

**What is homeostasis?**

The \_\_\_\_\_ of the internal \_\_\_\_\_ of a cell or organism to maintain \_\_\_\_\_ conditions for function, in response to \_\_\_\_\_ and \_\_\_\_\_ changes.

**Keywords:** internal, conditions, external, optimum, regulation

**Name three things that are controlled by homeostasis.**

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**Choose the correct answer:**

Homeostasis is a voluntary/involuntary control system that involves nervous or chemical responses.

All control systems include receptors, effectors and coordination centres. Add examples of the parts of the body that carry out these roles in the space in the boxes.

**Keywords:** brain, specialised cells, muscles, spinal cord, glands, pancreas

**receptors**

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Bring about responses to restore optimum levels.

**coordination centres**

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Detect stimuli.

**effectors**

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Receive and process information.

Draw one line from each box to connect it to its role.

**What is the role of the nervous system?**

To react to the \_\_\_\_\_.  
To \_\_\_\_\_ our behaviour.

**What does CNS stand for?**

\_\_\_\_\_

**Which two organs make up the CNS?**

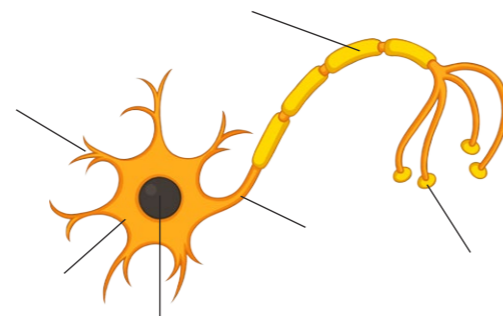
\_\_\_\_\_

**What is the function of the nerve cell?**

To carry \_\_\_\_\_ rapidly around the body.

**Label the nerve cell diagram:** the nucleus, cell body, dendrites, axon, myelin sheath and synapse.

Next to each adaptation of the nerve cell write the part of the cell that its referring to. Use the labels on the diagram to help you.



It can make lots of connections to other nerve cells.

\_\_\_\_\_

It's very long to carry the nerve impulse a long way.

\_\_\_\_\_

It's insulated so the impulses travel rapidly.

\_\_\_\_\_

It has lots of mitochondria to transfer the energy needed to make transmitter chemicals.

\_\_\_\_\_

**Put the following terms into a flow diagram to summarise how the nervous system works.**

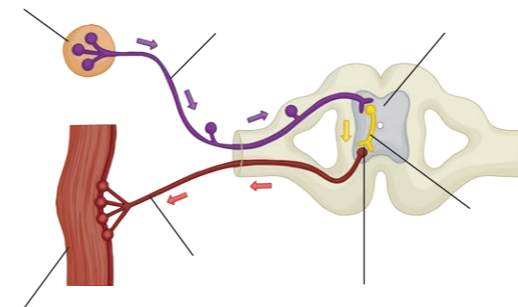
effector, stimulus, response, CNS, receptor



**Why are reflexes important?**

Reflexes happen r \_\_\_\_\_ and a \_\_\_\_\_, you don't have to \_\_\_\_\_ about them. This helps you to avoid d \_\_\_\_\_/h \_\_\_\_\_. Bodily functions like \_\_\_\_\_ and \_\_\_\_\_ happen via reflexes.

**Label the diagram below with the following key parts of a reflex arc:** receptor, spinal cord, motor neurone, sensory neurone, relay neurone, synapse, effector



**Organise the steps of a reflex arc below into the correct order by numbering each box from 1-8.**

At the synapse a chemical is released, it diffuses across the synapse.	
The impulse reaches the effector which is stimulated to respond.	
The receptor is stimulated.	
When the impulse reaches the next synapse, a chemical is released which travels across the synapse.	
This triggers an electrical impulse in the relay neurone.	
An electrical impulse travels along the sensory neurone to the CNS.	
This triggers an electrical impulse in the motor neurone.	

