

## Coordinated response flow diagram

Stimulus → receptor cells → sensory neurone → spinal cord  
 → brain → spinal cord → motor neurone → effector  
 → response

## Reflex arc flow diagram

stimulus → receptor cells → sensory neurone → spinal cord  
 → spinal cord → motor neurone → effector → response

**This does not involve the brain.**

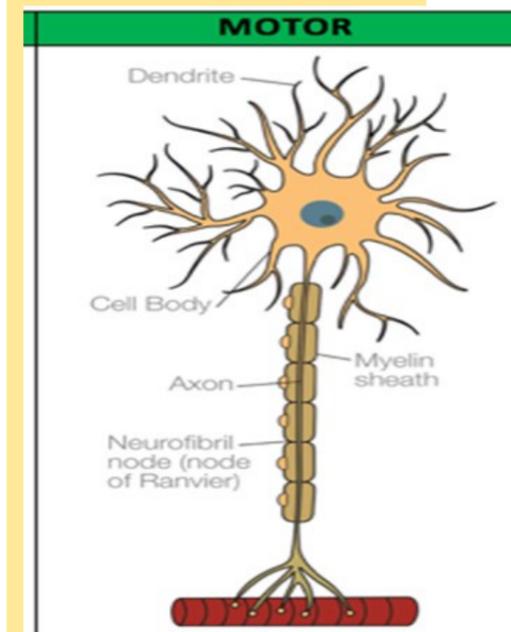
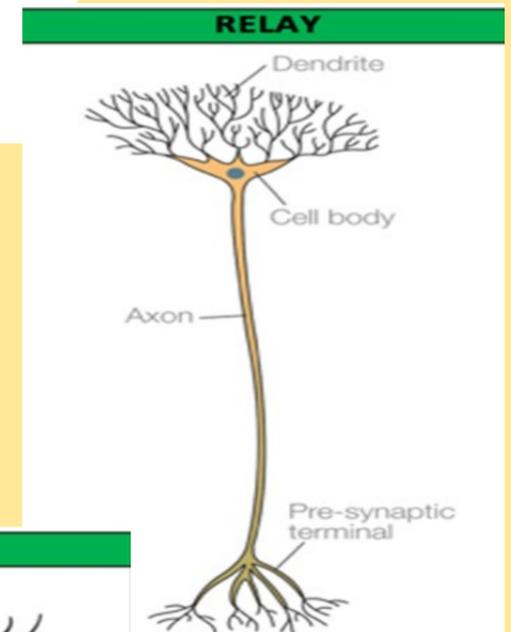
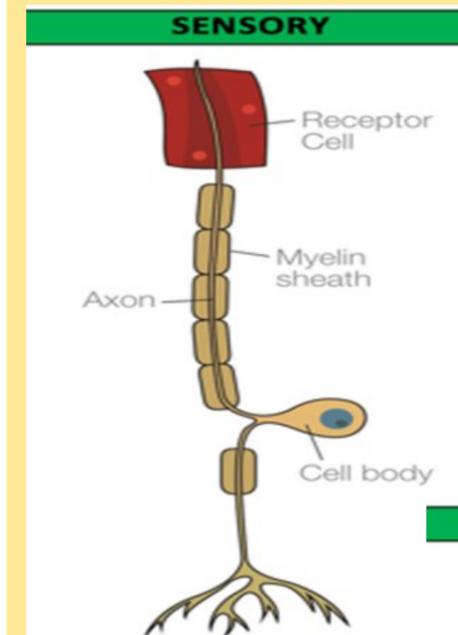
## Stimuli

Sense organ	Sense	Stimulus
Eye	Vision	Light
Tongue	Taste	Chemical
Skin	Touch	Pressure Heat
Nose	Smell Taste	Chemical Chemical
Ear	Hearing	Vibrations

## Definitions

<b>Stimulus</b>	A change in the environment that triggers a response.
<b>Central Nervous System (CNS)</b>	Contains the brain and the spinal cord.
<b>Receptor cells</b>	Found in sense organs, detect stimuli.
<b>Reflex Action</b>	Fast (0.2s), automatic and protective actions that occur without thinking.
<b>Synapse</b>	Space between connecting neurones.
<b>Neurotransmitter</b>	Chemical in the body that triggers an electrical impulse.
<b>Impulse</b>	Signal that travels along a neurone.
<b>Axon</b>	Long fibre.
<b>Myelin Sheath</b>	Fatty insulator that wraps around the axon to speed up impulse transmission.
<b>Dendrite</b>	Branches that receive incoming impulses from other neurones.
<b>Effector</b>	Gland or muscle that carries out a response as a result of a coordinated response or reflex arc.

