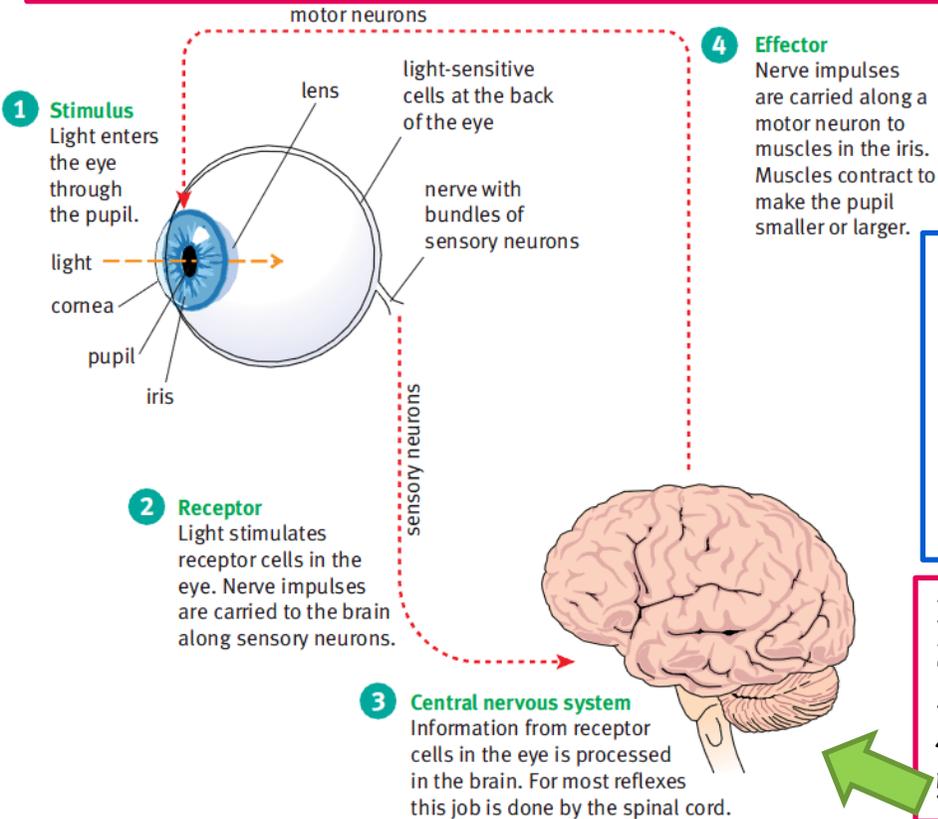
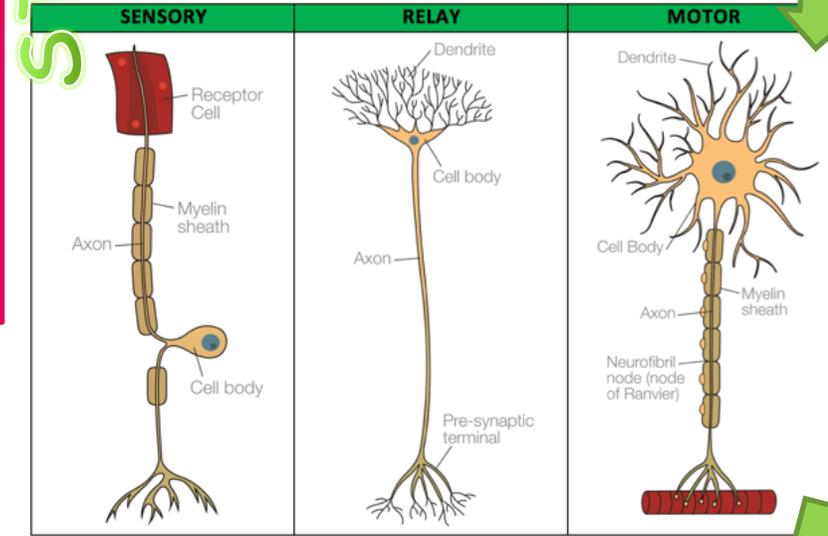


## Key words:

1. **Homeostasis:** Maintaining a constant internal environment
2. **Receptor:** Detects a change in the environment
3. **Effector:** Muscle or gland that carries out a response
4. **Stimulus:** A change in the environment
5. **Sensory neurone:** Carries an electrical impulse from the receptor to the CNS
6. **Relay neurone:** Carries the impulse from the sensory neurone to the motor neurone
7. **Motor neurone:** Carries the impulse from the CNS to the effector
8. **Synapse:** A tiny gap between 2 neurones
9. **Reflex:** An automatic response that does not require processing, helps an organism survive
10. **CNS:** Central Nervous System - the brain and spinal cord
11. **PNS:** Peripheral Nervous System - the neurones that connect the rest of the body to the CNS