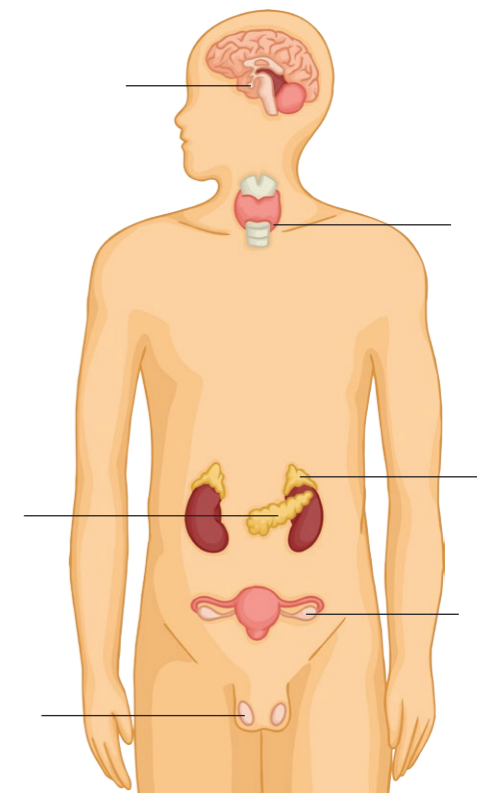
**Complete the paragraphs using the keywords:**

hormones, chemical, blood stream, slower, organs, blood, receptors, longer, glands.

The endocrine system produces a \_\_\_\_\_ response to a stimulus. The \_\_\_\_\_ of the endocrine system secrete \_\_\_\_\_ into the \_\_\_\_\_.

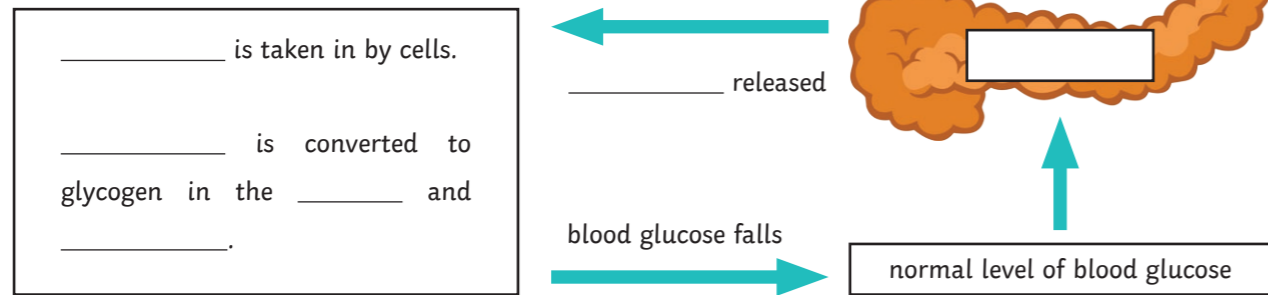
The \_\_\_\_\_ carries \_\_\_\_\_ to target \_\_\_\_\_ which have \_\_\_\_\_ to pick up the hormone. Hormonal effects are \_\_\_\_\_ than the nervous system but last for \_\_\_\_\_.

**Label the main endocrine glands shown in the diagram using the following keywords:** thyroid, pituitary gland, testes, adrenal gland, pancreas, ovaries.



Complete the boxes to show how insulin controls blood glucose levels.

Keywords: glycogen, liver, glucose, pancreas, insulin, muscles.



What causes type 1 diabetes?

The \_\_\_\_\_ does not make enough \_\_\_\_\_, so blood glucose isn't controlled and it gets very \_\_\_\_\_ after eating a meal.

When does type 1 diabetes usually start?

How is type 1 diabetes treated?

What causes type 2 diabetes?

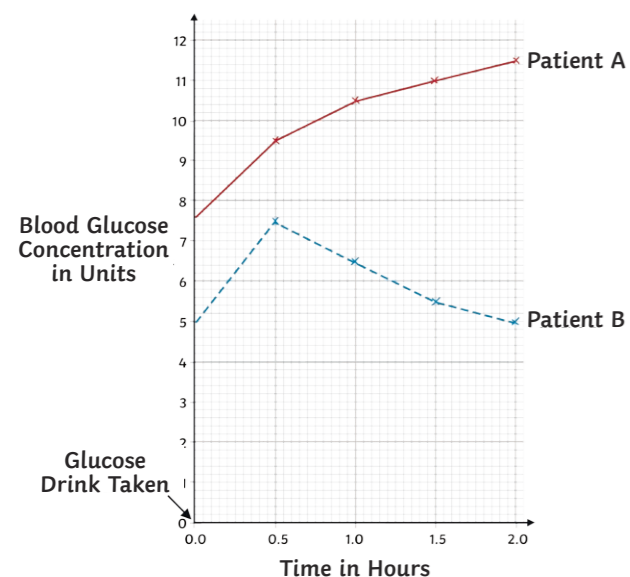
The cells in the body no longer respond to the \_\_\_\_\_ that is produced by the \_\_\_\_\_.