## Neurones



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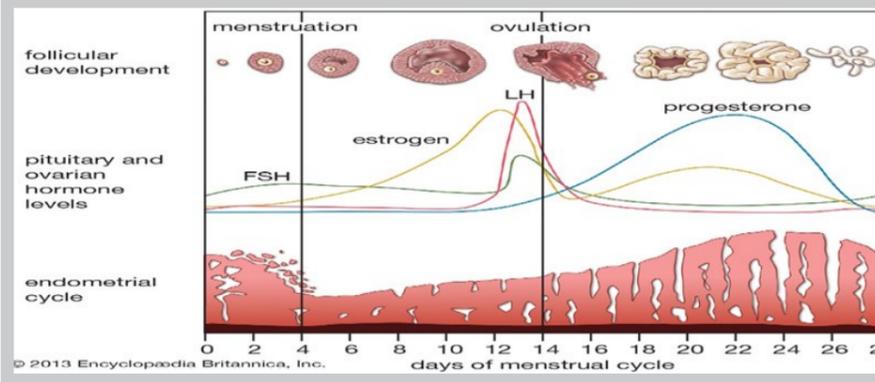
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## Effect of hormones

Hormone	Gland	Effect on body
Adrenaline	Adrenal	"Fight or flight" e.g. pupil dilation, muscle tension.
Thyroxine	Thyroid	Controls metabolism.
Testosterone	Testes	Controls secondary sex characteristics e.g. body hair.
FSH	Pituitary	Causes egg development and stimulates release of oestrogen.
Oestrogen	Ovary	Causes build up of menstrual lining.
LH	Pituitary	Triggers ovulation.
Progesterone	Ovary	Maintains thickness of uterus lining.

## Menstrual cycle hormones

Frogs  
On  
Lily  
Pads

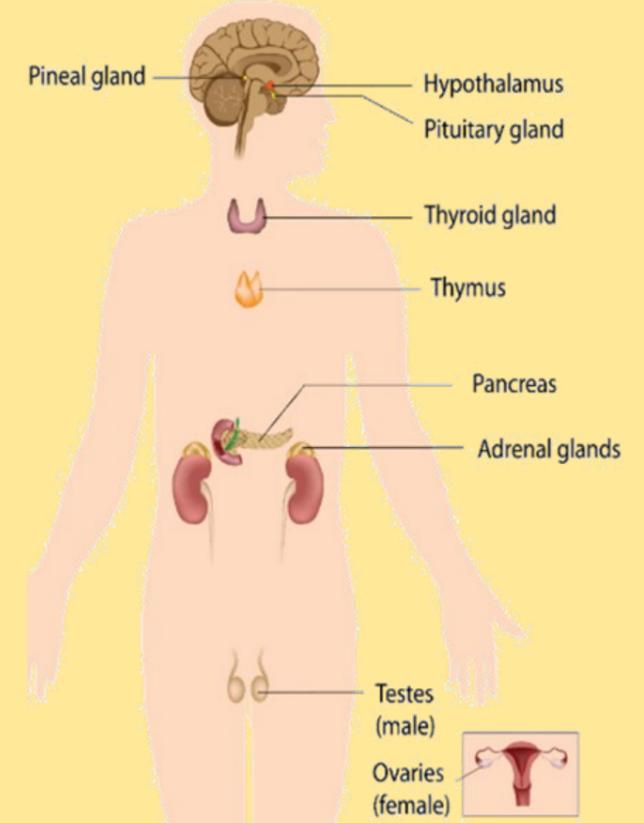


## Definitions

<b>Hormone</b>	Chemical messenger secreted by glands in to the blood.
<b>Gland</b>	Organ in the body that secretes hormones
<b>Endocrine System</b>	Made of glands in the body. Works to control and regulate body processes.
<b>Contraceptive</b>	Used to prevent pregnancy, can be hormonal or barrier.
<b>Ovulation</b>	Release of an ovum (egg) from the ovaries
<b>Menstruation</b>	Shedding of the uterus lining
<b>Infertility</b>	The inability for fertilisation to take place
<b>In vitro fertilisation</b>	Fertilisation that occurs with the help of a doctor outside of the body

## Hormones

### The endocrine system



### Infertility treatment

FSH is given to stimulate egg maturation and LH used to stimulate ovulation.

### Evaluation of IVF:

- Not natural.
- Parents can conceive who normally couldn't.
- IVF is very expensive.
- Enables older parents to have children.

