Reflex Reactions
Reflex Reactions

Reflexes

A reflex arc

Summary activities
Common reflexes

What types of reflexes can you think of?
What are reflexes?

Reflexes are fast, automatic, protective biological control systems that link a stimulus to a response.

Reflex reactions happen without you having to think about them – they are involuntary.

This is because the **central nervous system (CNS)** sends electrical signals to the muscles before the brain can pick up and process the message.

Many reflexes, such as sneezing and focusing your eyes, occur naturally, but other reflexes can be learned, i.e. **conditioned responses**.
Why are reflexes so fast?

Reflexes need to be fast in order to **protect** the body. If you pick up a hot plate, the reflex action will make you drop it almost immediately. This is to protect your hand from burning.

The quicker you drop the plate, the less damage will be done to your hand.

However, we can consciously override reflexes. If the hot plate had your dinner on it, you might try to resist the reflex to drop it so that you can put it down safely.

Reflexes happen so quickly because they often only involve three neurones – **sensory**, **relay** and **motor** neurones.
The knee-jerk reflex

You can demonstrate a simple reflex now.

- Cross one leg over the other.
- Find the hollow just below your kneecap in the top leg.
- Hold your hand flat and hit this point with the little-finger side of your hand.

What happens?

This is called the knee-jerk reflex. Doctors sometimes use the knee-jerk reflex to check whether a person’s nervous system is working properly.
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  - A reflex arc
  - Summary activities
What is a reflex arc?

A reflex arc is the simplest network formed from different types of neurones.

Press "start" to find out more.
What is the sequence of events in a reflex arc?

1. Signal travels along sensory neurone.
2. Signal reaches muscle (or gland).
3. Muscle responds (or gland releases chemicals).
4. Signal passes from relay neurone to motor neurone.
5. Stimulus is detected by receptors.
6. Signal passes from sensory neurone to relay neurone.
What are relay neurones?

**Relay neurones** are found in the central nervous system, and relay messages from one side of the CNS to the other. They usually connect sensory neurones to motor neurones.
What are effectors?

Motor neurones bring messages to **effectors** – the organs that actually carry out the response. Effectors can be glands or muscles.

A gland responds by releasing chemical substances. One example of this is the salivary glands releasing saliva when somebody smells food.

A muscle responds by contracting, and this often causes a part of the body to move. Reflexes involving muscles include the knee-jerk, moving your hand from a hot plate and your pupil getting smaller in bright light.
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<th><strong>Key terms</strong></th>
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<tr>
<td>receptor</td>
<td>detects the stimulus</td>
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<tr>
<td>relay neurone</td>
<td>carries the message from the receptor to the CNS</td>
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<tr>
<td>sensory neurone</td>
<td>carries out the actual response</td>
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<tr>
<td>motor neurone</td>
<td>carries the message from the CNS to the effector</td>
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<td>effector</td>
<td>transfers the message across the CNS</td>
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Glossary of keywords: reflex reactions

**cell body** – The main part of a cell, which contains the cytoplasm and nucleus.

**central nervous system (CNS)** – The system that co-ordinates the body's responses to **stimuli**. It includes the brain and spinal cord.

**conditioned response** – A reflex that is learned, such as instantly putting your hand up in class when you know the answer to a question.
How will you react to this quiz? See how much you know about reflex responses.

Press "start" to begin.