

Nervous System

Background

The aim of this session is to introduce students (aged 5-11) to the nervous system. Students will have the opportunity to discuss what they already know about the brain and learn that the brain communicates with the rest of the body using the nervous system. This information sheet should be used in conjunction with the 'Primary-Nervous System PPT' PowerPoint presentation.

Introducing the Brain

'Scientist says'

(Slide 1) Title slide. **(2)** A great way to start any session is to get the students moving around. Based on the familiar children's game 'Simon says', 'Scientist says' will introduce the students to the brain, its multiple functions and allow you to explore their previous knowledge and level.

Ask the class to stand up and find some space around them. Although the rules may be familiar to them, reiterate that they must only carry out the action when you begin with 'Scientist says'. Ask each student to sit down when they incorrectly carry out an action without 'Scientist says' included beforehand.

Possible actions could include: Wave your left arm, lift your right leg, wiggle your nose, stick out your tongue.

When the game is complete, instruct students to sit down and ask them what they think is responsible for carrying out these actions (you may encourage answers of the brain by pointing to your own head). Emphasise that the brain has many jobs, not just in making actions happen but also stopping them as well.

(3) Ask the students what else they know about the brain. This is also a good opportunity for you to tell the students some interesting brain facts, including:

- 'The human adult brain is just a bit heavier than a bag of sugar' (1.3kg).'

- 'The top of the brain looks similar to a walnut with a wrinkly part on top. If the brains wrinkles were spread out, it would be about the size of 4 pieces of paper' (A4).
- 'The brain floats around in a clear(ish) liquid, like water, protected by a hard skull because it is soft and may be damaged easily.'

(4) Ask the students what they think the machine is/does. Inform them that this is a brain scanner and allows scientists to see inside people's heads and their brains, as shown in the accompanying MRI image.

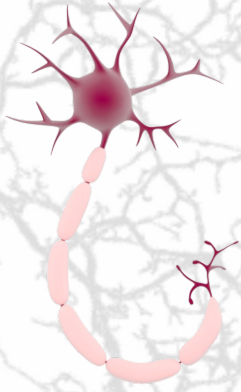
(5) With the latest technology we can see how the brain is connected, like in this video.

Summarise by informing the students that the brain is the control centre for the body and incredibly important for everything we do. It makes us who we are!

Tip: Visual aids (e.g. model of the brain) may help you keep the attention of the students and boost your own confidence. If a screen is available, you could use a 3D brain model such as the one found at brainfacts.org/3d-brain.



How does the brain communicate with the body



N.B. You may wish to include the 'making a neuron' introduction and activity from the module 'Neurons', before talking about the nervous system.

In this next activity, students will be introduced to the divisions of the nervous system and how they allow the brain to communicate with the rest of the body.

(6) Ask the students to suggest how the brain talks to the rest of the body to help us move e.g. wiggle our little finger (refer back to 'Scientist says' activity). After taking suggestions, use the analogy of a delivery driver. Ask the students how a delivery driver gets across town to deliver a letter or package. Take suggestions leading to answer of a network of roads and equate this to how our body has a network of nerves which is called the nervous system **(7)** and which allows the brain to send messages to the rest of the body.

(8) For upper primary school age groups, you may wish to introduce students to the divisions of the nervous system i.e. central nervous system (brain and spinal cord) which then sends out neurons to the rest of the body via the peripheral nervous system - similar to a motorway and side roads.

Activity - Nervous System

With the following class activity, students will learn how the brain sends messages to the rest of the body.

(9) Select volunteers to act as the brain and different parts of the body (e.g. left leg, right arm), and label each student with a sticky note or similar. Instruct the students to arrange themselves in the approximate shape of a body and set up strings between the head/brain and each body part.

Instruct the students acting as body parts to hold the string, but face away from the brain so they cannot see. When the brain pulls a string, the corresponding student will move that body part.

Explain to the students that the brain sends messages to different parts of body much like when the 'brain' student pulls the string to get a body part to move.

For upper primary school age groups, you may wish to introduce students to idea that these messages are sent as electricity, similar to how we turn on a light.

Inform the students that these electrical messages are sent very quickly - up to 120 metres/second - approximately 3-4 times as fast as your car on the motorway (at 70mph). (*N.B. You could calculate how long it would take to get to the nearest large city for context*).

(10) Ask the students what they think the brain also controls, apart from movements. Take suggestions and inform the students that the brain also allows us to see, hear, taste, feel etc. Therefore, in addition to sending messages the brain also receives them.

Select more volunteers and add them as additional body parts (e.g. eye, ears, mouth) with strings to the brain. Ask the students whether they think that specific body part will send a message to or from the brain. Using the strings, inform the students that the brain receives messages as well as sends them.

You may wish to act out a real life example e.g. a fly may land on your hand, you see the fly, you hear the fly, you feel the fly and these messages are received by the brain. The brain may then send a message to the hand to shake and therefore remove the fly.

