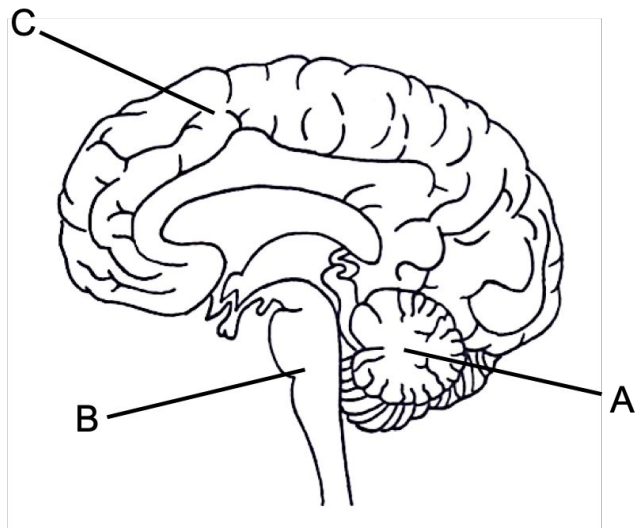
What is the function of the cerebellum?
(biology only)



What is the function of the cerebellum?

(biology only)

A - controls muscular coordination



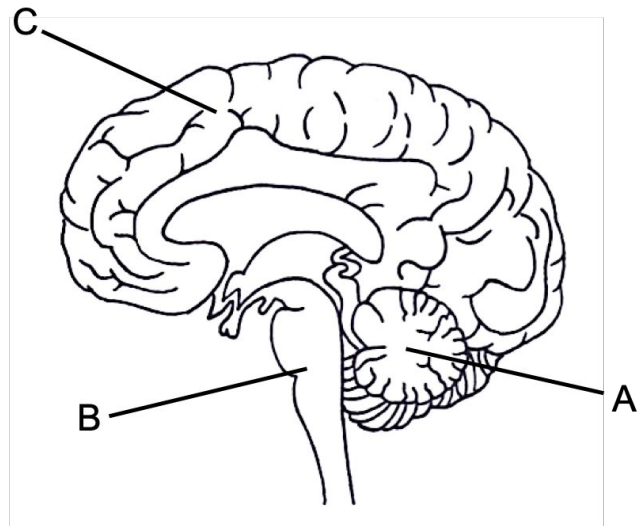
What is the function of the medulla?
(biology only)



What is the function of the medulla?

(biology only)

B - controls
unconscious
activities eg.
breathing, heart rate



Why is the investigation and treatment of the brain difficult?

(biology only) (higher only)



Why is the investigation and treatment of the brain difficult? (biology only) (higher only)

- The brain is a complex and delicate organ.
- The brain is easily damaged and destroyed.
- Certain membranes prevent drugs from reaching the brain.
- The exact function of each part of the brain is not known.



What methods are used by scientists to determine
brain function?
(biology only) (higher only)



What methods are used by scientists to determine brain function? **(biology only) (higher only)**

- Studying patients with brain damage
- Electrical stimulation of the brain
- MRI scans



What stimuli are the receptors of the eye
sensitive to?
(biology only)



What stimuli are the receptors of the eye sensitive to? **(biology only)**

Light intensity and colour



What are the two main functions of structures
found within the eye?
(biology only)



What are the two main functions of structures found within the eye? (biology only)

- Focusing on near or distant objects - accommodation.
- Adaptation to dim light.



Describe the structure and function of the retina

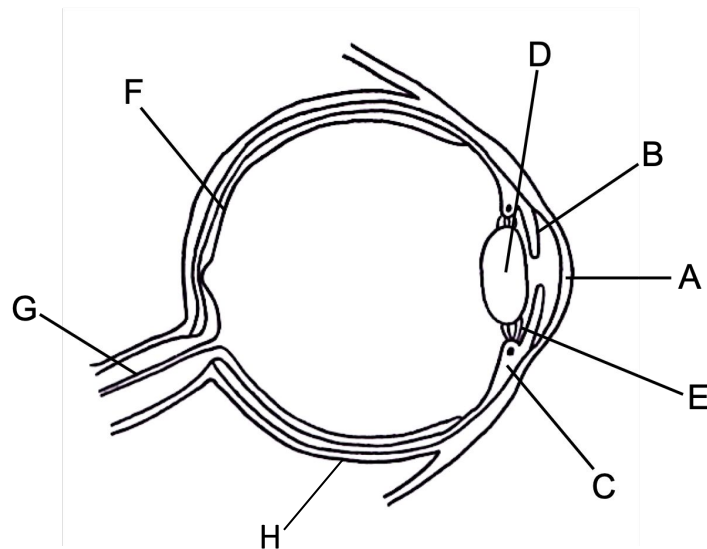
(biology only)



