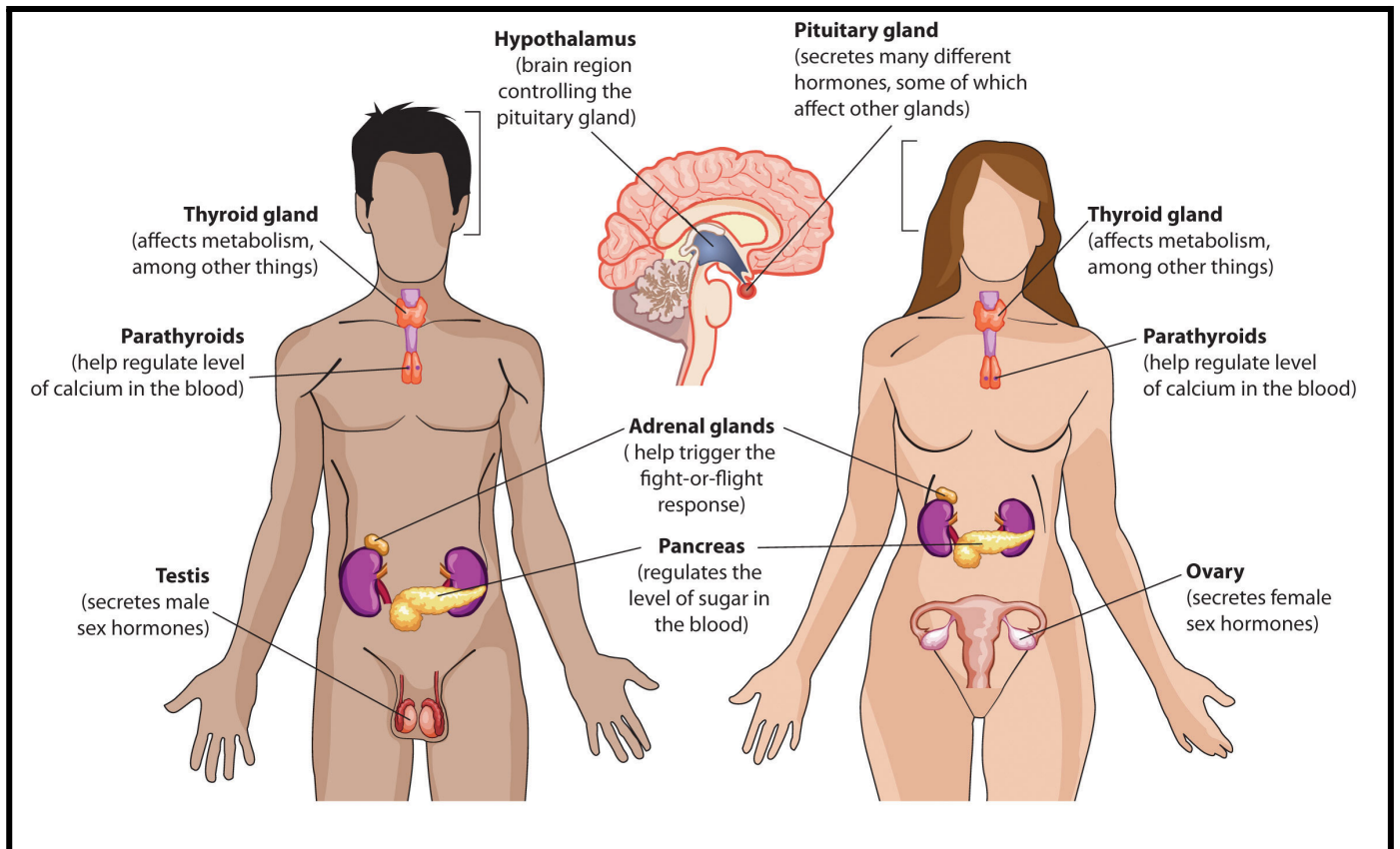


Homeostasis and Response

Name :



Contents.

Section	Content	Page
1	Knowledge organiser	3
2	Retrieval practice question bank.	7
3	Homeostasis and response	10
4	The human nervous system	12
5	Hormonal coordination in humans	20
6	Regulation of blood glucose levels	24
7	Diabetes	28
8	The role of glucagon (HT)	32
9	Hormones in human reproduction	34
10	Contraception	40
11	The use of hormones to treat infertility (HT)	46
12	Thyroxine & Adrenaline (HT)	48

Term	Definition
Adrenal gland	Either of a pair of endocrine glands situated on top of the kidney. The adrenal glands secrete the fight or flight hormone Adrenaline into the bloodstream to help individuals respond to stressful events.
Barrier methods	Mechanical barriers are devices that provide a physical barrier between the sperm and the egg. Examples of mechanical barriers include the male condom, female condom, diaphragm, cervical cap, and sponge. The condom is the only contraceptive method that helps prevent sexually transmitted infections (STIs).
Blood glucose concentration	Glucose is a sugar needed by cells for respiration. It is important that the concentration of glucose in the blood is maintained at a constant level. Insulin, a hormone secreted by the pancreas, controls blood sugar levels in the body. It travels from the pancreas to the liver via the bloodstream.
CNS - central nervous system	The part of the nervous system which in vertebrates consists of the brain and spinal cord, to which sensory impulses are transmitted and from which motor impulses are transmitted to effectors to bring about a response to a change in the environment.
coordination	The detection of changes in the environment through sensory receptors, processing of the sensory input via the CNS and the final response brought about by motor impulses communicating with effectors such as glands or muscles.
Coordination centers	The nervous system is made up of the brain, the spinal cord and nerves. The brain and spinal cord are the central nervous system or CNS
contraception	The deliberate prevention of conception or impregnation by any of various drugs, techniques, or devices also referred to as birth control.
effectors	A muscle which contracts to bring about movement or a gland that secretes hormones or enzymes in response to impulses from motor neurons.
embryo	When a blastocyst implants in the uterus and begins its development it is considered to be an embryo.
Endocrine system	The endocrine system is the organ system responsible for releasing chemical messengers called hormones into the bloodstream. The endocrine system includes the adrenal glands, parathyroid gland, pituitary gland, and thyroid gland, as well as the ovaries, pancreas, and testes.
Endometrium	The glandular lining of the uterus which goes through monthly changes as part of the menstrual cycle in order to facilitate implantation and nourishment of an embryo should a pregnancy occur.
Fertility drugs	Some women have difficulty becoming pregnant because they don't produce enough FSH to allow their eggs to mature. Fertility drugs contain FSH and LH, which stimulate eggs to mature in the ovary. Fertility treatments increase a woman's chance of becoming pregnant, although the treatment may not always work. On the other hand, because the treatment boosts the production of mature eggs, multiple conceptions sometimes occur, with twins or

	triplets being expected. This increases the risk of complications in pregnancy and childbirth, and may lead to premature or underweight babies.
FSH (Follicle Stimulating Hormone)	The hormone FSH is secreted by the pituitary gland. FSH makes two things happen: 1. it causes an egg to mature in an ovary 2. It stimulates follicular cells in the ovaries to secrete the hormone oestrogen, which stimulates the growth of the endometrium.
Gland	An organ in the body that produces and secretes a specific substance, such as a hormone or an enzyme. For example the pancreas is a gland that secretes digestive enzymes into the small intestine, it also secretes the hormones insulin and glucagon directly into the blood to control blood glucose levels.
Glucagon	Glucagon is a hormone that raises the level of glucose in the blood. Glucagon does the opposite of insulin. When blood glucose concentration decreases the pancreas secretes glucagon. The target organs are the liver and muscles. Glucagon stimulates these organs to convert their stored glycogen back into glucose which is then released into the bloodstream. This response is another type of negative feedback mechanism.
Glycogen	A storage carbohydrate made in the liver and muscles in response to stimulation by insulin. The creation of Glycogen is responsible for bringing elevated blood glucose levels back to the set point. Glycogen is used as an energy store by the liver and muscles.
Hormone	A chemical that can either be protein based or steroid based. Hormones are secreted by the glands of the endocrine system. Hormones travel through the blood where they have their effect on their target organ. For example FSH secreted by the pituitary travels throughout the entire blood stream but only exerts an effect on the follicular cells located in the ovaries of a female.
Homeostasis	Homeostasis is the maintenance of a constant internal environment. The nervous and endocrine systems are responsible for this.
Insulin	Insulin is a peptide or protein based hormone that lowers the level of glucose in the blood. It's made in and secreted by the beta cells of the pancreas. The pancreas detects an increase in blood glucose, secreting insulin in response. Insulin acts on its target organs, the liver and muscles which take up glucose (reducing blood glucose) and convert the glucose into a storage carbohydrate called Glycogen.
Internal conditions	Conditions in the body are controlled, to provide a constant internal environment. This is called homeostasis. The conditions that must be controlled include body temperature, water content, carbon dioxide level, and blood glucose levels.
Intrauterine device	intrauterine contraceptive device (IUD) is a device inserted into the uterus to prevent conception (pregnancy). There are two types. A copper one which makes the uterus toxic to sperm or one which releases progesterone which inhibits FSH. This means follicles will not mature preventing ovulation. Both need to be inserted or removed by medical professionals. As with any medical there are risks eg infection.
IVF	In vitro fertilization (IVF) is a procedure in which eggs (ova) from a woman's ovary are removed. They are fertilized with sperm in a laboratory procedure, and then the fertilised egg (embryo) is returned to the woman's uterus.
LH (Luteinising Hormone)	The hormone LH is secreted by the pituitary gland in response to a peak in oestrogen production by the follicular cells in the ovary. LH causes the mature egg to be released from the ovary during ovulation.

Motor neurone	A neuron that transmits impulses from the central nervous system to an effector which would be either a gland which will release a hormone to bring about a response or a muscle which will contract to bring about movement and a response to a change in the environment.
Menstrual cycle	The menstrual cycle in women is a recurring process in which the lining of the uterus - the endometrium - is prepared for pregnancy. If pregnancy does not happen, the lining is shed during menstruation. Several hormones control this cycle, which includes controlling the release of an egg each month from an ovary, and changing the thickness of the uterus lining. These hormones are secreted by the ovaries and pituitary gland.
Negative feedback	Negative feedback ensures that, in any control system, changes are reversed and returned back to the set level. For example, negative feedback keeps our body temperature at a constant 37°C. If we get too hot, blood vessels in our skin vasodilate (become larger) and we lose heat and cool down. If we get too cold blood vessels in our skin vasoconstrict (become smaller), we lose less heat and our body warms up. Negative feedback makes sure this happens. The response to insulin and glucagon to keep blood glucose at its set point is another example of negative feedback.
Obesity	Being clinically overweight or Obesity is defined as a body mass index (BMI) of 30 or more. It is associated with insulin resistance and Type II diabetes. The treatment for type II diabetes is dietary control and weight loss.
Oestrogen	The hormone oestrogen is secreted by the ovaries. Oestrogen makes three things happen: 1. it stops FSH being produced - so that only one egg matures in a cycle 2. it stimulates the pituitary gland to release the hormone LH 3. Stimulates the growth of the endometrium (lining of the uterus)
Oral contraception	Various pills containing estrogen and progesterone, or a progesterone alone, that inhibit ovulation and are used to prevent conception. Also called the birth control pill.
Ovulation	Ovulation is an event within the female menstrual cycle whereby a mature ovarian follicle (part of the ovary) discharges an egg (also known as an ovum or female gamete). It is during this process that the egg travels down the fallopian tube where it may be met by a sperm and become fertilised. Ovulation occurs around day 14 of the cycle following a surge in a hormone called LH released by the pituitary gland.
Ova	The haploid female reproductive cell or gamete, which when fertilised becomes a haploid Zygote which following mitosis will form an embryo. The menstrual cycle controls the maturation, ovulation and subsequent implantation of an ova (if fertilisation occurs).
Ovary	The female gonad or reproductive gland, in which the ova and the hormones that regulate female secondary sex characteristics develop.
Pituitary gland	The main endocrine gland. It is a small structure at the base of the brain. It is called the master gland because it produces hormones that control other glands. The Pituitary is responsible for the release of FSH & LH. It is also responsible for releasing the hormones which stimulate the thyroid to secrete Thyroxine.
Puberty	The period during which the secondary sex characteristics begin to develop and the capability of sexual reproduction is attained.