What are the risk factors for type 2 diabetes?

How is type 2 diabetes treated?

Which patient has diabetes?

How do you know?



Draw one line from each hormone to the role it plays in menstruation. One role will be connected to two hormones.

follicle stimulating hormone (FSH)	Maintains the uterus lining.
luteinising hormone (LH)	Stimulates the release of an egg.
oestrogen	
progesterone	Causes maturation of an egg in the ovary.

Write the number of each of the following methods of contraception next to the way that they work:

- oral contraceptive
- barrier methods (condoms or diaphragms)
- abstinence
- surgical methods
- intrauterine devices
- progesterone (via implant, injection or skin patch)
- spermicidal agents

Contains hormones that inhibit FSH production so that no eggs mature.

Inhibits the maturation and release for a number of months or years.

Prevents the sperm reaching an egg.

Prevent the implantation of the embryo or releases a hormone.

Kill or disable sperm.

Avoids intercourse when an egg might be in the oviduct.

Sterilise the male or female by cutting or tying tubes to prevent the egg or sperm reaching their target area.

The following is a method for measuring reaction time.

- Person 1 sits upright on the chair with eyes focussing across the room.
- Person 1 puts the forearm of their dominant arm across the table with their hand hanging over the edge.
- Person 2 holds a ruler vertically with the bottom end of the ruler between person 1's finger and thumb. Person 1 mustn't be hold the ruler.
- Person 1 tells person 2 to be prepared to catch the ruler.
- Person 2 lets go of the ruler and person 1 catches the ruler with their thumb and first finger as quickly as possible as it drops.
- The number on the ruler that is level with person 1's thumb is recorded.
- Both people have a rest and then the test is repeated several times.



What is the dependent variable in this investigation?

The average distance before person 1 catches the ruler is 14cm. They swap roles and person 2 catches the ruler, their average distance before catching it is 12cm.

Who has the fastest reaction time?

How do you know?

**a**  
 What is homeostasis?  
 The **regulation** of the internal **conditions** of a cell or organism to maintain **optimum** conditions for function, in response to **internal** and **external** changes.  
 Keywords: internal, conditions, external, optimum, regulation

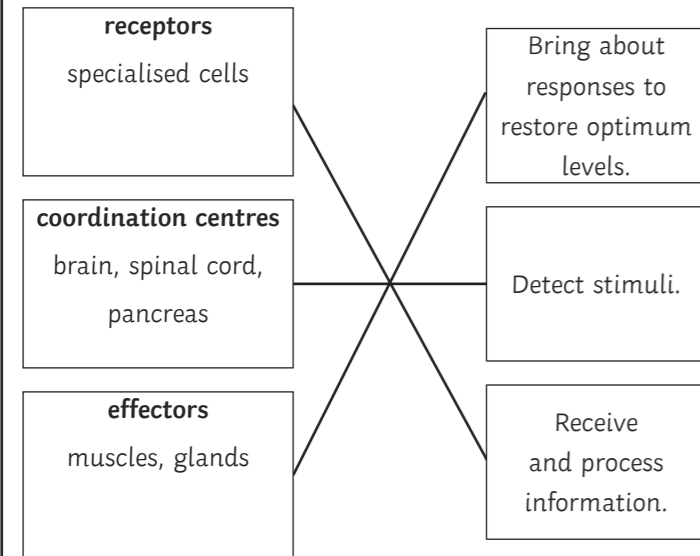
**b**  
 Name three things that are controlled by homeostasis.  
 1. **blood glucose concentration**  
 2. **body temperature**  
 3. **water levels**

Choose the correct answer:  
 Homeostasis is a **involuntary** control system that involves nervous or chemical responses.