Describe the structure and function of the retina (biology only)

F - The retina is a light-sensitive layer found at the back of the eye.

Light stimulates the retinal cells, resulting in impulses being sent to the brain.



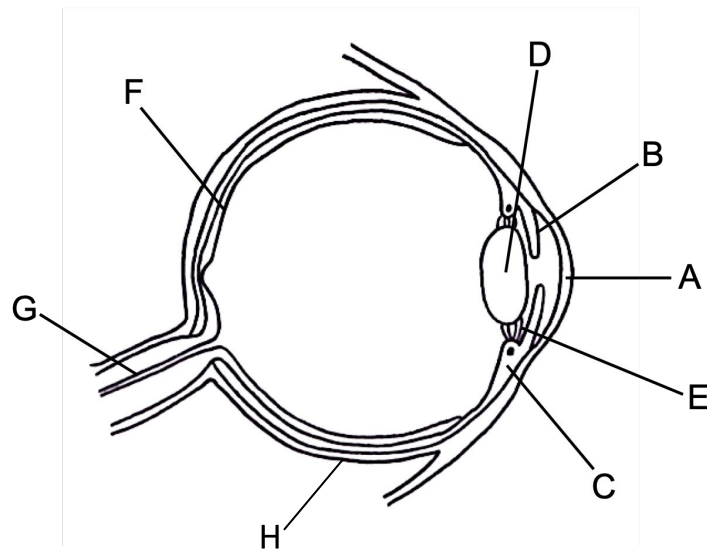
Describe the structure and function of the optic nerve (biology only)



Describe the structure and function of the optic nerve (biology only)

G - The optic nerve connects the eye and the brain.

It carries impulses to the brain so that an image can be visualised.

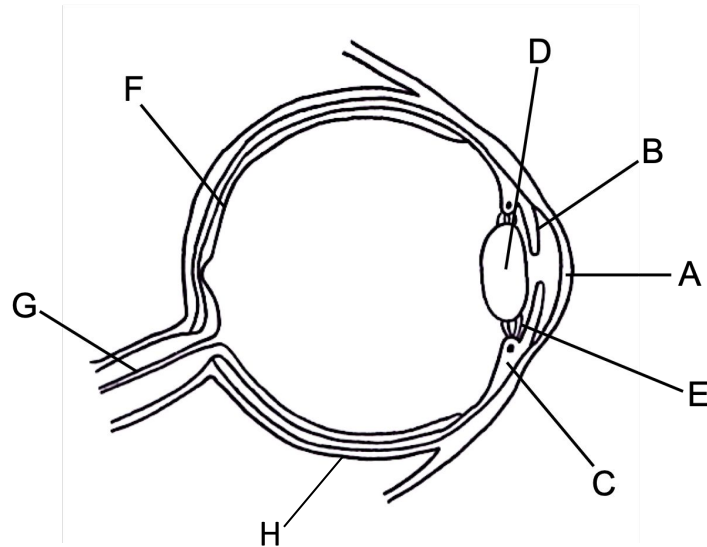


Describe the structure and function of the sclera (biology only)



Describe the structure and function of the sclera (biology only)

H - The sclera is the tough outer layer of the eye which protects its internal structures.