Reponse	Any behavior of a living organism that results from an external or internal stimulus.
Reflex arc	A reflex arc is a neural pathway consisting of sensory, relay and motor neurons that control reflex actions. In vertebrates, most sensory neurons do not pass directly into the brain, but synapse in the spinal cord.
Reflex actions	When a receptor is stimulated it sends a signal to the central nervous system, where the brain coordinates the response, but sometimes a very quick response is needed, one that does not involve the brain - this is a reflex action. Reflex actions are rapid and happen outside conscious control. For example, you would pull your hand away from a hot flame without thinking about it.
Relay neurone	Relay neurons are unmyelinated neurons that carry impulses within the CNS. The relay neurons located within the spinal cord can bypass the brain, allowing a reflex action to occur much faster and outside of conscious control.
Progesterone	Progesterone is a hormone secreted by a corpus luteum located in the ovaries. It maintains the lining of the uterus during the middle part of the menstrual cycle and during pregnancy. Progesterone also inhibits FSH release from the pituitary which prevents the maturation of further follicles should pregnancy occur. Progesterone is a major component of the oral contraceptive and contraceptive implants.
Receptors	A specialised cells or nerve endings which synapse with sensory neurons. They allow the perception of changes in the external or internal environment. For example rods and cones are receptor cells located in the eye that allow the perception of light. Beta cells in the pancreas have receptors which monitor blood glucose concentration and release Insulin in response to increasing blood glucose concentration.
Secondary sexual characteristics	Secondary sex characteristics are features that appear during puberty in humans. Oestrogen and progesterone are responsible for the development of secondary sex characteristics in females eg growth of breasts, wider hips and body hair. Testosterone is the hormone associated with secondary sex characteristics in males such as the development of larger penis size, deeper voice and body hair.
Sensory neurone	Sensory neurons have receptors or synapse with receptors. They are responsible for carrying impulses from receptors which detect changes in the internal or external environment and carry these impulses to the CNS which coordinates a response.
spermicide	Spermicide is a contraceptive substance that destroys sperm, inserted vaginally prior to intercourse to prevent pregnancy. Usually, spermicides are combined with contraceptive barrier methods such as diaphragms, condoms, cervical caps, and sponges.
sterilisation	Sterilisation (called vasectomy for men and tubal ligation for women) is a permanent method of contraception. Vasectomy prevents sperm from being released into the ejaculate. Tubal ligation prevents an ova from being able to travel down the fallopian tube making fertilisation impossible.
stimuli	Something that can elicit or evoke a physiological response in a cell, a tissue, or an organism. A stimulus can be internal or external. Sense organs, such as the ear, and sensory receptors, such as those in the skin, are sensitive to external stimuli such as sound and touch.
Synapse	This is a very small gap between two adjacent neurons. When an electrical impulse arrives at a synapse, chemicals called neurotransmitters are released into the synapse. These neurotransmitters diffuse across the synapse, allowing the impulse to be initiated in the adjacent neuron.

Testes	The testes produce and store sperm and are also the body's main source of male hormones, such as testosterone. These hormones control the development of the reproductive organs and other male characteristics, such as body and facial hair, low voice, and wide shoulders.
Testosterone	A sex hormone produced by the testes that encourages the development of male sexual characteristics in males.
Thyroid gland	A butterfly-shaped endocrine gland in the neck that is found on both sides of the trachea. It secretes the hormone thyroxine which controls the rate of metabolism.
Thyroxine	A hormone secreted by the thyroid gland. Thyroxine controls the metabolic rate. Underactive thyroid glands are associated with a low metabolic rate and subsequent weight gain.
Type1 diabetes	Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin, a hormone needed to allow sugar (glucose) to enter cells to produce energy. Type 1 diabetes needs to be treated with insulin injections before or after mealtimes.
Type 2 diabetes	Type 2 diabetes develops when the insulin-producing cells in the body are unable to produce enough insulin, or when the insulin that is produced does not work properly (known as insulin resistance). Type 2 diabetes is strongly associated with obesity and needs to be treated through strict diet control.
uterus	The muscular reproductive organ in females in which following implantation, an embryo is nourished and protected as it grows into a foetus. The menstrual cycle is concerned with the maturation of an immature egg, ovulation and the growth of the endometrium to support implantation should pregnancy occur.

Homeostasis Retrieval Practice.

1. What is homeostasis?
2. Give examples of conditions in the internal environment that need to be regulated and maintained.
3. What is negative feedback?
4. What is a stimulus?

Nervous system.

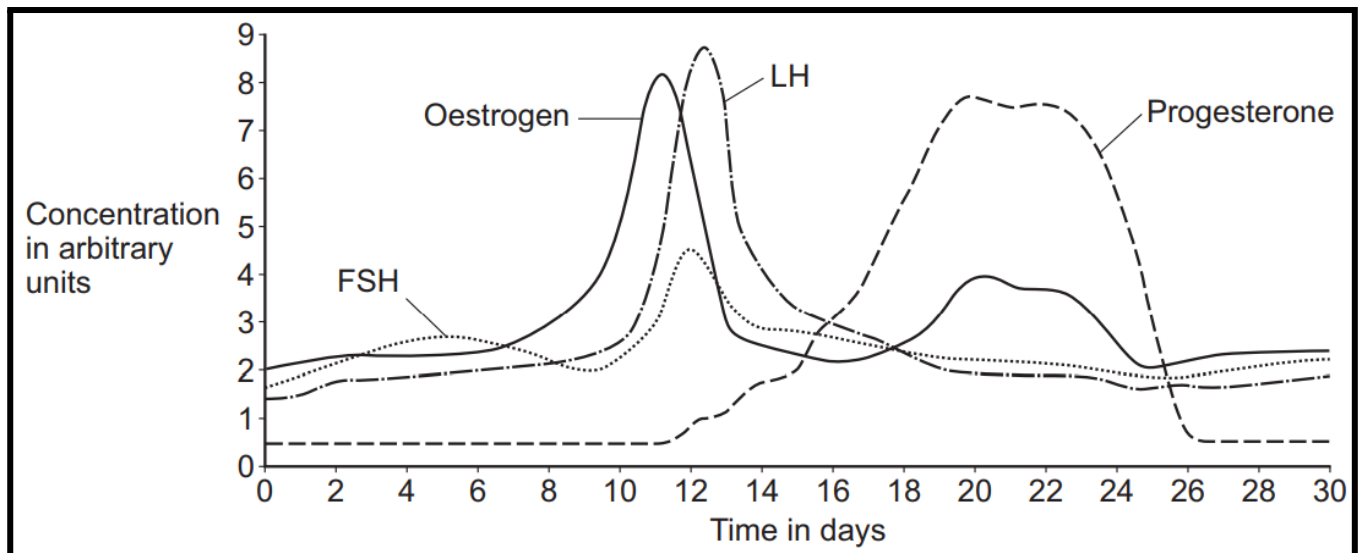
5. What is the CNS comprised of?
6. Explain the role of a sensory neurone.
7. Explain the role of a relay neurone.
8. Explain the role of a motor neurone.
9. What is an effector?
10. Which type of effector secretes hormones?
11. What is a synapse?
12. What is a reflex?
13. Explain the sequence of events that comprise a reflex arc?
14. How do reflex arcs protect us?

The Endocrine system

26. What are hormones and what type of organ is responsible for their secretion?
27. Which hormones are secreted by the pituitary?
28. What hormones are secreted by the pancreas and why?
29. What is the exocrine function of the pancreas?
30. Which hormones are secreted by the thyroid and why?
31. Which hormones are secreted by the ovaries and why?
32. Which hormones are secreted by the testes and why?

Control of Blood glucose

32. What effect does insulin have on body cells?
33. What effect does glucagon have on body cells? (HT Only)
34. What is type 1 diabetes and how is it treated?
35. What is type 2 diabetes and how is it treated?



Menstrual Cycle.

1. Where are LH and FSH secreted from?
2. What does FSH do?
3. What does LH do?
4. Where does oestrogen secretion come from?
5. What does Oestrogen do?
6. How can oestrogen and progesterone be used for contraception?

Section 1.

Homeostasis and response

- Students should be able to explain that homeostasis is the regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes.
- Homeostasis maintains optimal conditions for enzyme action and all cell functions.
- In the human body, these include control of:
 1. blood glucose concentration
 2. body temperature
 3. water levels.
- These automatic control systems may involve nervous responses or chemical responses.
- All control systems include:
 1. cells called receptors, which detect stimuli (changes in the environment)
 2. coordination centres (such as the brain, spinal cord and pancreas) that receive and process information from receptors, effectors, muscles or glands, which bring about responses which restore optimum levels.

Key Questions.

1. What is Homeostasis?
2. Why does the body's blood glucose concentration need to stay at a set point?
3. Why does the body need to control its internal temperature?
4. Why does the body control its water levels?

- [illegible]

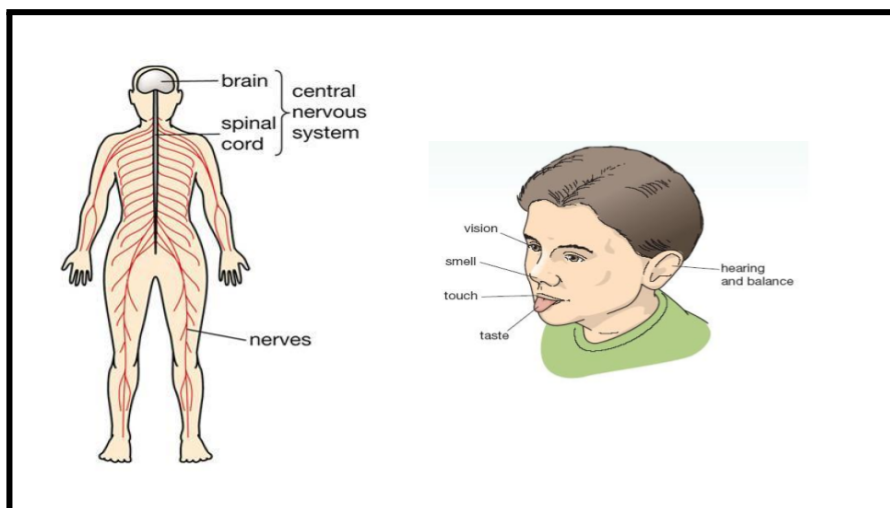
Section 2.