All control systems include receptors, effectors and coordination centres. Add examples of the parts of the body that carry out these roles in the space in the boxes.

Keywords: brain, specialised cells, muscles, spinal cord, glands, pancreas

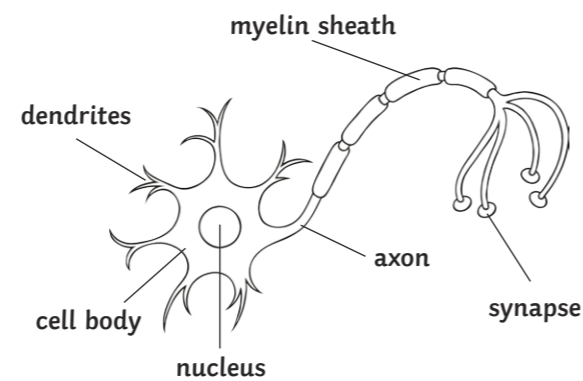
Draw one line from each box to connect it to its role.



**d**  
 What is the role of the nervous system?  
 To react to the **surroundings**.  
 To **coordinate** our behaviour.  
 What does CNS stand for?  
**central nervous system**  
 Which two organs make up the CNS?  
**brain and spinal cord**

**e**  
 What is the function of the nerve cell?  
 To carry **electrical impulses** rapidly around the body.  
 Label the nerve cell diagram: the nucleus, cell body, dendrites, axon, myelin sheath and synapse.

Next to each adaptation of the nerve cell write the part of the cell that its referring to. Use the labels on the diagram to help you.

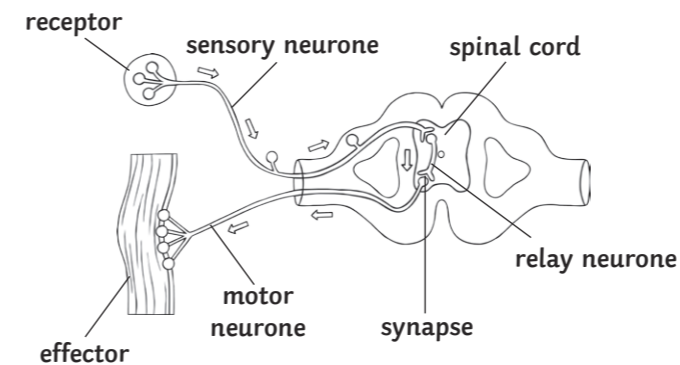


It can make lots of connections to other nerve cells.  
**dendrites**  
 It's very long to carry the nerve impulse a long way.  
**axon**  
 It's insulated so the impulses travel rapidly.  
**axon**  
 It has lots of mitochondria to transfer the energy needed to make transmitter chemicals.  
**cell body (specifically, cytoplasm)**

**g**  
 Put the following terms into a flow diagram to summarise how the nervous system works.  
 effector, stimulus, response, CNS, receptor  
**stimulus → receptor → CNS → effector → response**

**h**  
 Why are reflexes important?  
 Reflexes happen **rapidly** and **automatically**, you don't have to **think** about them. This helps you to avoid **danger/harm**. Bodily functions like **breathing** and **food digestion** happen via reflexes.

**i**  
 Label the diagram below with the following key parts of a reflex arc: receptor, spinal cord, motor neurone, sensory neurone, relay neurone, synapse, effector



Organise the steps of a reflex arc below into the correct order by numbering each box from 1-8.

