CAIE Biology IGCSE

14 - Coordination and Response

Flashcards

What is a nerve impulse?

What is a nerve impulse?

An electrical signal that passes along nerve cells (neurones)

What is the difference between the central nervous system and the peripheral nervous system?

What is the difference between the central nervous system and the peripheral nervous system?

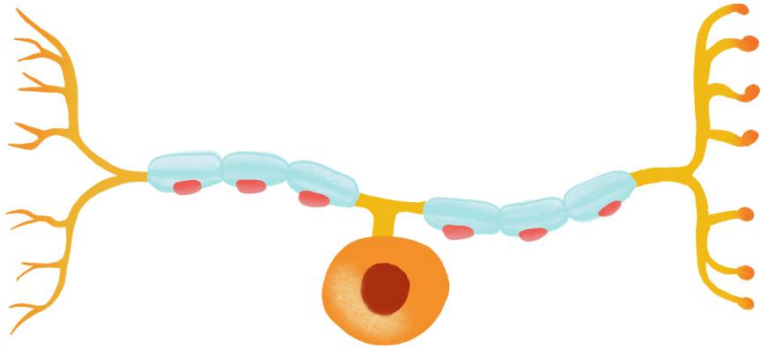
The central nervous system is the brain and the spinal cord, the peripheral nervous system is every other part of the nervous system

What is an involuntary action?

What is an involuntary action?

An action completed without conscious thought

Name the neurone shown below



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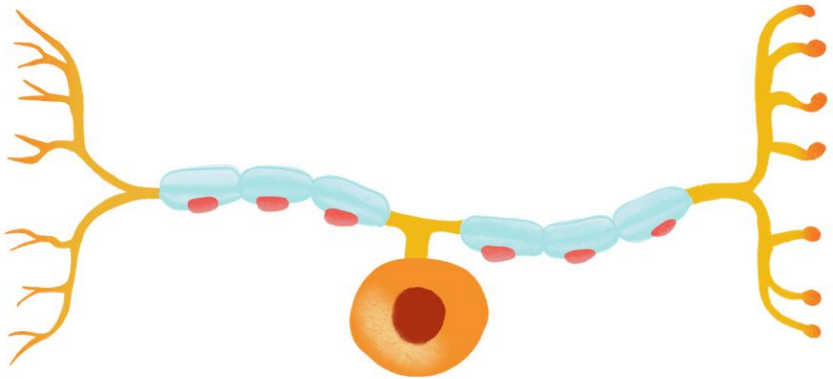
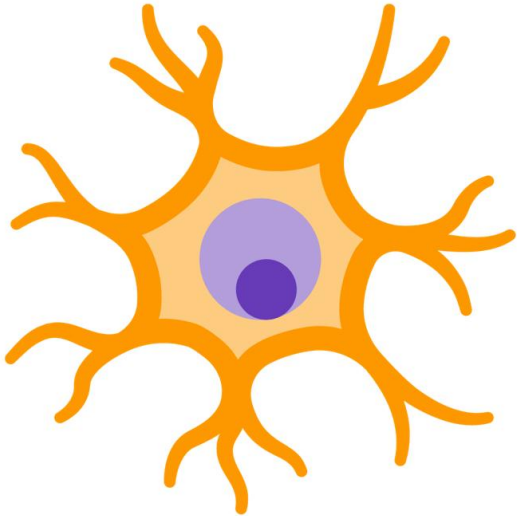