The human nervous system

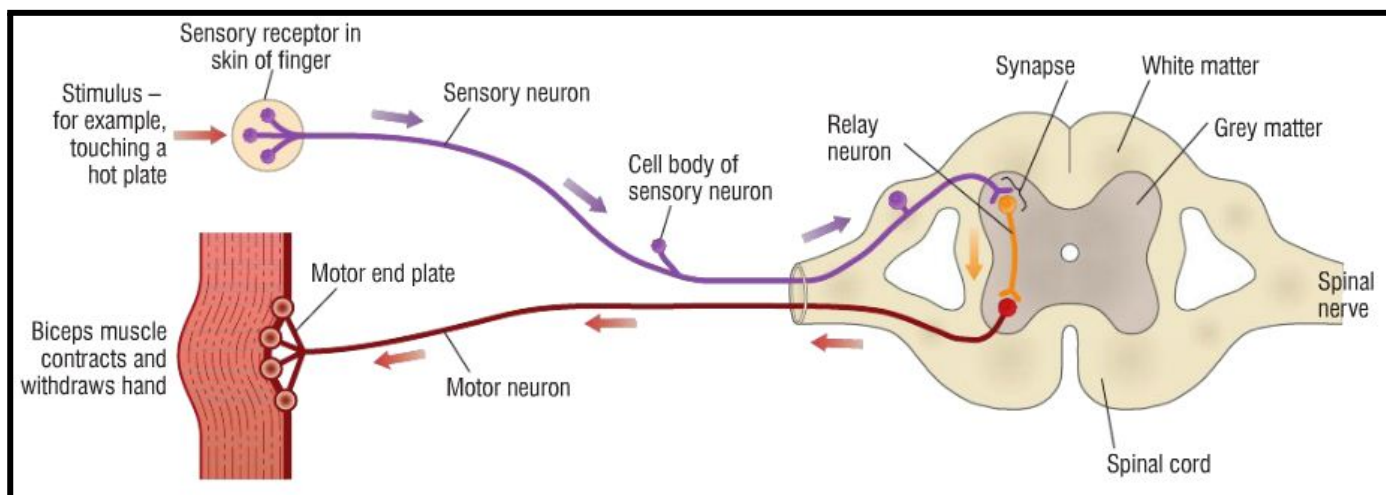
- Students should be able to explain how the structure of the nervous system is adapted to its functions.
- The nervous system enables humans to react to their surroundings and to coordinate their behaviour.
- Information from receptors passes along cells (neurones) as electrical impulses to the central nervous system (CNS). The CNS is the brain and spinal cord. The CNS coordinates the response of effectors which may be muscles contracting or glands secreting hormones.
- stimulus → receptor → coordinator → effector → response
- Students should be able to explain how the various structures in a reflex arc – including the sensory neurone, synapse relay neurone and motor neurone – relate to their function.
- Students should understand why reflex actions are important.
- Reflex actions are automatic and rapid; they do not involve the conscious part of the brain.

Students should be able to extract and interpret data from graphs, charts and tables, about the functioning of the nervous system.

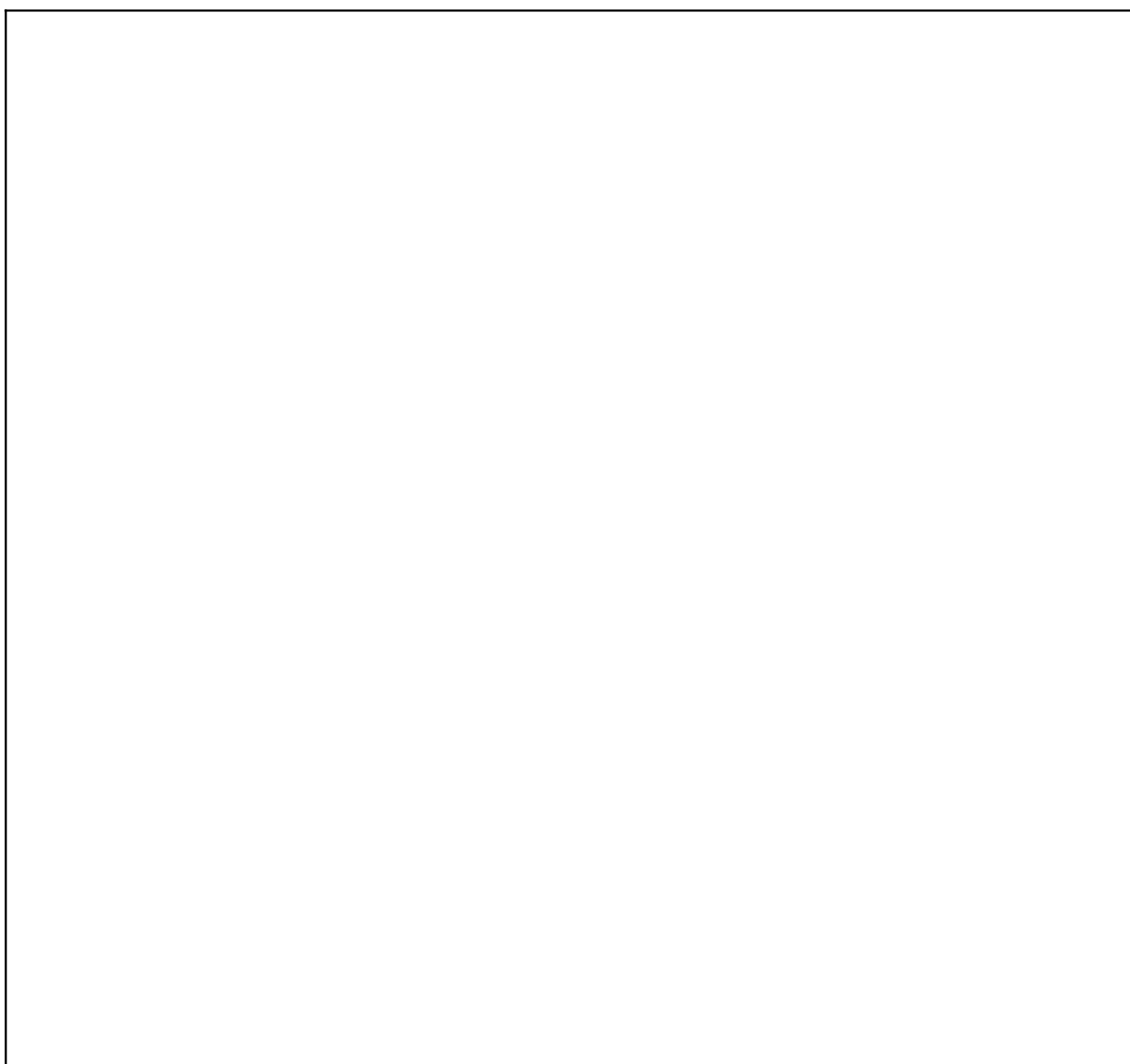
Students should be able to translate information about reaction times between numerical and graphical forms.

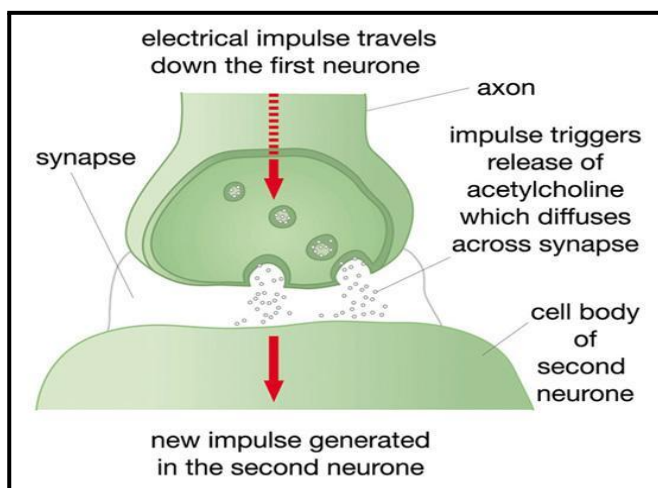


1. How is the nervous system organised?



6. Draw a flow diagram to represent the sequence of a reflex action.





7. Why are reflex actions automatic and rapid?
8. What is a synapse?
9. How are impulses transmitted across a synapse?

[illegible]

Required Practical.

AO2 & AO3 Practice

Q1. Two students investigated reflex action times.

This is the method used.

- 1. Student A sits with his elbow resting on the edge of a table.**
- 2. Student B holds a ruler with the bottom of the ruler level with the thumb of Student A.**
- 3. Student B drops the ruler.**
- 4. Student A catches the ruler and records the distance.**
- 5. Steps 1 to 4 are then repeated.**

The same method was also used with Student A dropping the ruler and Student B catching the ruler.

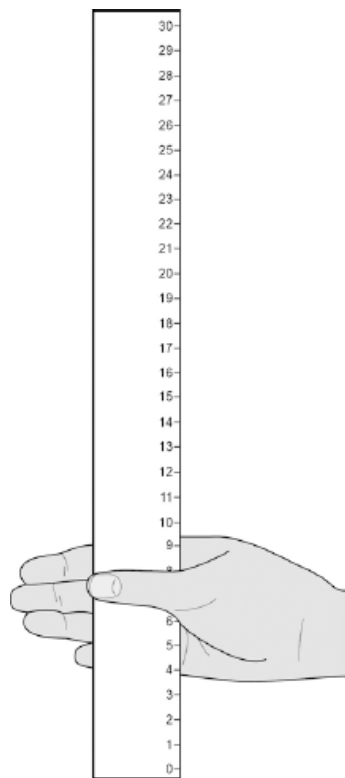
(a) Give two variables the students controlled in their investigation.

1.
2.

(2)

(b) Figure 1 shows one of the results for the Student A.

Figure 1



What is the reading shown in Figure 1?

(c) Table 1 shows the students’ results.

Table 1

Test number	Distance ruler dropped in cm	
	Student A	Student B
1	9	12
2	2	13
3	6	13
4	7	9
5	7	8
Mean	7	X

Circle the anomalous result in Table 1 for Student A.

(1)

(d) What is the median result for Student B?

Tick one box.

8

☐

11

☐

12

☐

13

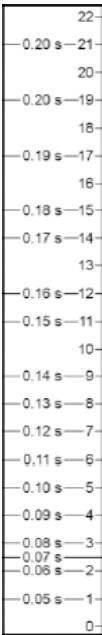
☐

(e) Calculate the value of X in Table 1.

(1)

(f) Figure 2 shows the scale used to convert distance of the ruler drop to reaction time.

Figure 2



Calculate how much faster the reaction time of Student A was compared to Student B.

Use Figure 2 and Table 1.

(2)

(g) What improvement could the students make to the method so the results are more valid?

Tick one box.

Use alternate hands when catching the ruler

☐

Carry out more repeats

☐

Use a longer ruler for catching

☐

Use more than two students to collect results

☐

(h) Student A carried out a second investigation to see the effect of caffeine on the reflex action.

Table 2 shows his results.

Table 2

Test number	Distance ruler dropped in cm	
	Without caffeine	With caffeine
1	9	5
2	6	5
3	9	4
4	6	7
5	10	4
Mean	8	5

Give one conclusion about the effect of caffeine on reflex actions.

(1)
(Total 10 marks)

Section 3

Hormonal coordination in humans

- Students should be able to describe the principles of hormonal coordination and control by the human endocrine system.
- The endocrine system is composed of glands which secrete chemicals called hormones directly into the bloodstream. The blood carries the hormone to a target organ where it produces an effect. Compared to the nervous system the effects are slower but act for longer.
- The pituitary gland in the brain is a 'master gland' which secretes several hormones into the blood in response to body conditions. These hormones in turn act on other glands to stimulate other hormones to be released to bring about effects.