## Y11 Homeostasis & Response

**Homeostasis:** Maintaining a constant internal environment e.g. temperature control and blood glucose control.  
**Through both nervous and hormonal control**



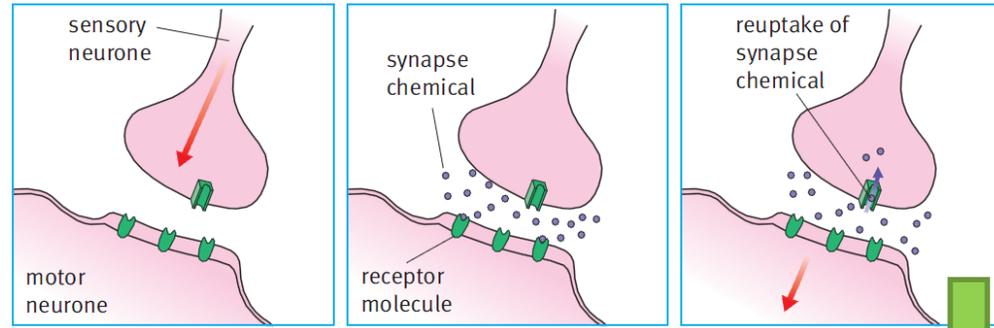
### Motor Neurone V Sensory Neurone

- A motor neurone goes from the CNS to the effector
- A sensory neurone goes from the sensory receptor to the CNS
- A motor neurone has longer axons, sensory neurone has a short axon
- A motor neurone has many short dendrites and a sensory neurone has long runs of (often 1) dendrite
- A motor neurone has its cell body inside the CNS and the sensory neurone has its cell body just outside the CNS

1. Receptor detects a stimulus
2. An impulse is sent along the sensory neurone to the CNS
3. A relay neurone then sends the message to a motor neurone
4. The motor neurone sends the impulse to the effector
5. The effector carries out a response

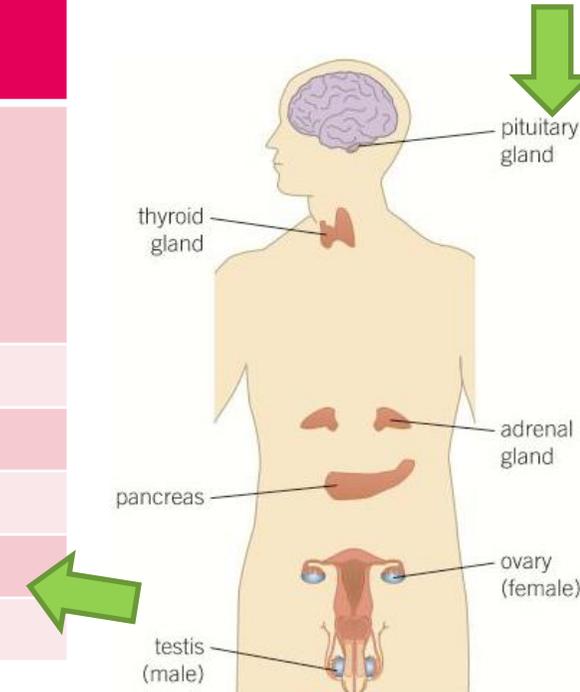
**Key words:**

- Hormones:** Chemical messenger that travels in the blood to target cells and causes a response
- Endocrine gland:** Release hormones
- Contraceptive:** A method to prevent pregnancy
- Ovulation:** When the egg is released
- Menstruation:** A period



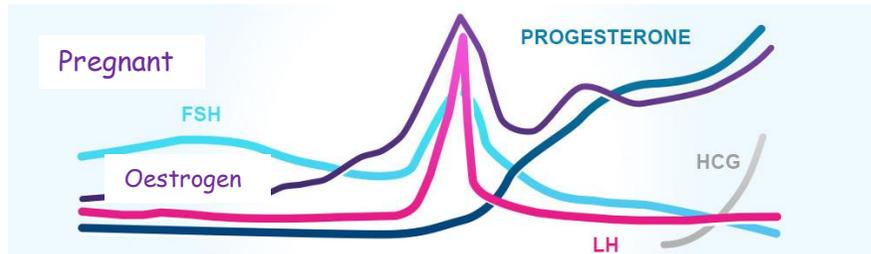
- As the nervous impulse arrives at the **synapse** it causes a **chemical** to be released
- The chemical **diffuses** into the synapse
- The chemical binds to **receptors** on the second neurone, the nervous impulse is passed on