SENSORY NEURONE

Name the neurone shown below



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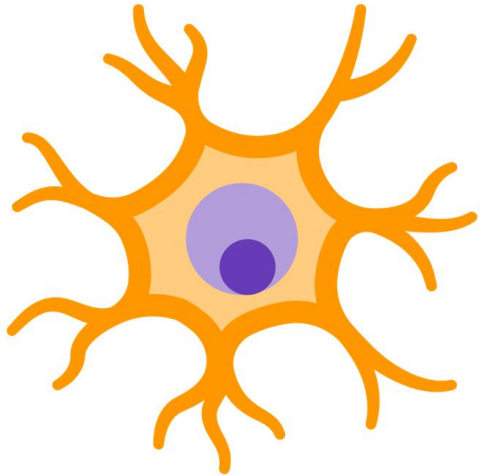
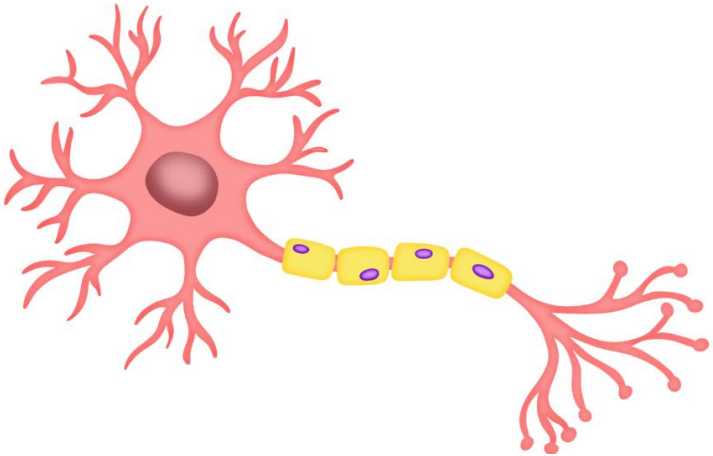


RELAY NEURONE

Name the neurone shown below



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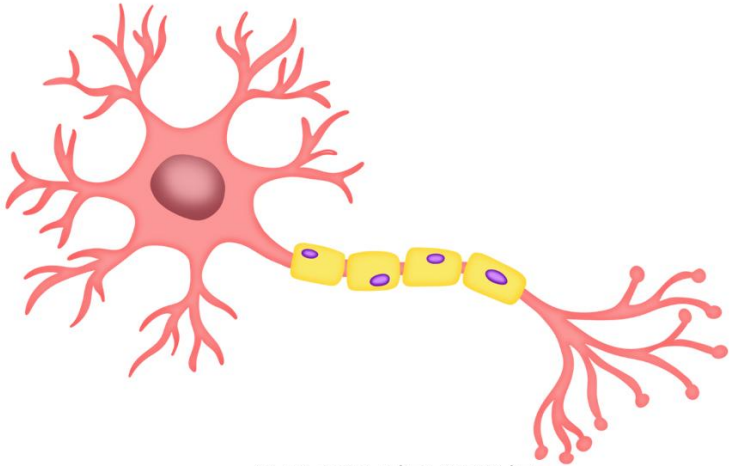


Describe the reflex arc

Describe the reflex arc

1. Stimulus detected by a receptor
2. Impulse passed along sensory neurone to relay neurones in the CNS
3. Impulse passed along motor neurone to effector
4. Effector brings about the response

What is a reflex action?

What is a reflex action?

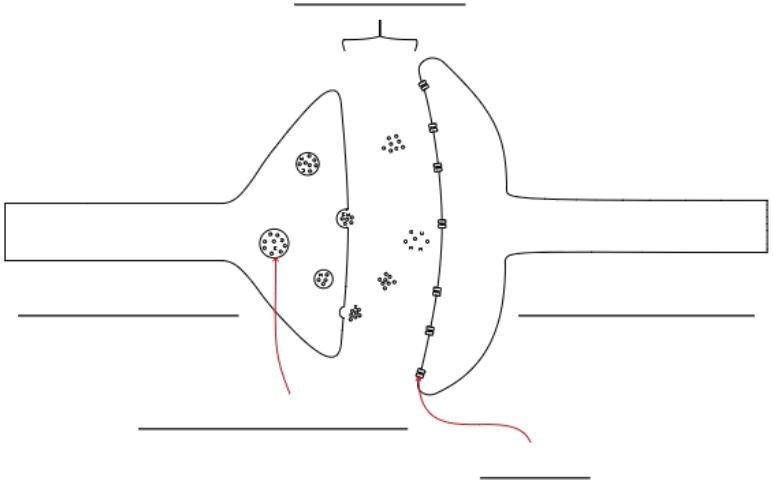
A rapid response to a stimulus by an effector (muscle or gland)

What is a synapse?

What is a synapse?