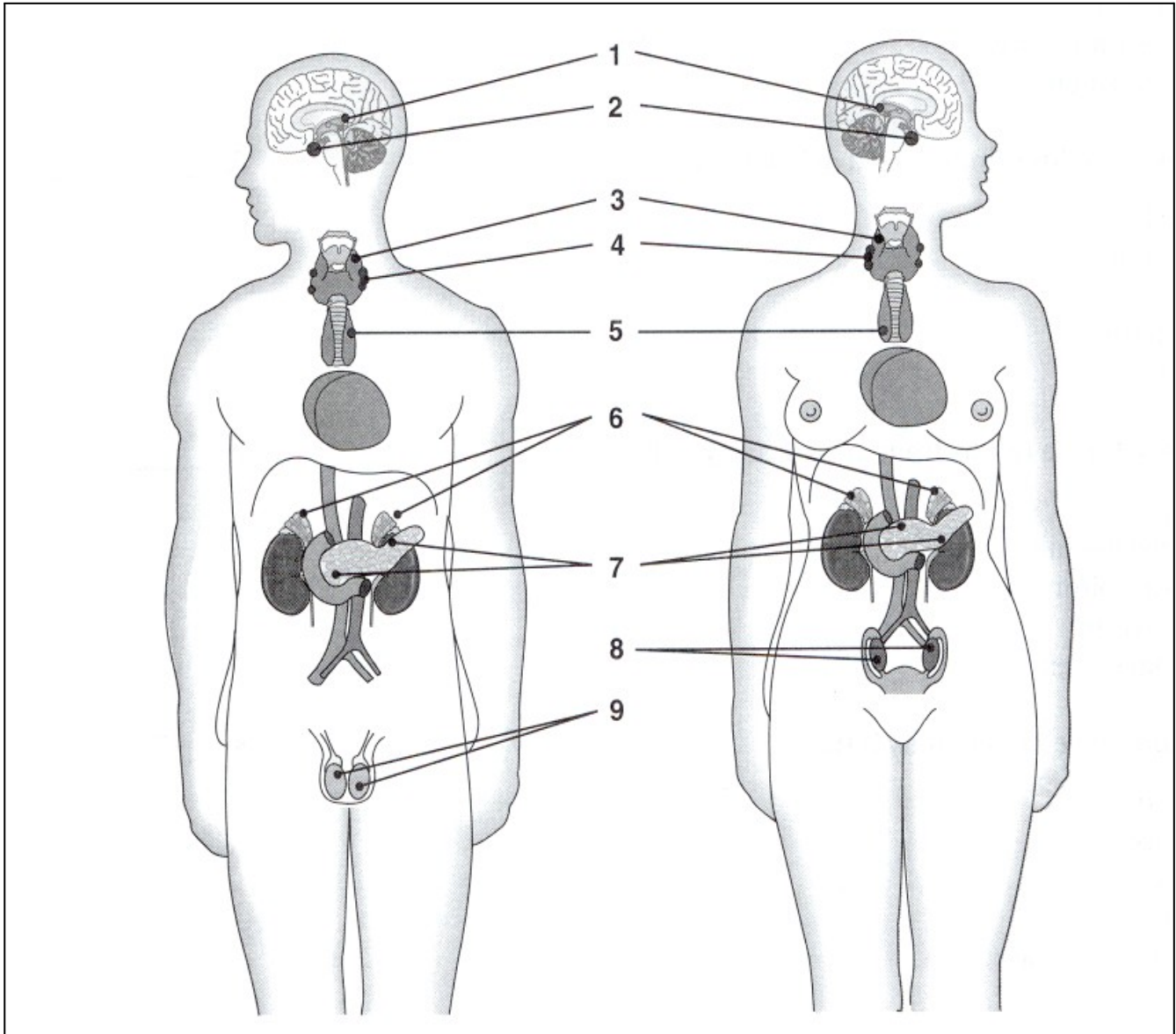
Students should be able to identify the position of the following on a diagram of the human body:

- Pituitary gland
- Pancreas
- Thyroid
- Adrenal gland
- Ovary
- Testes.

Key Questions.

1. What is the endocrine system comprised of?
2. What is the role of the human endocrine system?
3. How are hormones transported from the glands that secrete them to their target organ?
4. What are the roles of the pituitary gland?
5. Name two hormones secreted by the pituitary gland.

6. Identify the position of the following endocrine glands.



Number	Gland
1	
2	
3	
4	
5	
6	
7	
8	
9	

7. Comparing and contrasting the nervous & endocrine system

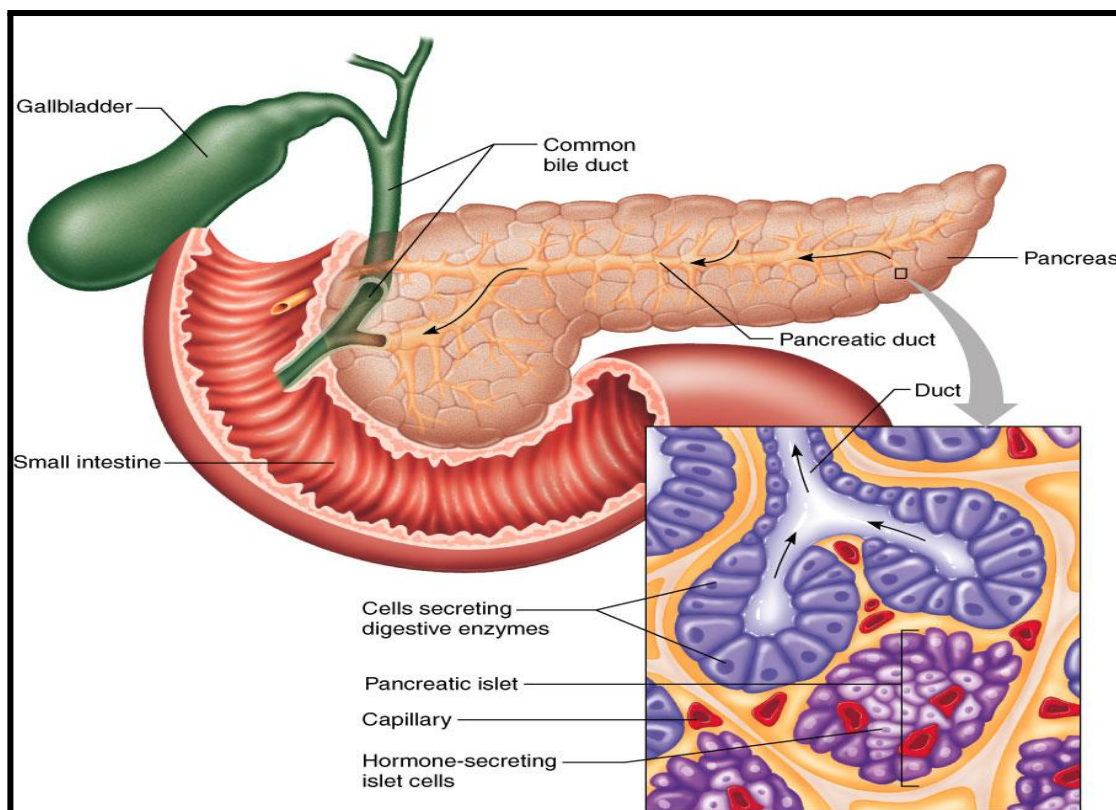
	Nervous system	Endocrine system
How information is carried		
Transmission speed		
Response to signal		
Length of response		
Local or systemic		
Reversible / Irreversible		

Topic 4

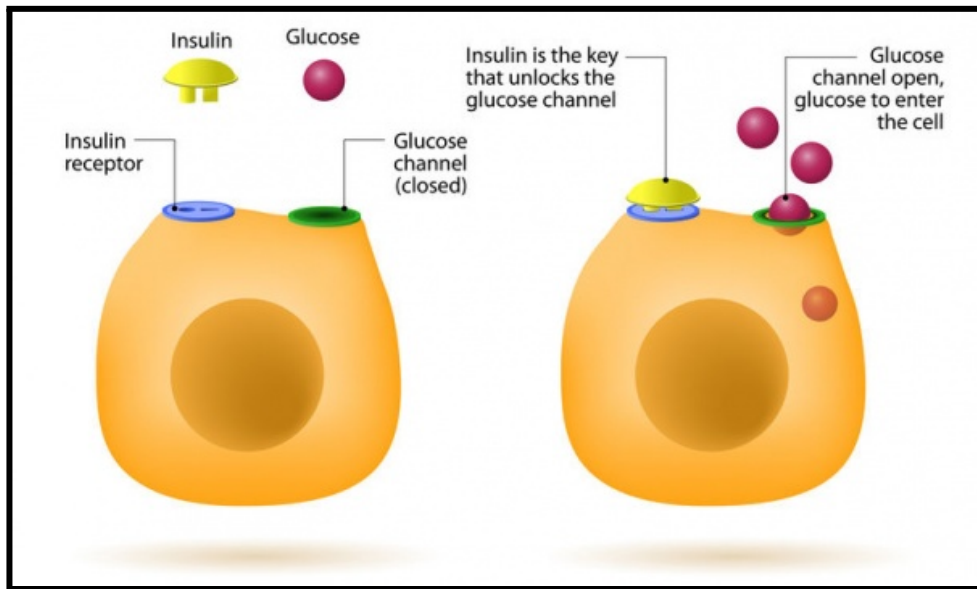
Regulation of blood glucose levels.

- Blood glucose concentration is monitored and controlled by the pancreas.
- If the blood glucose concentration is too high, the pancreas produces the hormone insulin that causes glucose to move from the blood into the cells. In liver and muscle cells excess glucose is converted to glycogen for storage.
- Students should be able to explain how insulin controls blood glucose (sugar) levels in the body.

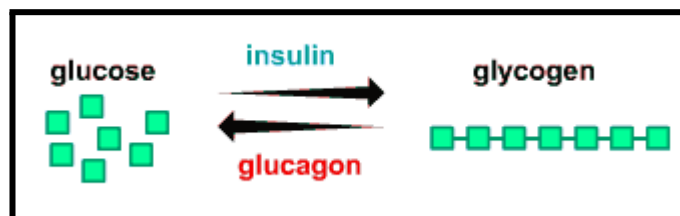
Key Questions.



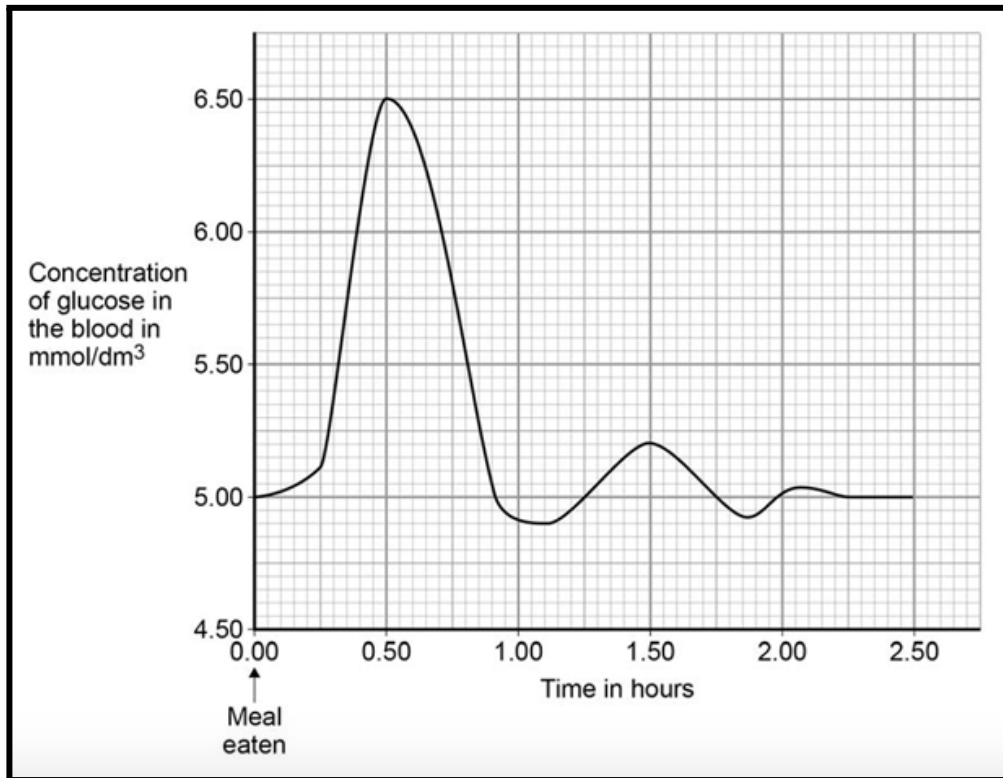
1. Which organ monitors and controls blood glucose concentration?