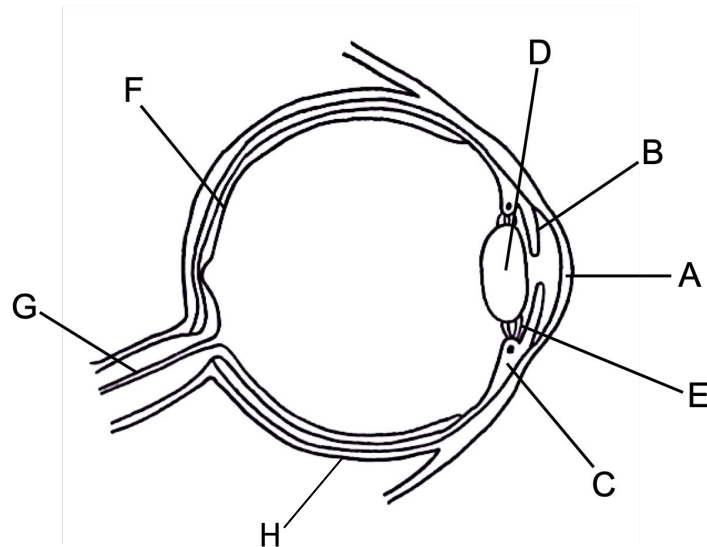
Describe the structure and function of the cornea (biology only)



Describe the structure and function of the cornea (biology only)

A - The cornea is the curved transparent layer at the front of the eye.

It lets light into the eye and allows light to be focused onto the retina.

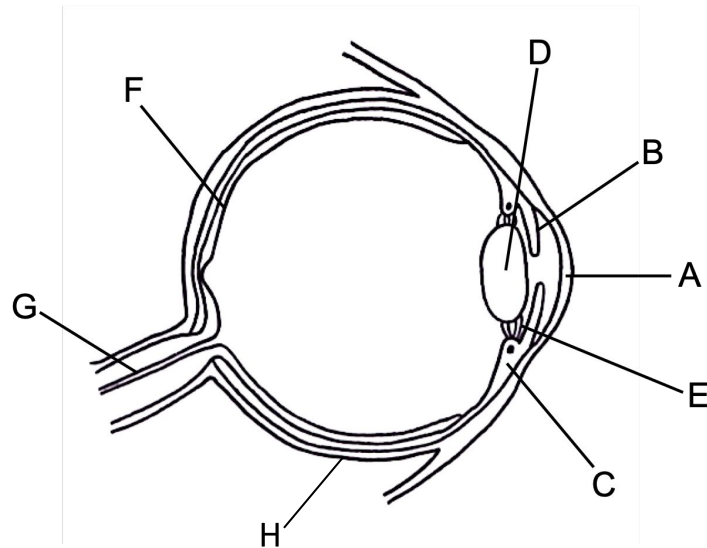


Describe the structure and function of the iris (biology only)



Describe the structure and function of the iris **(biology only)**

B - The iris is a muscle which controls the size of the pupil by contracting or relaxing. This allows the eye to adjust to bright and dim lighting

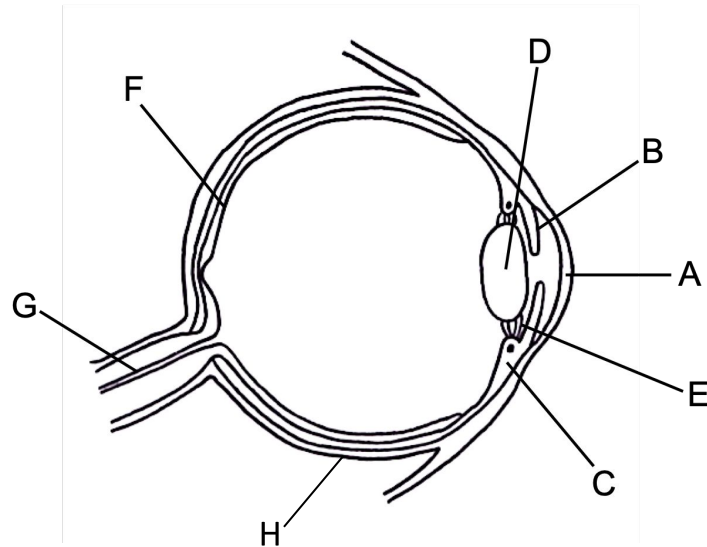


Describe the structure and function of the ciliary muscles and suspensory ligaments
(biology only)



Describe the structure and function of the ciliary muscles and suspensory ligaments (**biology only**)

The ciliary muscles (C) and suspensory ligaments (E) hold the lens in place and control its shape.