A junction between two neurones

Label this diagram of a synapse (Higher/Supplement)



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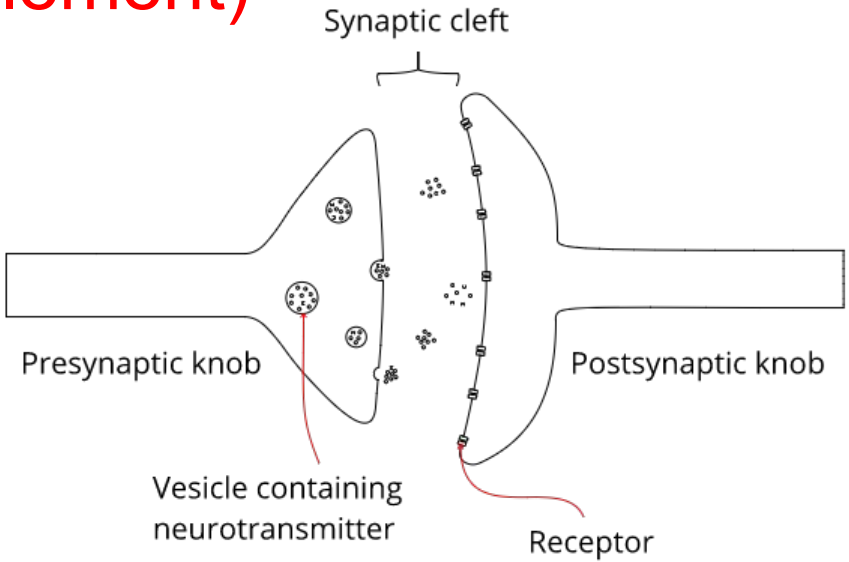


How is an impulse transmitted between two neurones? (Higher/Supplement)

How is an impulse transmitted between two neurones? (Higher/Supplement)

- The impulse reaches the end of one neurone
- Vesicles release neurotransmitter into the synaptic gap
- The neurotransmitter diffuses across the gap and binds to receptors in the membrane of the next neurone
- A new impulse is triggered in the next neurone

What is the purpose of synapses? (Higher/Supplement)

What is the purpose of synapses? (Higher/Supplement)

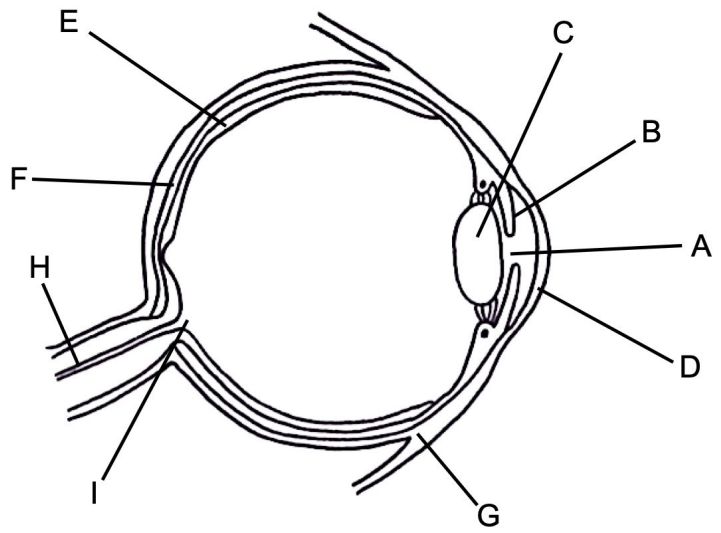
To ensure that impulses travel in one direction only

What are sense organs?

What are sense organs?

Groups of cells that detect changes in the environment

Identify the structures of the eye labelled in the diagram below



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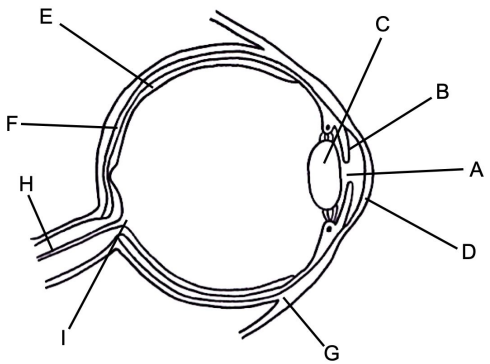


A	pupil	**F**	choroid
B	iris	**G**	sclera
C	lens	**H**	optic nerve
D	cornea	**I**	blind spot
E	retina		

What is the cornea and what is its function?

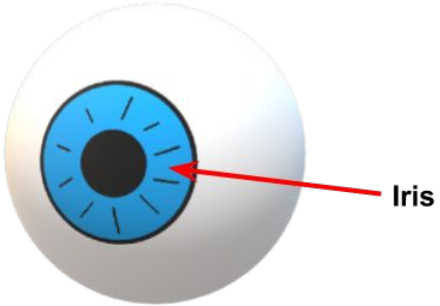
What is the cornea and what is its function?