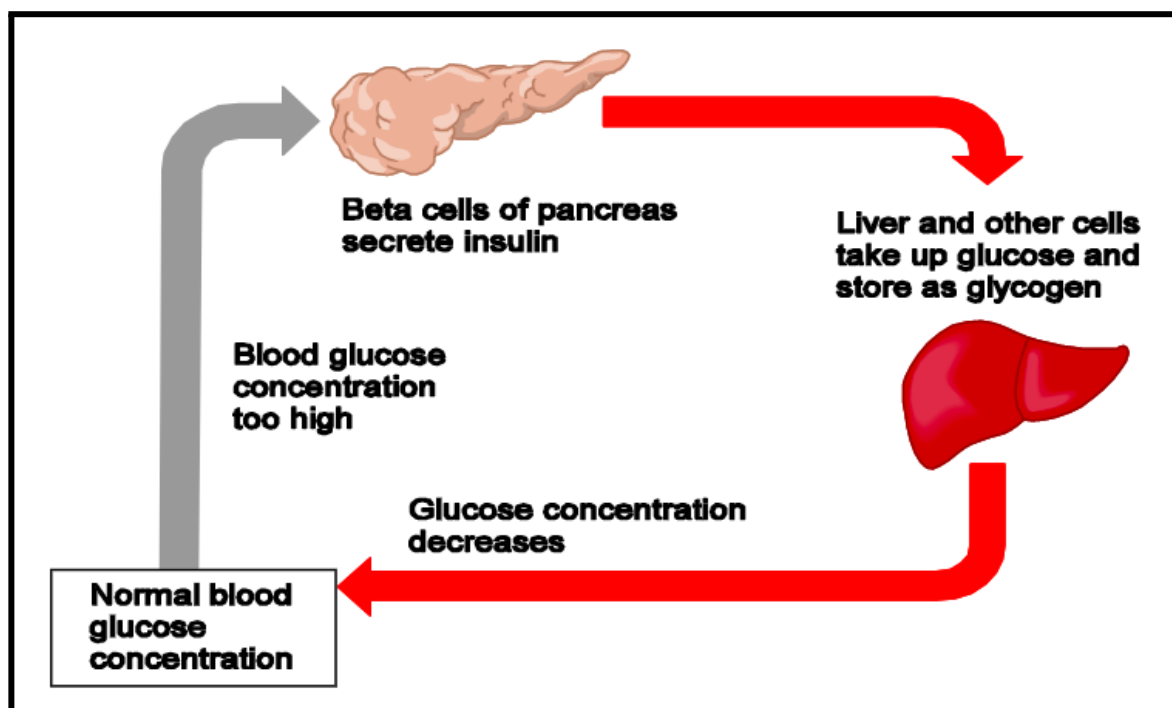
2. What kind of substance is Insulin and what effect does it have on cells?
3. Which cells are targeted by insulin?



4. What is glycogen?



4. The graph shows a person's blood glucose concentration over time. Explain why they show a surge in blood glucose during the first half an hour.



Topic 5 - Lack of control of blood glucose.

Diabetes

- Type 1 diabetes is a disorder in which the pancreas fails to produce sufficient insulin. It is characterised by uncontrolled high blood glucose levels and is normally treated with insulin injections.
- In Type 2 diabetes the body cells no longer respond to insulin produced by the pancreas. A carbohydrate controlled diet and an exercise regime are common treatments. Obesity is a risk factor for Type 2 diabetes.
- Students should be able to compare Type 1 and Type 2 diabetes and explain how they can be treated.
- Students should be able to extract information and interpret data from graphs that show the effect of insulin in blood glucose levels in both people with diabetes and people without diabetes.



Key questions.

1. What effect does insulin have on glucose in the blood?
2. Explain what the cause of type 1 diabetes is and how it should be treated.

RISK FACTORS FOR TYPE 2 DIABETES

			
Have a family history of diabetes	Have a BMI ≥ 23.0 kg/m ²	Lead an inactive lifestyle	Have high blood pressure
			
Have abnormal blood cholesterol/lipid levels	Have a history of gestational diabetes	Are ≥ 40 years old	Have impaired glucose tolerance or impaired fasting glucose

- [illegible]

5. It is important that the concentration of glucose (sugar) in the blood is controlled.

(a) (i) Which hormone controls the concentration of glucose in the blood?

(1)

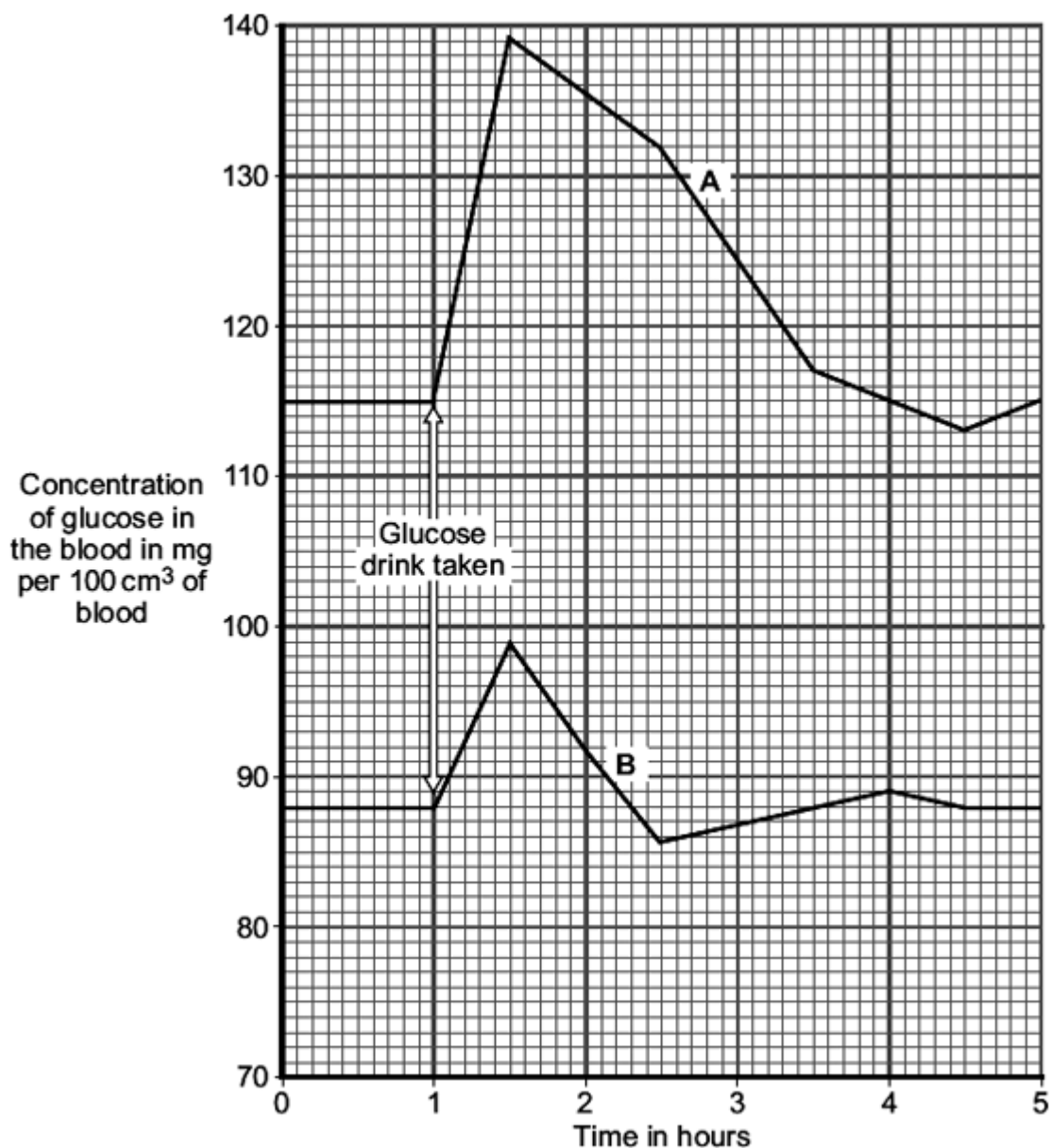
(ii) Which organ produces this hormone?

(1)

(b) The concentration of glucose in the blood of two people, A and B, was measured every half an hour.

One hour after the start, both people drank a solution containing 50 g of glucose.

The graph shows the result.



(i) By how much did the blood glucose concentration in person B rise after drinking the glucose drink?

_____ mg per 100 cm³ of blood

(1)

(ii) A doctor suggests that person A has diabetes.

Give two pieces of evidence from the graph to support this suggestion.

1.
2.

(2)

(iii) Give one reason for the fall in blood glucose concentration in person B, shown in the graph.

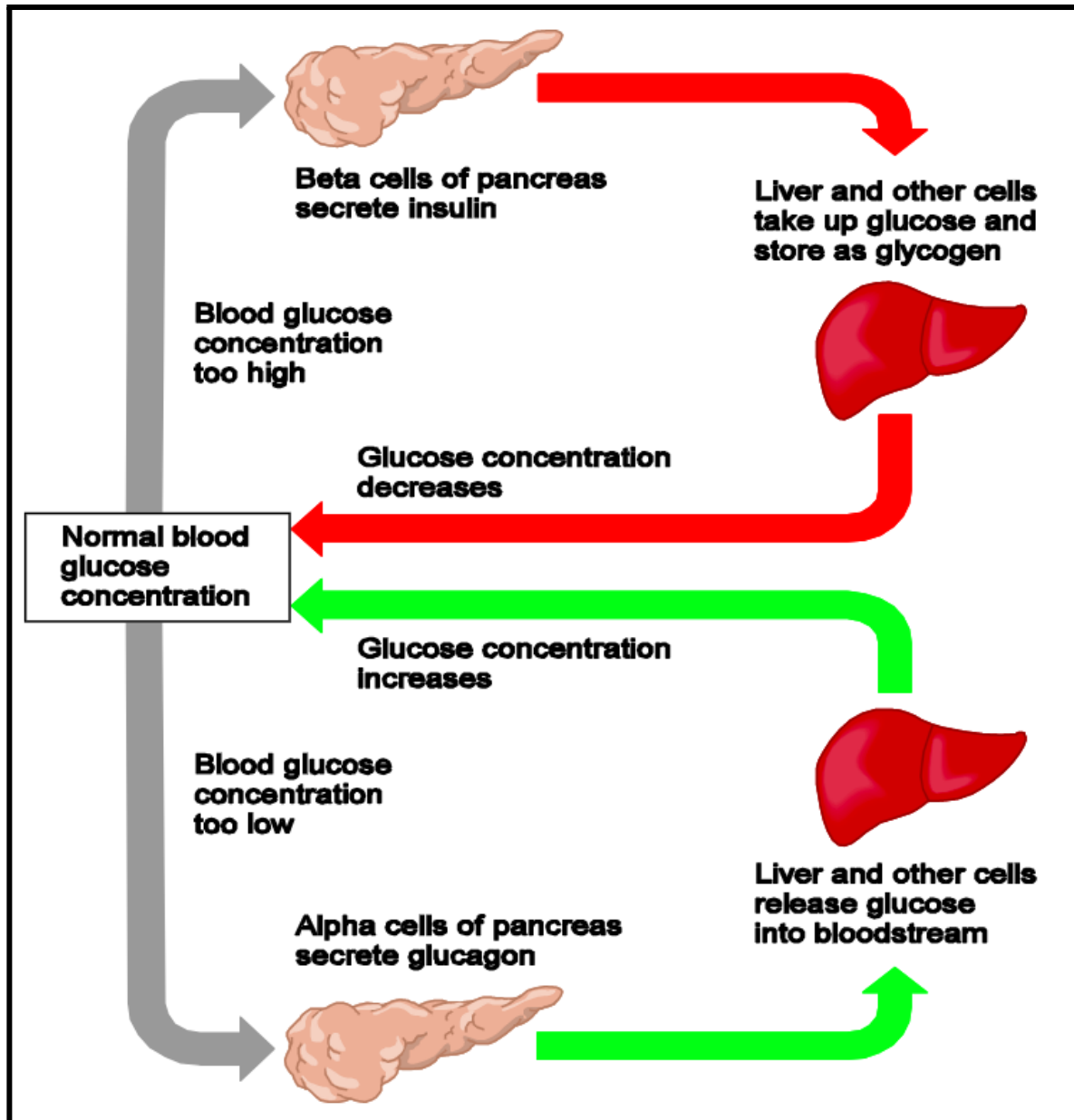
--

(1)

(Total 6 marks)

The role of Glucagon

- (HT only) If the blood glucose concentration is too low, the pancreas produces the hormone glucagon that causes glycogen to be converted into glucose and released into the blood.
- (HT only) Students should be able to explain how glucagon interacts with insulin in a negative feedback cycle to control blood glucose (sugar) levels in the body.