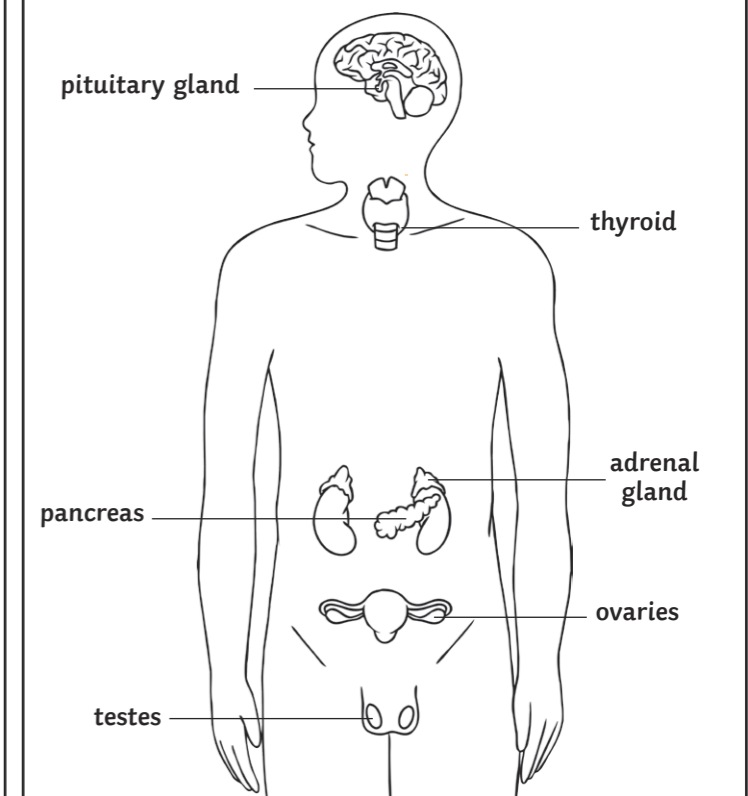
At the synapse a chemical is released, it diffuses across the synapse.	3
The impulse reaches the effector which is stimulated to respond.	7
The receptor is stimulated.	1
When the impulse reaches the next synapse, a chemical is released which travels across the synapse.	5
This triggers an electrical impulse in the relay neurone.	4
An electrical impulse travels along the sensory neurone to the CNS.	2
This triggers an electrical impulse in the motor neurone.	6

**j**  
 Complete the paragraphs using the keywords: hormones, chemical, blood stream, slower, organs, blood, receptors, longer, glands.

The endocrine system produces a **chemical** response to a stimulus. The **glands** of the endocrine system secrete **hormones** into the **blood stream**.

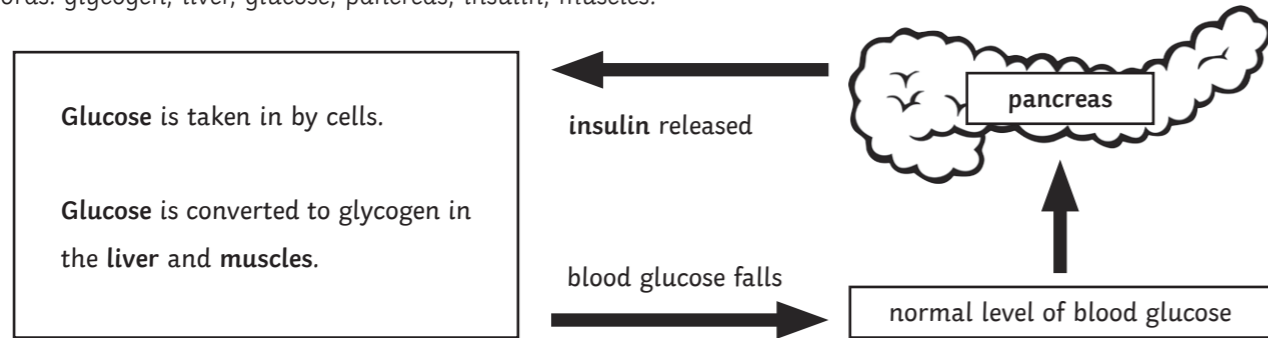
The **blood** carries **hormones** to target organs which have **receptors** to pick up the hormone. Hormonal effects are **slower** than the nervous system but last for **longer**.

**k**  
 Label the main endocrine glands shown in the diagram using the following keywords: thyroid, pituitary gland, testes, adrenal gland, pancreas, ovaries.



Complete the boxes to show how insulin controls blood glucose levels.

Keywords: glycogen, liver, glucose, pancreas, insulin, muscles.



What causes type 1 diabetes?

The **pancreas** does not make enough **insulin**, so blood glucose isn't controlled and it gets very **high** after eating a meal.

When does type 1 diabetes usually start?

**In children and teenagers.**

How is type 1 diabetes treated?