The transparent layer in front of the eye that protects the eye from damage

What is the iris and what is its function?

What is the iris and what is its function?

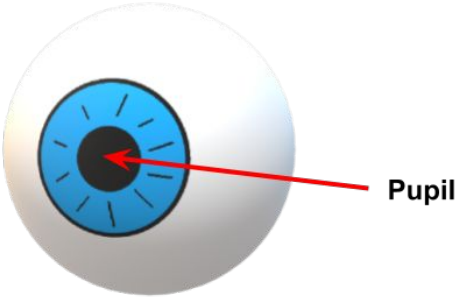
The coloured ring around the pupil that controls its diameter



What is the pupil and what is its function?

What is the pupil and what is its function?

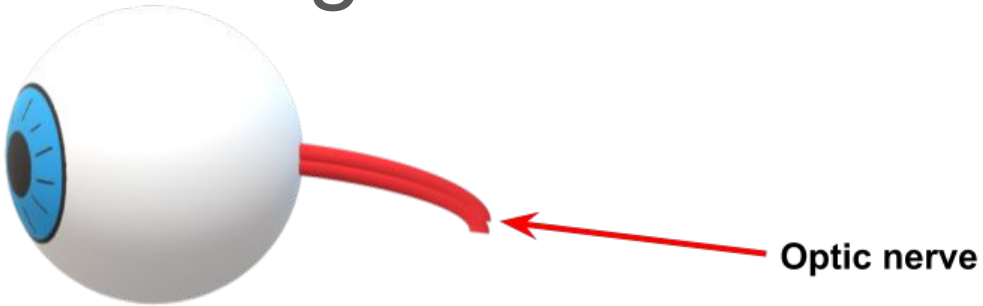
The pupil is the hole in the middle of the iris that lets light into the eye



What is the optic nerve and what is its function?

What is the optic nerve and what is its function?

The nerve coming out the back of the eye that sends signals to the brain



What is the function of the lens?

What is the function of the lens?

The lens focuses the light rays onto the retina

State the response of the eye to bright light

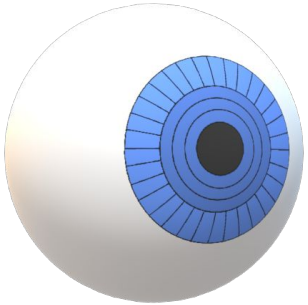
State the response of the eye to bright light

The pupil decreases in diameter to let less light in

Explain the response of the eye to bright light (Higher/Supplement)

Explain the response of the eye to bright light (Higher/Supplement)

The circular muscle contracts and the radial muscle relaxes, making the pupil smaller



State the response of the eye to a lack of light

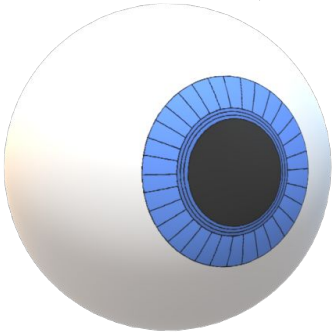
State the response of the eye to a lack of light

The pupil increases in diameter to let more light in

Explain the response of the eye to a lack of light (Higher/Supplement)

Explain the response of the eye to a lack of light (Higher/Supplement)

The radial muscle contracts and the circular muscle relaxes, making the pupil larger



Explain how the eye focuses on distant objects (Higher/Supplement)

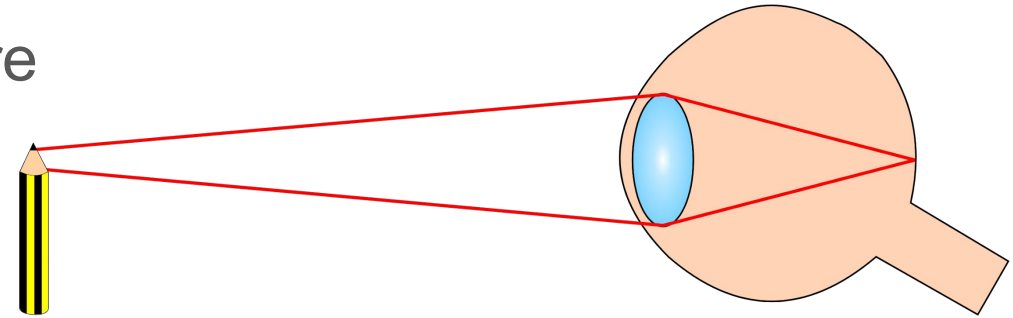
Explain how the eye focuses on distant objects (Higher/Supplement)