Describe how the iris alters the size of the pupil
in both bright and dim light
(biology only)



Describe how the iris alters the size of the pupil in both bright and dim light (**biology only**)

- Bright light: circular muscles contract and radial muscles relax - makes pupil smaller to avoid retinal damage.
- Dim light: circular muscles relax and radial muscles contract - makes pupil larger so more light can enter the eye.



What is accommodation? (biology only)



What is accommodation? (biology only)

Accommodation is the alteration of the lens' shape in order to focus on near or distant objects.



How does the eye focus on a nearby object? (biology only)



How does the eye focus on a nearby object? (biology only)

- Ciliary muscles contract.
- Suspensory ligaments loosen.
- Lens becomes thicker and more curved - light rays are refracted strongly.



How does the eye focus on a far away object? (biology only)



How does the eye focus on a far away object? (biology only)

- Ciliary muscles relax
- Suspensory ligaments tighten
- Lens becomes thinner - light rays are refracted weakly



What is myopia? (biology only)



What is myopia? (biology only)

Myopia (short-sightedness) usually occurs when the lens of the eye is too curved. As a result, light is focused in front of the retina so images appear blurry.



How can myopia be treated? (biology only)



How can myopia be treated? (biology only)

Myopia can be treated using glasses with a concave lense, which spreads out light rays so they can be focused on the retina.



What is hyperopia?

(biology only)



What is hyperopia? (biology only)

Hyperopia (long-sightedness) usually occurs when the lens of the eye is too flat. As a result, light is focused behind the retina so images appear out of focus.



How can hyperopia be treated? (biology only)



How can hyperopia be treated? (biology only)

Hyperopia can be treated using glasses with a convex lense, which brings the light rays together so they can be focused on the retina



What are the two types of contact lenses?
(biology only)



What are the two types of contact lenses?

(biology only)

Contact lenses are lenses that are placed on the eye.

There are two types:

- Hard - rigid material, last a long time, must be kept sterile.
- Soft - flexible material, last for a shorter time, more comfortable.



What is laser eye surgery? (biology only)



What is laser eye surgery? (biology only)

Laser eye surgery is the use of lasers to fix visual defects in adults. To treat myopia, lasers reduce the thickness of the cornea so light is refracted less strongly. To treat hyperopia, lasers alter the curvature of the cornea so that light is refracted correctly.



How can replacement lenses be used to treat visual defects? (biology only)



How can replacement lenses be used to treat visual defects? **(biology only)**

A replacement lens can either be implanted into the eye (along with the natural lens) or it may replace the natural lens altogether. Risks of lens replacement include retinal damage, cataracts and infections.



What are the risks of lens replacement? (biology only)



What are the risks of lens replacement? (biology only)

Risks of lens replacement include retinal damage, cataracts and infections



Where is body temperature controlled in the
body?
(biology only)



Where is body temperature controlled in the body?
(biology only)

Body temperature is controlled by the thermoregulatory centre in the hypothalamus of the brain.



How is temperature monitored by the body? (biology only)



How is temperature monitored by the body? (biology only)

- Thermoregulatory centre has receptors sensitive to blood temperature.
- Skin has receptors sensitive to skin temperature - sends impulses to thermoregulatory centre.



What physiological changes occur when the
body temperature is too high?
(biology only)



What physiological changes occur when the body temperature is too high? (biology only)

- Vasodilation - blood vessels near the surface of the skin dilate - more heat is radiated away.
- Sweating - evaporation of water takes away heat energy from the surface of the skin.



What physiological changes occur when the
body temperature is too low?
(biology only)



What physiological changes occur when the body temperature is too low? (biology only)

- Vasoconstriction - blood vessels near the surface of the skin constrict - less heat radiated away.
- Shivering - respiration allows muscles to contract. It is an exothermic process, so heat energy is released.
- Sweating stops.