Key Questions.

1. What hormone is released by the pancreas if blood glucose levels become too low?
2. What are the effects of the secretion of glucagon?
3. What is negative feedback and why is the secretion and action of glucagon an example of negative feedback?

Hormones in human reproduction

- Students should be able to describe the roles of hormones in human reproduction, including the menstrual cycle.
- During puberty reproductive hormones cause secondary sex characteristics to develop.
- Oestrogen is the main female reproductive hormone produced in the ovary. At puberty eggs begin to mature and one is released approximately every 28 days. This is called ovulation.
- Testosterone is the main male reproductive hormone produced by the testes and it stimulates sperm production.

Several hormones are involved in the menstrual cycle of a woman.

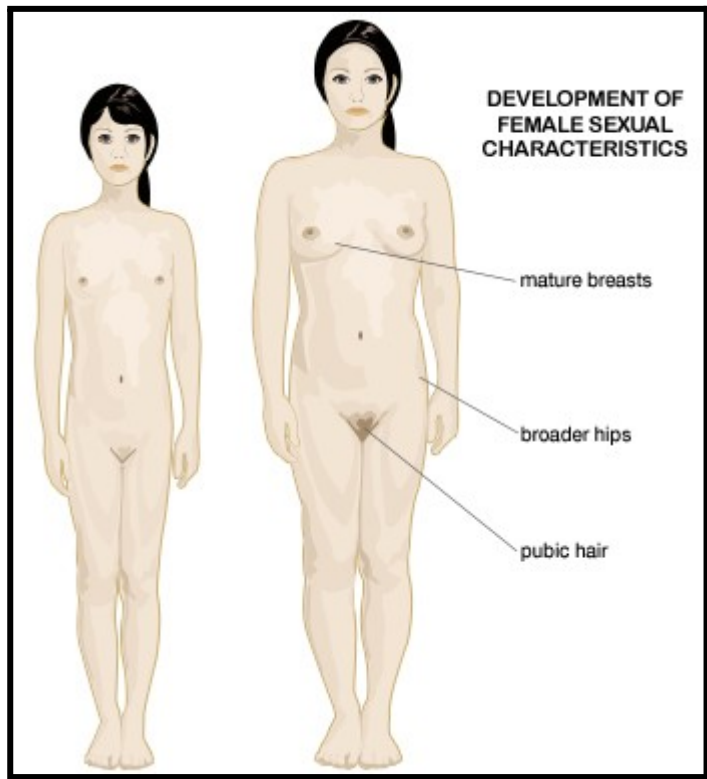
1. Follicle stimulating hormone (FSH) causes maturation of an egg in the ovary.
 2. Luteinising hormone (LH) stimulates the release of the egg.
 3. Oestrogen and progesterone are involved in maintaining the uterus lining.
- (HT only) Students should be able to explain the interactions of FSH, oestrogen, LH and progesterone, in the control of the menstrual cycle.
 - (HT only) Students should be able to extract and interpret data from graphs showing hormone levels during the menstrual cycle.

Key questions - Sex hormones.

1. Complete the table.

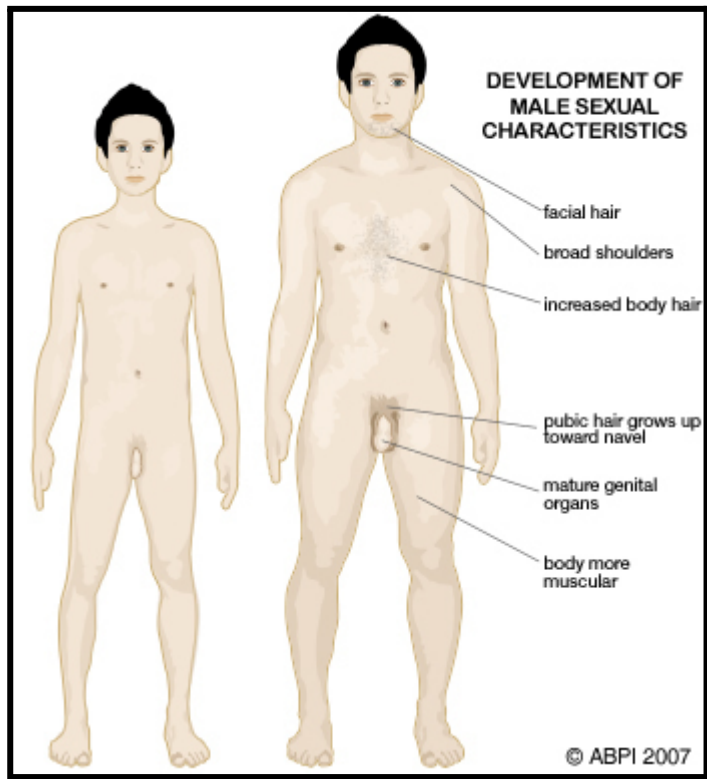
Hormone	Male / Female	Function
FSH		
LH		
Oestrogen		
Progesterone		
Testosterone		

Development of secondary sex characteristics in females.



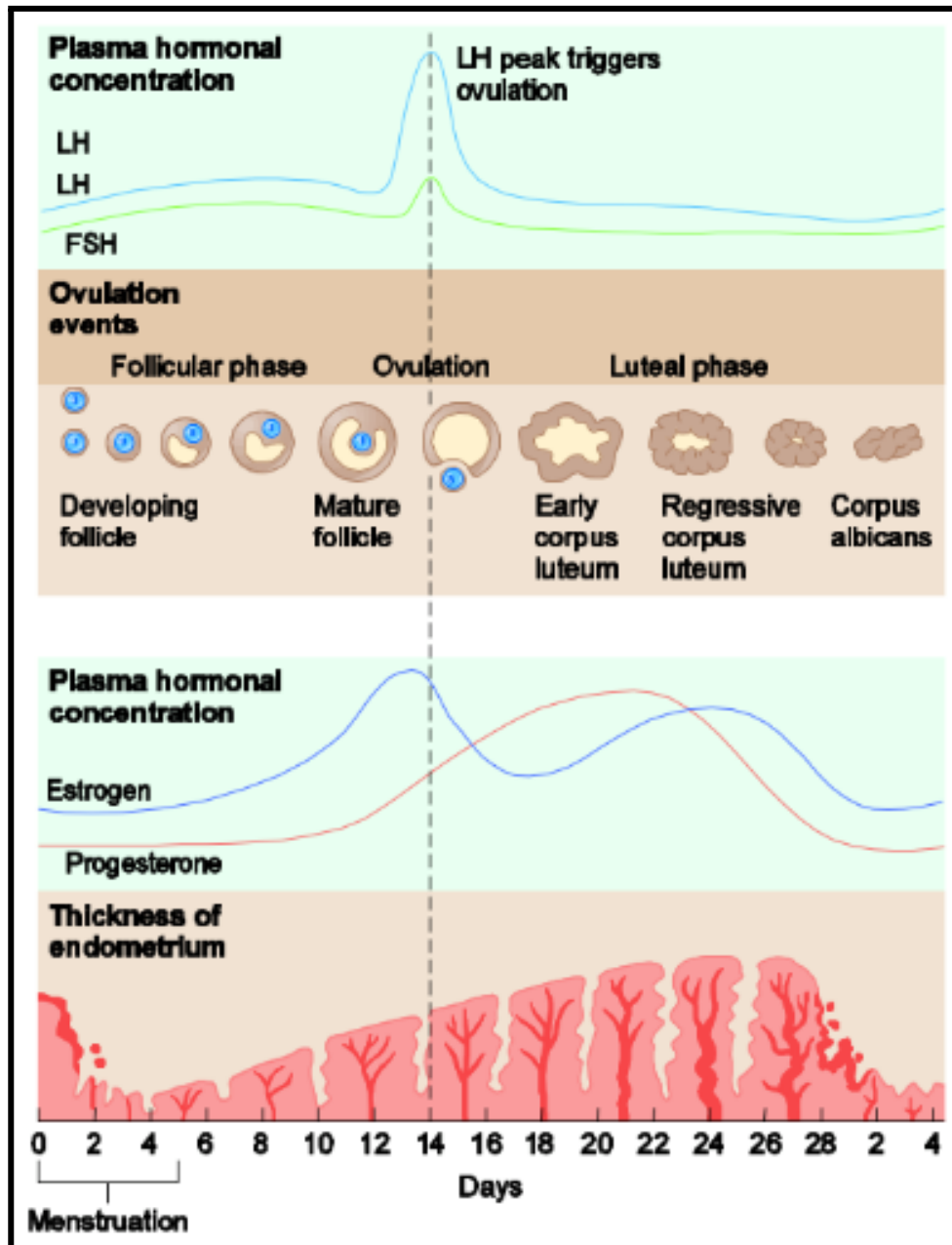
2. Where are oestrogen and progesterone produced and explain their role in the development of secondary sex characteristics.

Development of secondary sex characteristics in males.



3. Where is testosterone produced and explain its role in the development of secondary sex characteristics.

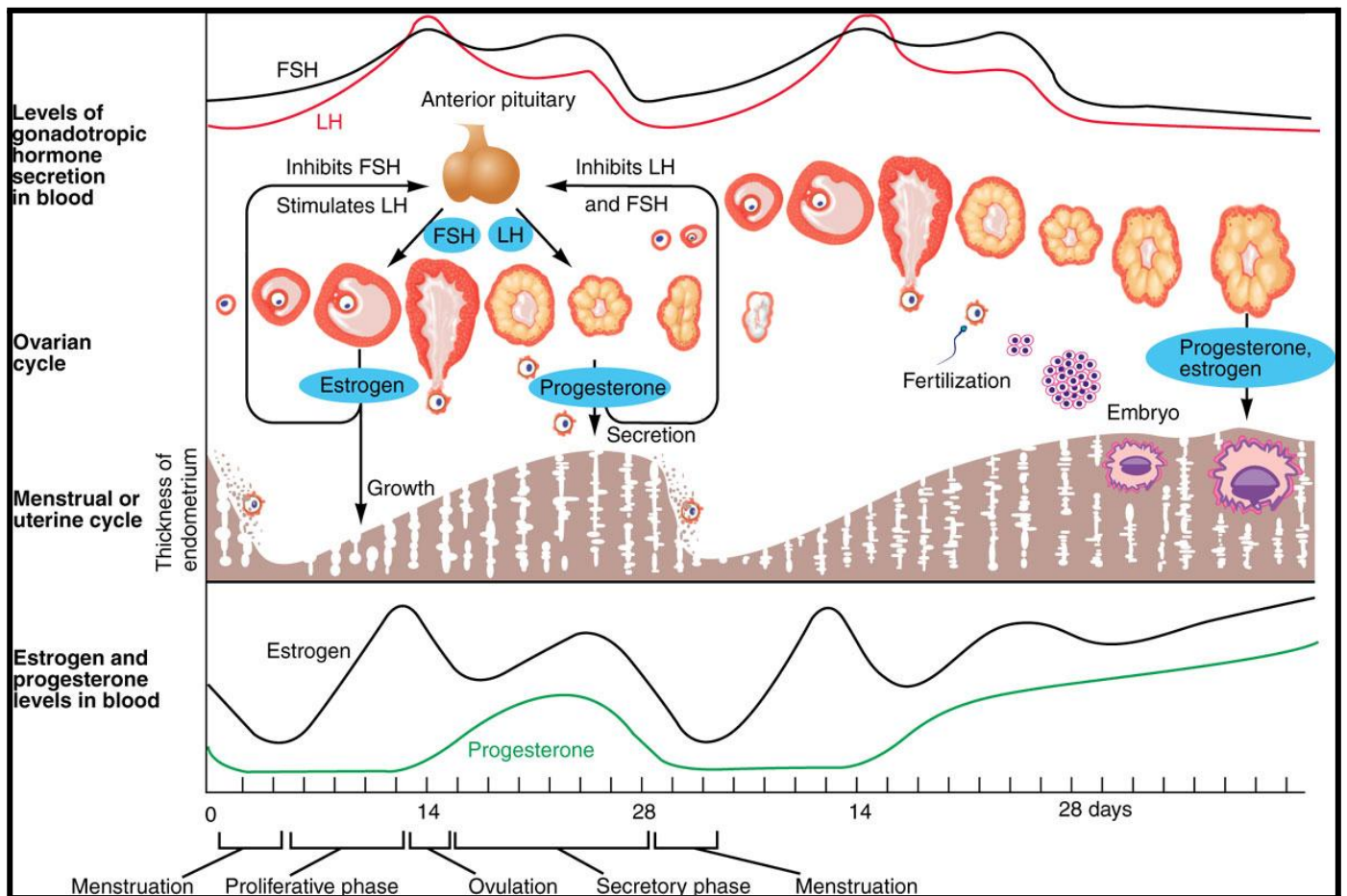
The Menstrual Cycle.