- The ciliary muscles relax and the suspensory ligaments tighten
- The lens becomes thinner
- Light is refracted less

Explain how the eye focuses on nearby objects (Higher/Supplement)

Explain how the eye focuses on nearby objects (Higher/Supplement)

- The ciliary muscles contract and the suspensory ligaments loosen
- The lens becomes thicker
- Light is refracted more



Describe the distribution of rods and cones in the human eye (Higher/Supplement)

Describe the distribution of rods and cones in the human eye (Higher/Supplement)

Mostly more rods than cones in the eye however in the fovea there are more cones than rods

What is the fovea?
(Higher/Supplement)

What is the fovea? (Higher/Supplement)

An area on the retina with lots of photosensitive cells so it has the highest visual acuity

What is the function of rods? (Higher/Supplement)

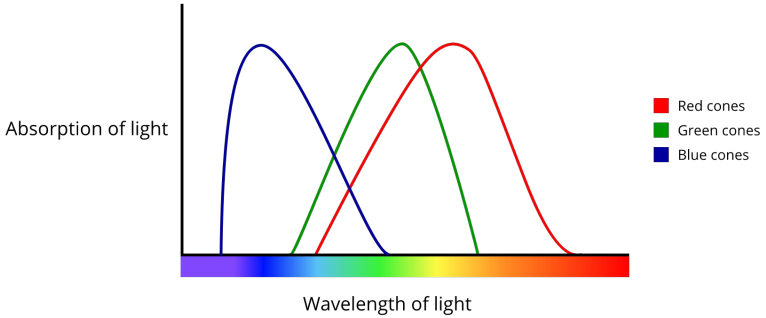
What is the function of rods? (Higher/Supplement)

They function in low light intensities

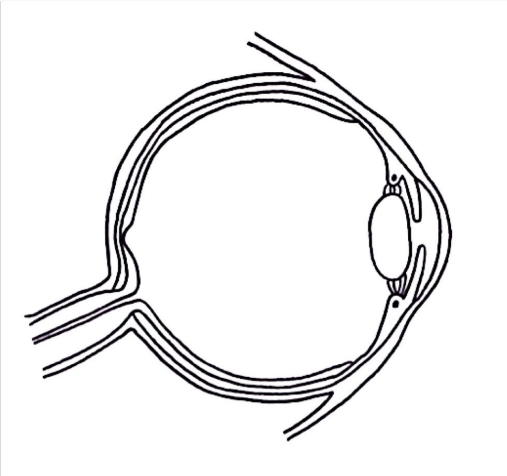
What is the function of cones? (Higher/Supplement)

What is the function of cones? (Higher/Supplement)

There are 3 different types of cone cells that all help to detect colour



Identify the fovea on the diagram below (Higher/Supplement)



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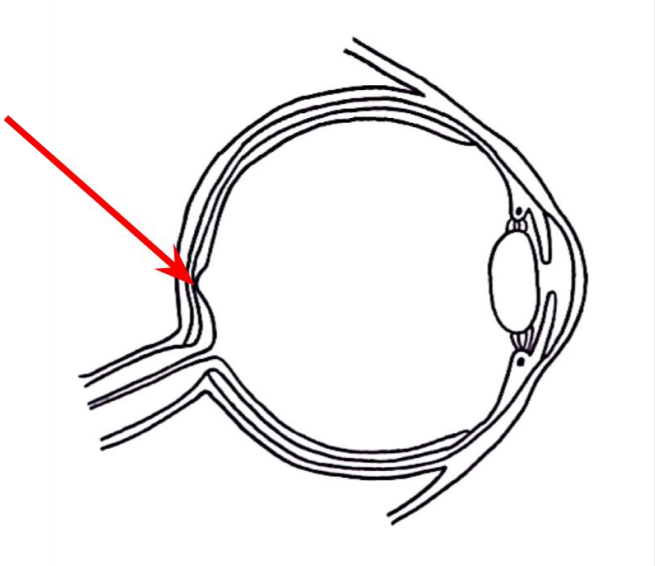


What is a hormone?

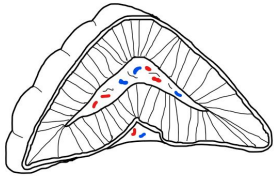
What is a hormone?