Endocrine gland	Role of the hormones
Pituitary	<ul style="list-style-type: none"> <li>Controls the growth of children</li> <li>Causes the thyroid gland to produce thyroxine</li> <li>Causes the ovaries to produce and release eggs and make oestrogen</li> <li>Causes the testes to make sperm and testosterone</li> </ul>
Thyroid	Controls metabolism
Pancreas	Controls glucose levels
Adrenal	Releases adrenaline
Ovaries	Controls the menstrual cycle
Testes	Controls the development of the male characteristics

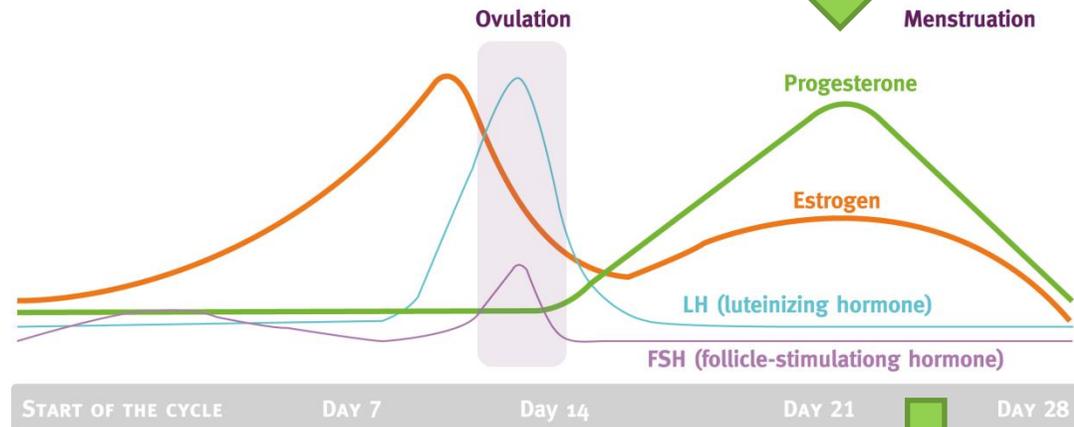


Progesterone and oestrogen rise during pregnancy to maintain and thicken the lining of the womb. HCG is also produced

	Nerve	Hormone
What is it?	Carries an electrical impulse	A chemical messenger
How quick does it carry out a response?	Very quick	Slower than nerves
How long does it last?	Not very long	Longer than nerves
How is it activated?	Through a stimuli being detected by a receptor	Through the CNS sending an impulse along a motor neurone to a gland

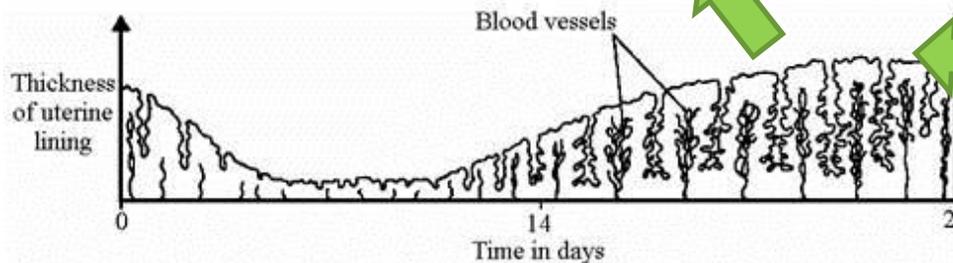


- Hormones have a specific shape
- So affect specific cells



Oestrogen & progesterone causes the lining to get thicker ready for the egg

- 4 Hormones of the menstrual cycle**
1. FSH - Causes the egg to mature
  2. LH - Causes the release of the egg
  3. Oestrogen & Progesterone - Maintain the lining of the womb