HT Only - Menstrual Cycle key questions.

- Describe the effect of increasing levels of FSH in the blood on the production of Oestrogen?
- Explain the interaction between these hormones.

HT - Menstrual Cycle.



6. With reference to negative feedback, describe the effect of the increasing the blood concentration of oestrogen on the secretion of FSH & LH?

[illegible]

- [illegible]

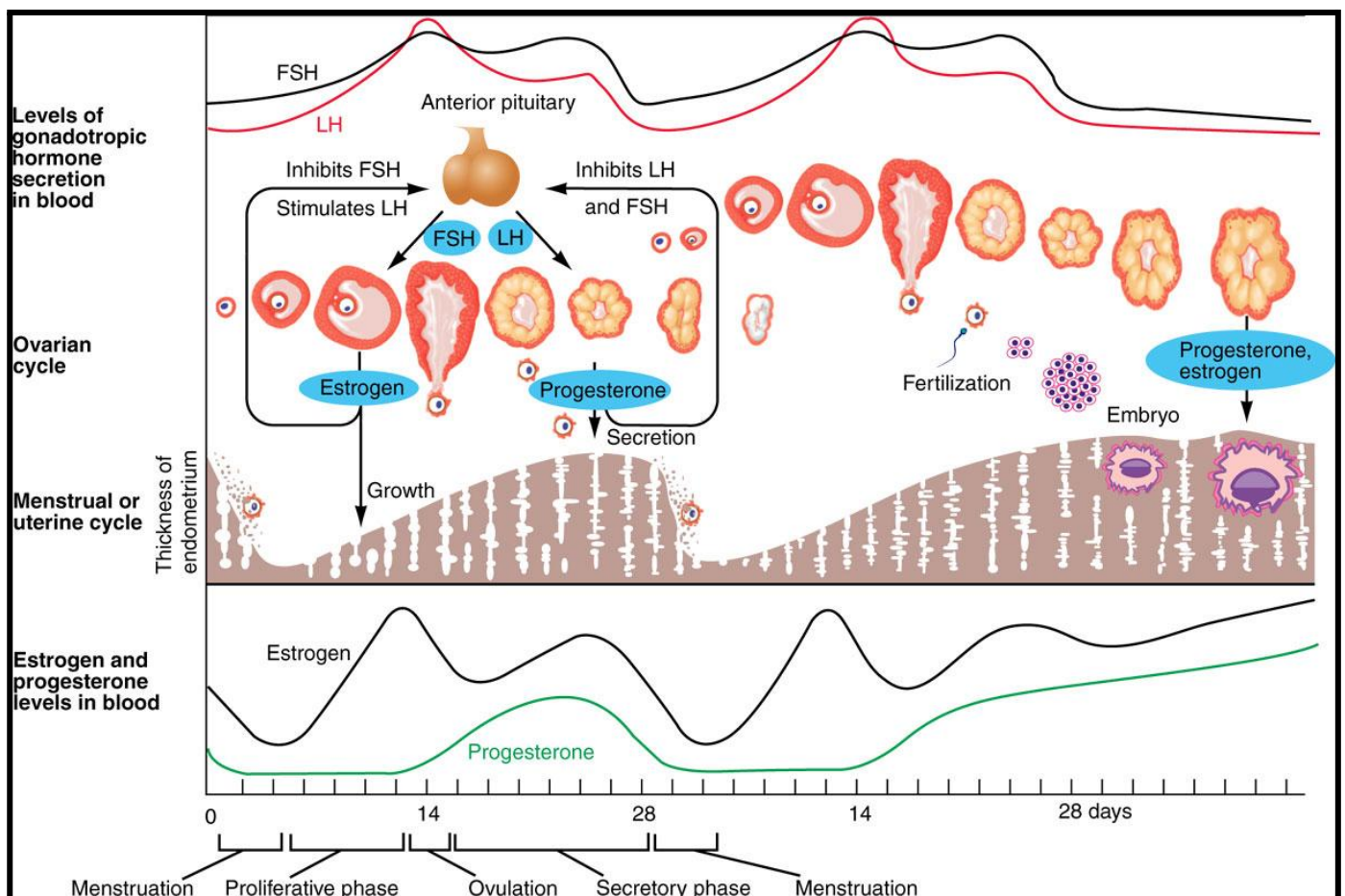
Contraception

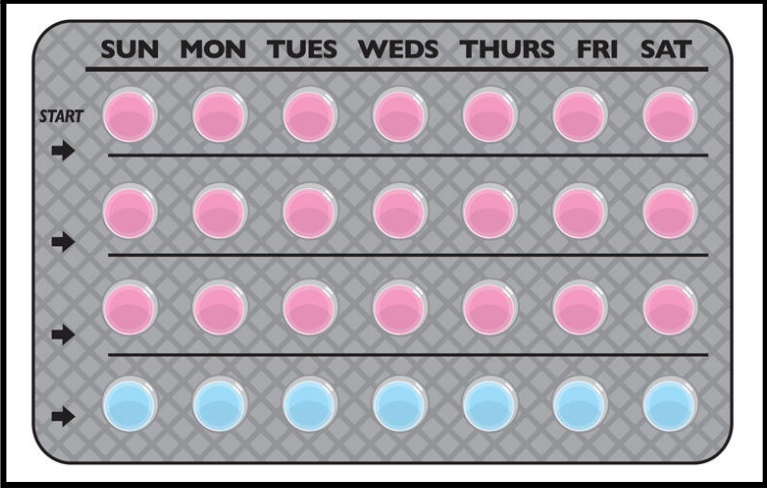
→ Evaluate the different hormonal and non-hormonal methods of contraception.

Fertility can be controlled by a variety of hormonal and nonhormonal methods of contraception. These include:

1. oral contraceptives that contain hormones to inhibit FSH production so that no eggs mature
2. injection, implant or skin patch of slow release progesterone to inhibit the maturation and release of eggs for a number of months or years
3. barrier methods such as condoms and diaphragms which prevent the sperm reaching an egg
4. intrauterine devices which prevent the implantation of an embryo or release a hormone
5. spermicidal agents which kill or disable sperm
6. abstaining from intercourse when an egg may be in the oviduct
7. surgical methods of male and female sterilisation.

Key questions

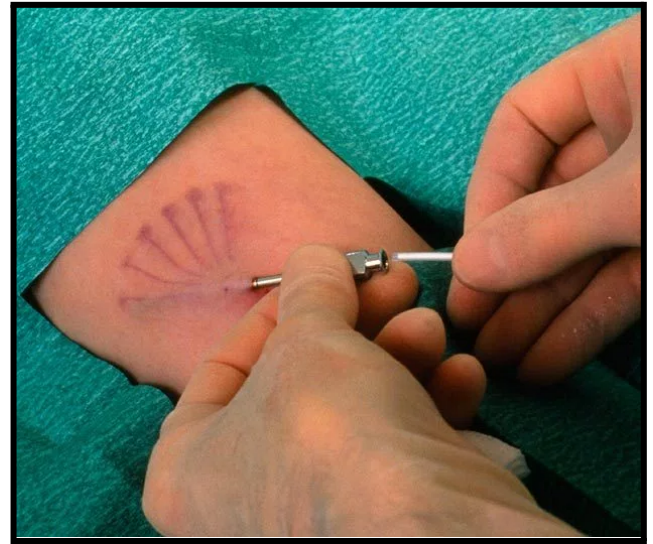
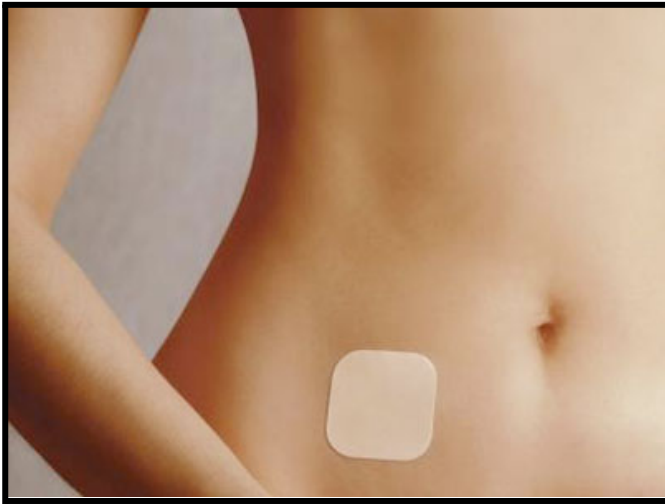




1. How do oral contraceptives containing oestrogen only, work as a method of contraception?
2. Contraceptive pills containing oestrogen are taken for 21 days before having a break of 7 days. The fourth row of pills in this pack are dummy sugar pills. Explain why.

[illegible]

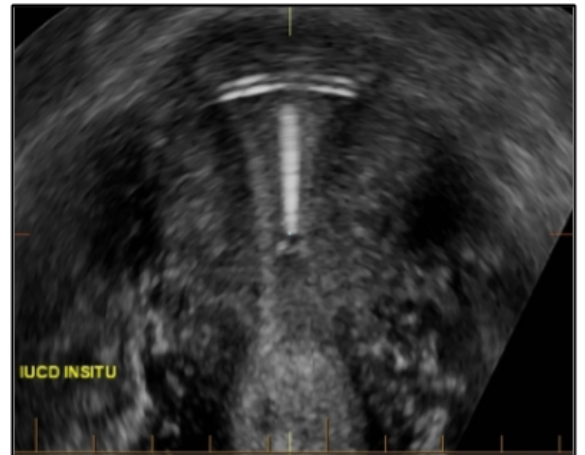
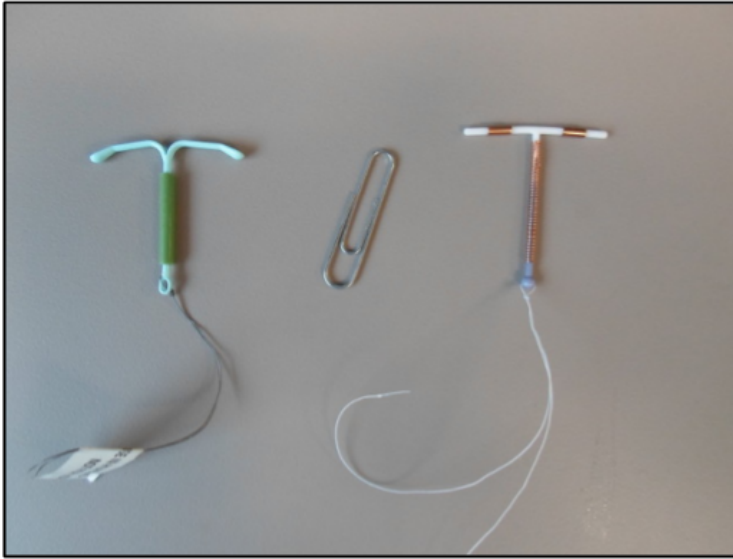
Progesterone implants & patches



3. How does taking progesterone in the form of an implant or skin patch prevent pregnancy?
4. What are the advantages of these methods over taking a contraceptive pill?