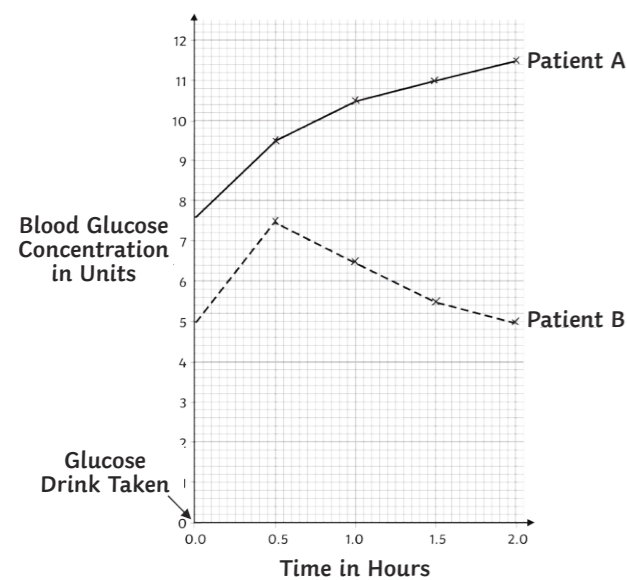
**With insulin injections.**

Which patient has diabetes?

**patient A**

How do you know?

**Their blood glucose concentration continues to rise after they have the drink, while patient B's returns to normal.**



What causes type 2 diabetes?

The cells in the body no longer respond to the **insulin** that is produced by the **pancreas**.

What are the risk factors for type 2 diabetes?

**Obesity and lack of exercise.**

How is type 2 diabetes treated?

**A carbohydrate controlled diet and an exercise routine.**

What is the main reproductive hormone in the female?

**oestrogen**

What is ovulation?

**When a mature egg is released from an ovary.**

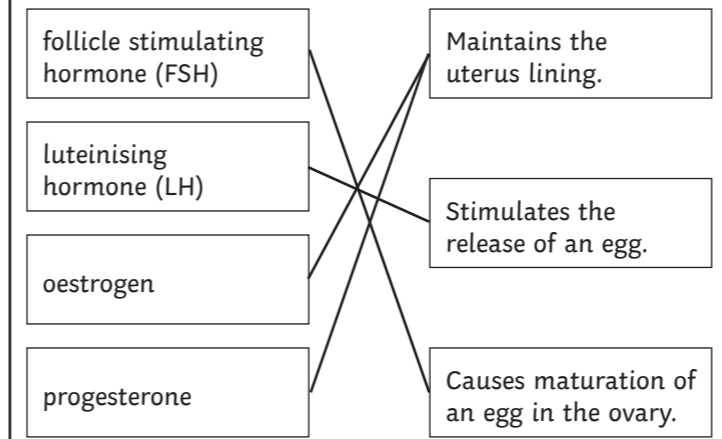
What is the main reproductive hormone in the male?

**testosterone**

What does this hormone do?

**Stimulates sperm production.**

Draw one line from each hormone to the role it plays in menstruation. One role will be connected to two hormones.



Write the number of each of the following methods of contraception next to the way that they work:

- oral contraceptive
- barrier methods (condoms or diaphragms)
- abstinence
- surgical methods
- intrauterine devices
- progesterone (via implant, injection or skin patch)
- spermicidal agents

Contains hormones that inhibit FSH production so that no eggs mature. **1**

Inhibits the maturation and release for a number of months or years. **6**

Prevents the sperm reaching an egg. **2**

Prevent the implantation of the embryo or releases a hormone. **5**

Kill or disable sperm. **7**

Avoids intercourse when an egg might be in the oviduct. **3**

Sterilise the male or female by cutting or tying tubes to prevent the egg or sperm reaching their target area. **4**

The following is a method for measuring reaction time.

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What is the dependent variable in this investigation?  
**The distance on the ruler before person 1 catches it.**

The average distance before person 1 catches the ruler is 14cm. They swap roles and person 2 catches the ruler, their average distance before catching it is 12cm.

Who has the fastest reaction time?  
**person 2**

How do you know?  
**They caught the ruler in the least amount of time, because less of the ruler had passed through their finger and thumb before they caught it.**