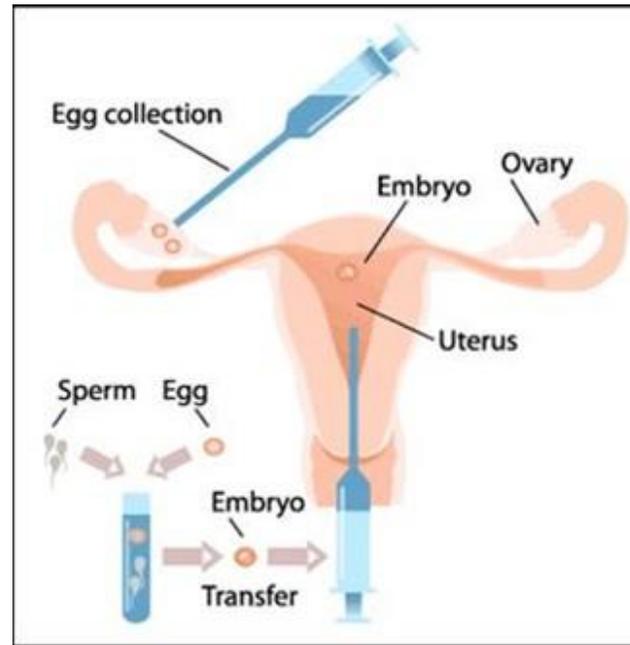


### Lack of ovulation:

- Some women do not ovulate (release an egg)
- Doctors can give them FSH
- It stimulates the eggs in the ovaries to mature and also release oestrogen
- Then the doctor can give LH to cause ovulation (release an egg)
- This can allow some women to get pregnant without IVF

### Non-Hormonal methods of contraception

- Condoms - a physical barrier
- Diaphragm - prevents the sperm getting to the egg
- The coil - intrauterine device which prevents the implantation of an embryo
- Vaginal spermicide - kills sperm
- Abstaining from sexual intercourse
- Male and female sterilisation



### Hormonal methods of contraception

- The pill
- The implant
- The injection
- Intrauterine device that releases a hormone
- Vaginal spermicide

The pill works by stopping FSH production this prevents the egg from maturing, as it contains **progesterone** and **oestrogen**

### Reasons contraception is used:

- when pregnancy might harm the mental or physical condition of the mother
- to limit the number of children people have to ensure they don't damage living standards or affect other children
- to prevent pregnancy in people who do not want a child at this stage in their lives

### IVF:

- Mother is given FSH to stimulate the maturation of a number of eggs followed by LH to cause ovulation
- The eggs and sperm are collected and fertilised outside of the body
- The fertilised eggs are kept in special solutions in a warm environment to develop the embryos
- The embryos are then inserted back into the uterus of the mother

Some people object to contraception because of the following reasons:

- Contraception is unnatural
- Contraception is anti-life
- Contraception is a form of abortion
- Contraception separates sex from reproduction

	Type 1 diabetes	Both types of diabetes	Type 2 diabetes
risk factors	causes not known for sure	people who have a relative with diabetes are more likely to develop the condition	people who are overweight women who have had diabetes during pregnancy people who are Asian or African-Caribbean
age of onset	mainly young people		mainly older people
symptoms	symptoms appear suddenly and are obvious	symptoms include: increased thirst; frequent urination; tiredness; feeling sick; weight loss; blurred vision	symptoms develop slowly and may not be noticed. Symptoms include: increased appetite; tingling in hands and feet; wounds that are slow to heal
cause	cells that make insulin in the pancreas are destroyed		the body no longer responds to its own insulin, or does not make enough insulin
treatment	insulin injections	regular testing of blood sugar levels; healthy diet; exercise	tablets either to increase insulin production or to help the body make better use of the insulin it does produce
prevention	prevention is not yet possible		a better diet, increased physical activity and modest weight loss can greatly cut the risk

**Insulin**  
 Glucose → Glycogen  
**Glucagon**  
 Glycogen → Glucose



- When glucose is higher insulin is released
- This caused glucose to be stored as glycogen
- When blood glucose levels drop too low glucagon is released
- Glucagon converts stored glycogen back into glucose



1. What is homeostasis?
2. Explain the difference between a receptor and an effector
3. Explain the difference between a motor neurone and a sensory neurone
4. Describe a reflex arc
5. Explain what a reflex is and why it is important
6. Explain how an impulse crosses a synapse
7. What is an endocrine gland?
8. What is a hormone?
9. Explain how hormonal control is different to neuronal control
10. Name the 6 endocrine glands and describe what they do
11. Explain the roles of insulin and glucagon in the control of blood glucose
12. What is diabetes?
13. Compare and contrast type 1 and type 2 diabetes
14. homeostasis
15. Describe the roles of the 4 hormones in the menstrual cycle
16. Describe how the 4 hormones change during the menstrual cycle
17. Compare the hormones of the normal menstrual cycle to that of pregnancy
18. Describe the different forms of contraception
19. Explain how the contraceptive pill works to prevent pregnancy
20. Explain how IVF can be used to treat fertility problems
21. Explain how doctors can treat women who are not ovulating