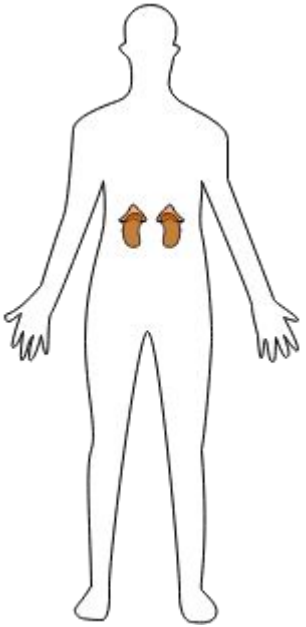
A chemical secreted by a gland into the blood that brings about an affect on one or more target organs

Where are the adrenal glands located?

Where are the adrenal glands located?

Behind the kidneys





What hormone do the adrenal glands secrete?

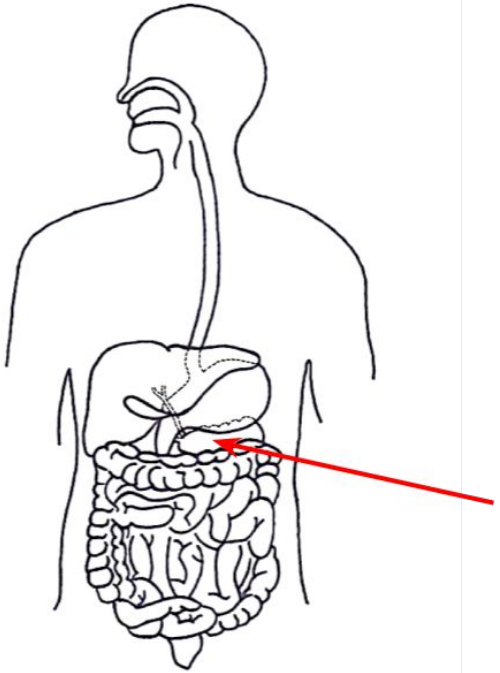
What hormone do the adrenal glands secrete?

Adrenaline

Where is the pancreas located?

Where is the pancreas located?

Behind the stomach



What hormone does the pancreas secrete?

What hormone does the pancreas secrete?

Insulin

What hormone do the testes secrete?

What hormone do the testes secrete?

Testosterone

What hormone do the ovaries secrete?

What hormone do the ovaries secrete?

Oestrogen

When is adrenaline secreted?

When is adrenaline secreted?

During ‘fight or flight’ situations

Give 3 effects of adrenaline

Give 3 effects of adrenaline

- Widens pupils
- Increases heart rate
- Increases breathing rate

Give 3 examples when adrenaline secretion increases

Give 3 examples when adrenaline secretion increases

- During scary situations
- During stressful situations
- During exciting situations

How does adrenaline cause an increase in blood glucose concentration? (Higher/Supplement)

How does adrenaline cause an increase in blood glucose concentration? (Higher/Supplement)

- It travels in the blood to the liver
- It binds to receptors on the liver cells and causes a cascade which causes glycogen to be broken down into glucose which enters the blood

Give 2 differences between the nervous system and the hormonal system

Give 2 differences between the nervous system and the hormonal system

Nervous	Hormonal
Fast to take effect	Slow to take effect
Short lasting	Long lasting

What does oestrogen do?

What does oestrogen do?

Oestrogen causes the uterus lining to thicken

What does testosterone do?

What does testosterone do?

- Main male sex hormone
- Involved in growth of testes and penis
- Triggers many changes in males during puberty (hair growth, deeper voice, increased muscle mass)

What does insulin do in the body?

What does insulin do in the body?

Insulin decreases blood glucose concentration

Define homeostasis

Define homeostasis

Maintaining a constant internal environment

Define homeostasis (Higher/Supplement)

Define homeostasis (Higher/Supplement)

Maintaining a constant internal environment within set limits despite external change

What mechanism is used to achieve homeostasis?

(Higher/Supplement)

What mechanism is used to achieve homeostasis? (Higher/Supplement)

A negative feedback mechanism

What does insulin do in the body?

What does insulin do in the body?