[illegible]

IUD - Hormonal & Copper.



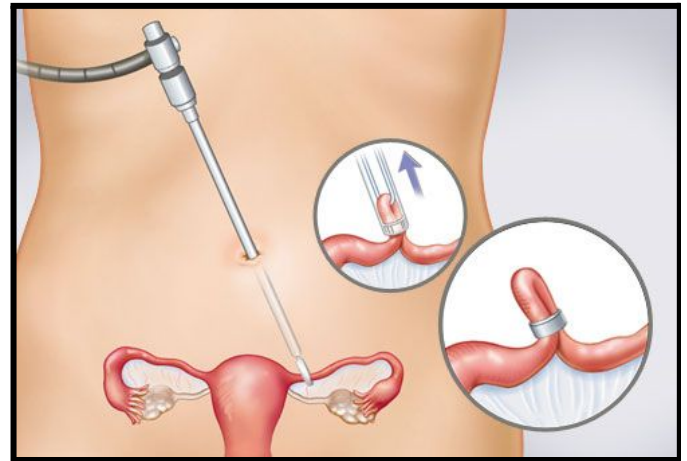
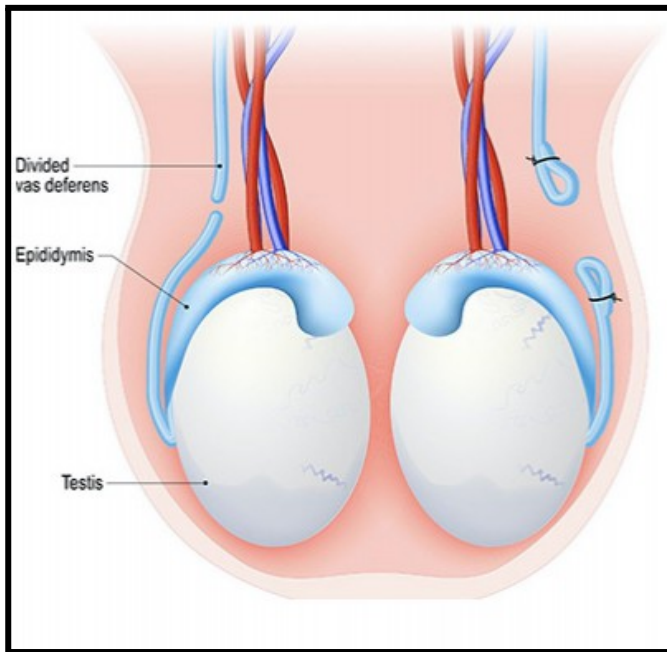
5. What does IUD mean?
6. Why are some IUDs made of copper?
7. What is the advantage of the IUD releasing progesterone into the uterus?
8. An IUD can last 5 - 10 years. They need to be inserted and removed by specialist medical staff via a medical procedure. Evaluate the use of an IUD.

Barrier Methods



9. What are the two barrier methods of contraception? Explain how they work.
10. Evaluate the use of these two methods in terms of pregnancy and STD prevention.
11. How can these methods of contraception be enhanced to make them more effective at preventing pregnancy?

Vasectomy & Tubal ligation.



12. Explain how these methods work?
13. Evaluate the effectiveness of these as methods of contraception.

[illegible]

The use of hormones to treat infertility (HT only)

Students should be able to explain the use of hormones in modern reproductive technologies to treat infertility.

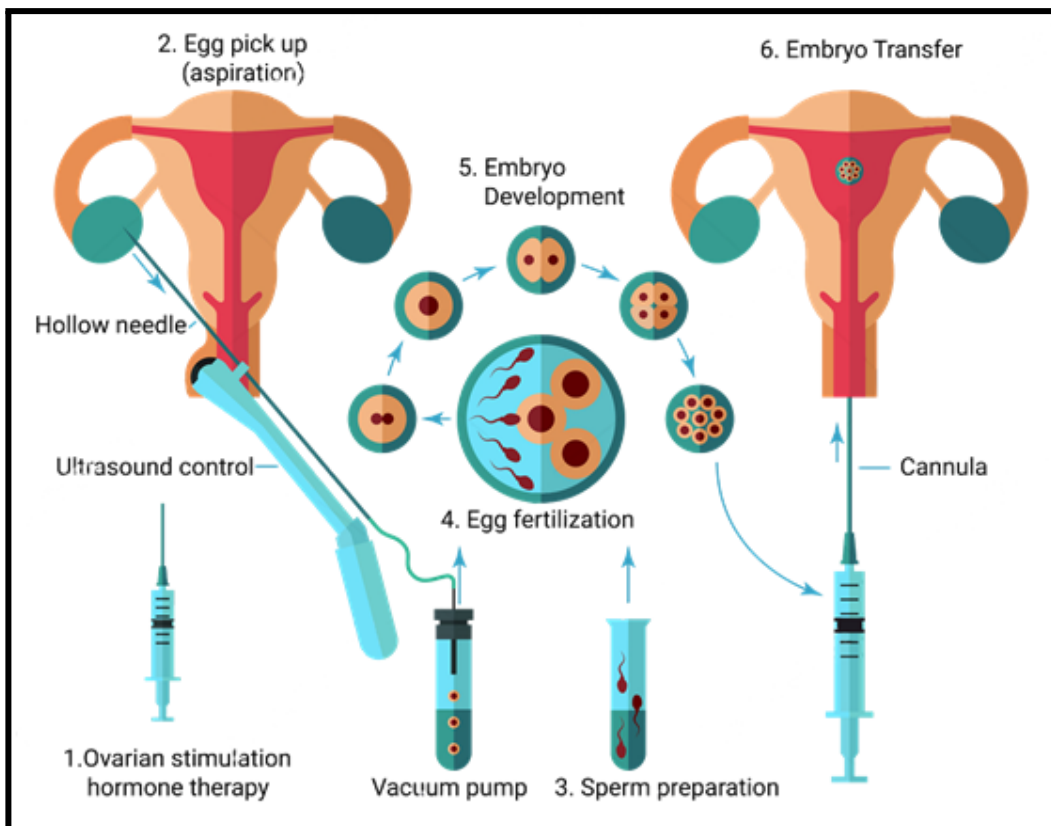
This includes giving FSH and LH in a 'fertility drug' to a woman. She may then become pregnant in the normal way. In Vitro Fertilisation (IVF) treatment.

1. IVF involves giving a mother FSH and LH to stimulate the maturation of several eggs.
2. The eggs are collected from the mother and fertilised by sperm from the father in the laboratory.
3. The fertilised eggs develop into embryos.
4. At the stage when they are tiny balls of cells, one or two embryos are inserted into the mother's uterus (womb).

Although fertility treatment gives a woman the chance to have a baby of her own:

1. it is very emotionally and physically stressful
2. the success rates are not high
3. it can lead to multiple births which are a risk to both the babies and the mother.

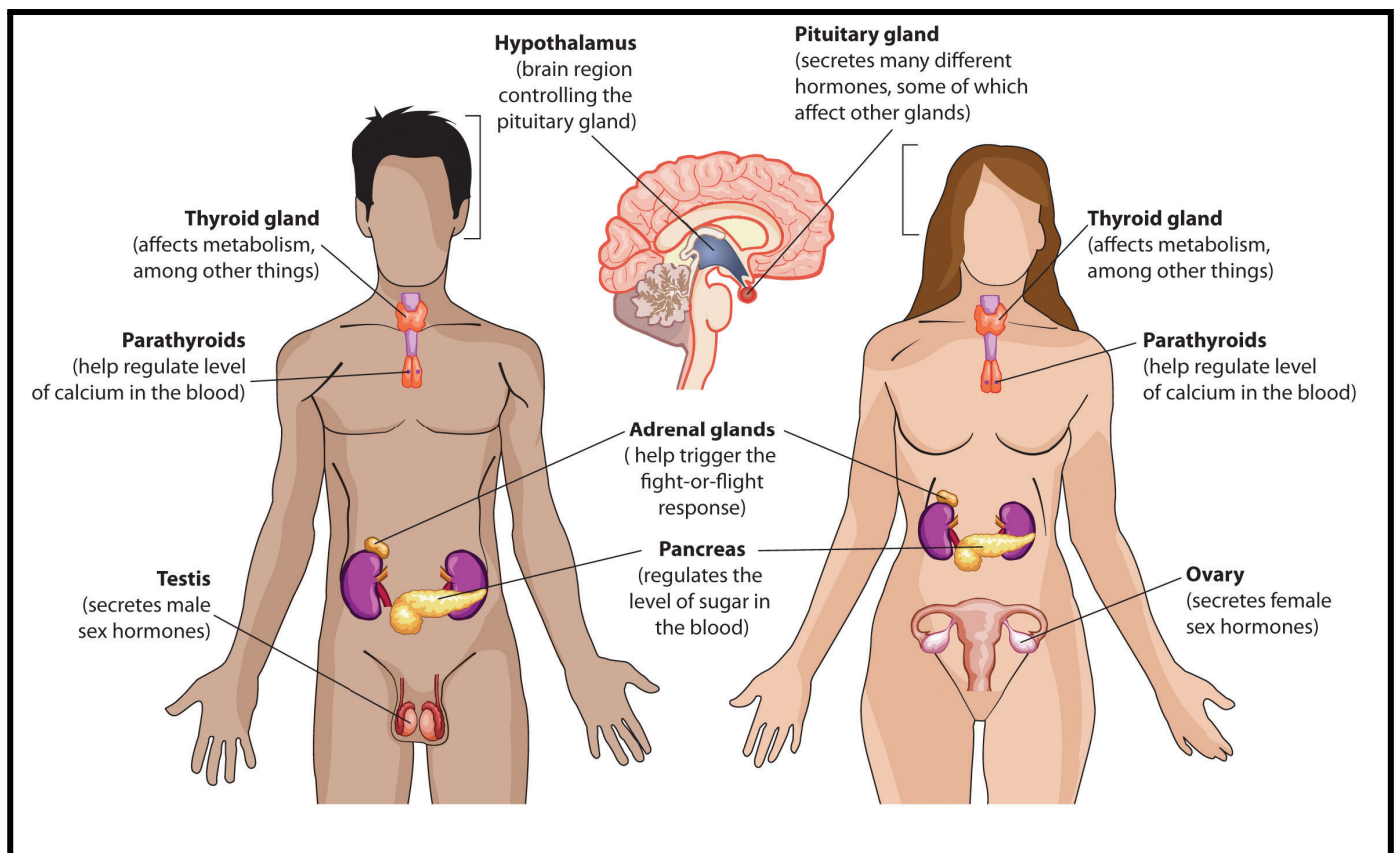
Key Questions HT only



1. What does IVF stand for?
2. What hormones are usually present in a fertility drug given to a woman who is trying to conceive?
3. Describe the 4 main stages of the IVF process.
4. Evaluate the use of IVF for couples who wish to have a child.

Negative feedback (HT only)

- Students should be able to explain the roles of thyroxine and adrenaline in the body.
- Adrenaline is produced by the adrenal glands in times of fear or stress. It increases the heart rate and boosts the delivery of oxygen and glucose to the brain and muscles, preparing the body for 'flight or fight'.
- Thyroxine from the thyroid gland stimulates the basal metabolic rate. It plays an important role in growth and development.
- Thyroxine levels are controlled by negative feedback.



Key Questions.

1. What does the term 'fight or flight' mean?
2. Which gland is responsible for producing adrenaline and where is it located?
3. How does adrenaline secretion prepare the body for stressful situations?
4. Which gland produces thyroxine?
5. What is the main role of thyroxine in the body?

[illegible]