### Contraception

**Hormonal** – affect the menstrual cycle.  
e.g. min pill, combined pill, Hormonal IUD (coil), patch, injection.

☺ Very effective	✗ Don't prevent STI transmission
	✗ Lots of side effects

**Barrier-** prevent sperm and egg fusing by providing a physical barrier.

e.g. male and female condom, diaphragm.

☺ STI prevention	✗ Difficult to use
	✗ Not as effective



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## Diabetes

A condition caused by uncontrolled blood glucose regulation.

Symptoms of diabetes are: thirst, tiredness (fatigue), changes in appetite and can also have effects on vision and wounds healing.

Type	Cause	Treatments	Onset
Type 1	Caused by a breakdown of beta cells in the pancreas that produce insulin. Not enough insulin produced.	Insulin dependent, taken by injection. Can also be supported by lifestyle changes.	From birth
Type 2	Caused by lifestyle, body is not as sensitive to blood glucose.	Lifestyle changes (more exercise and fewer carbohydrates in diet). Some times insulin is needed.	Normally later in life

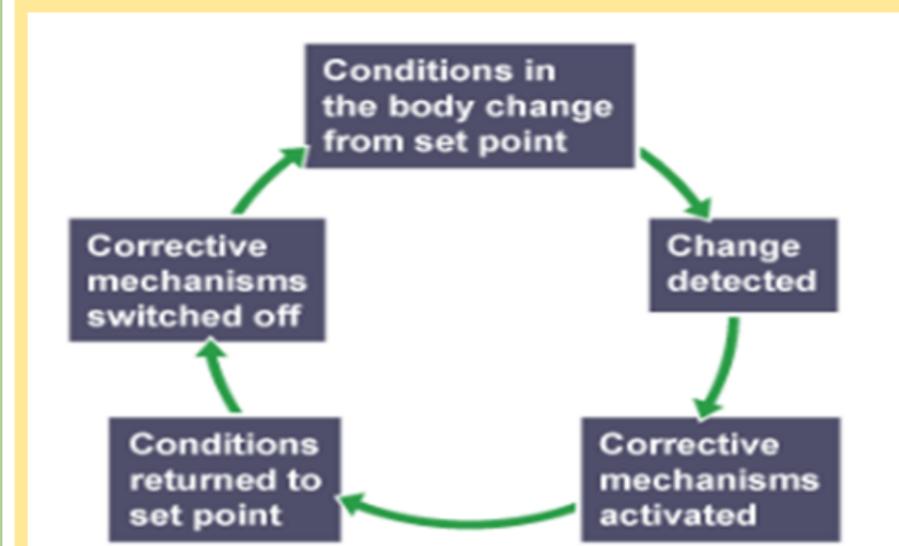
## Definitions

<b>Homeostasis</b>	Regulation of internal environment.
<b>Insulin</b>	Hormone released from pancreas when blood glucose levels are <b>high</b> . Stimulates the liver to convert glucose into glycogen.
<b>Glycogen</b>	Polymer of glucose, used to store glucose.
<b>Glucagon</b>	Hormone released from pancreas when blood glucose levels are <b>low</b> . Stimulates breakdown of glycogen into glucose.

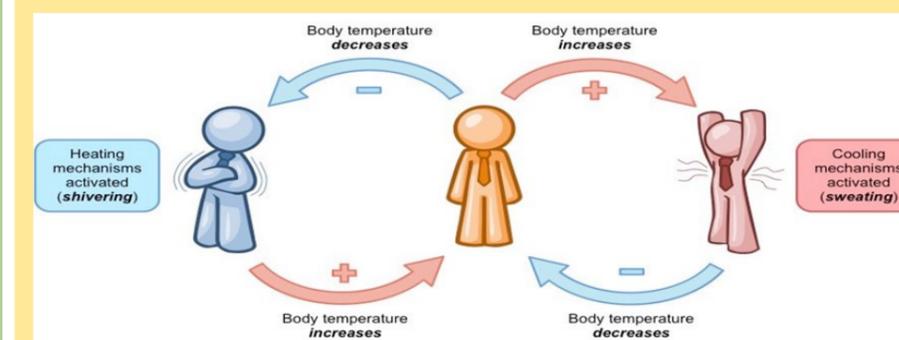
## Negative Feedback

This is a mechanism important in homeostasis. A negative feedback cycle responds when conditions change from the ideal point and returns conditions to this point.

- If the level of something rises, control systems reduce it.
- If the level of something falls, control systems increase it.



e.g. temperature control



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