Insulin decreases blood glucose concentration

What does glucagon do in the body? (Higher/Supplement)

What does glucagon do in the body? (Higher/Supplement)

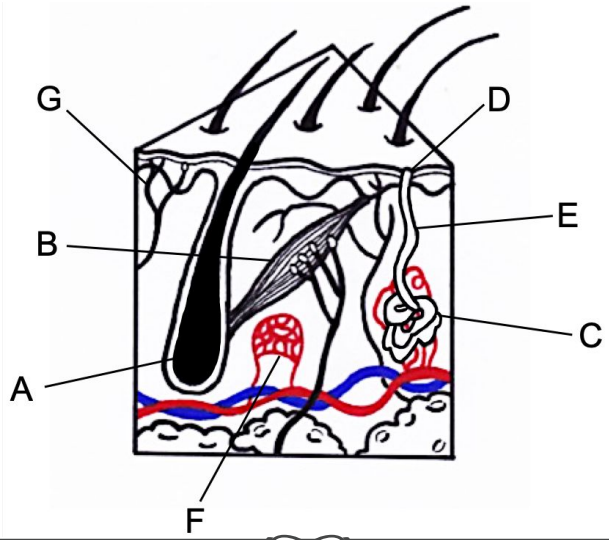
Glucagon increases blood glucose concentration by increasing the conversion of glycogen to glucose in the liver

Give 3 methods for treating type 1 diabetes (Higher/Supplement)

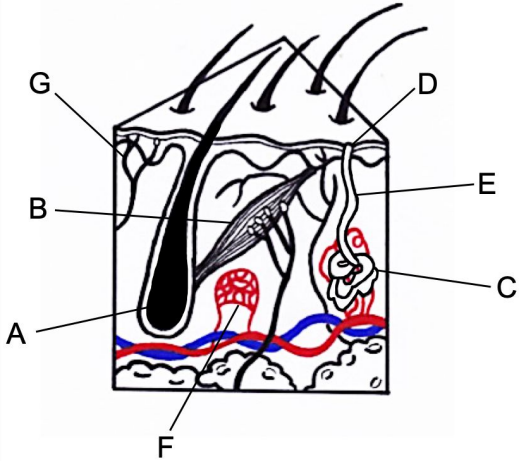
Give 3 methods for treating type 1 diabetes (Higher/Supplement)

- Insulin injections
- Diet monitoring
- Pancreas transplant

Identify the structures of the skin labelled in the diagram below (Higher/Supplement)



Identify the structures of the skin labelled in the diagram below (Higher/Supplement)



A	hair follicle	**E**	sweat duct
B	erector muscle	**F**	blood capillaries
C	sweat gland	**G**	nerve fibre
D	sweat pore		

Give 2 processes involving the skin that cool the body down (Higher/Supplement)

Give 2 processes involving the skin that cool the body down (Higher/Supplement)

1. Sweating - Cools the body by evaporation
2. Vasodilation - Allows blood to flow closer to the surface of the skin where it can cool

Give 3 processes that work to keep the body warm (Higher/Supplement)

Give 3 processes that work to keep the body warm (Higher/Supplement)

- Vasoconstriction
- Shivering
- Erection of hairs on the skin

Describe the process of vasodilation (Higher/Supplement)

Describe the process of vasodilation (Higher/Supplement)

- The body detects a rise in temperature
- Blood vessels supplying the capillaries at the skin surface dilate (the muscles in the vessels relax)
- More blood flows closer to the skin where it can cool

Describe the process of vasoconstriction (Higher/Supplement)

Describe the process of vasoconstriction (Higher/Supplement)

- The body detects a drop in temperature
- Blood vessels supplying the capillaries at the skin surface constrict (the muscles in the vessels contract)
- Less blood flows closer to the skin surface so less heat is lost to the surroundings

What is phototropism and which part of a plant is positively phototropic?

What is phototropism and which part of a plant is positively phototropic?

Phototropism is the growth of a plant towards a light source. The shoots are positively phototropic (they grow towards the light source).

What is gravitropism and which part of a plant is positively gravitropic?

What is gravitropism and which part of a plant is positively gravitropic?

Gravitropism is the growth of a plant towards the pull of gravity. The roots are positively gravitropic (they grow down in the same direction as the pull of gravity).

What are gravitropism and phototropism examples of? (Higher/Supplement)

What are gravitropism and phototropism examples of? (Higher/Supplement)

They are examples of chemical control in plants

Explain how auxin controls shoot growth (Higher/Supplement)

Explain how auxin controls shoot growth (Higher/Supplement)

- Auxin is made in the shoot tips of the plant and spreads through the plant
- It is unequally distributed in response to light and/or gravity
- It stimulates cell elongation and the growth of the shoot on the side with most auxin