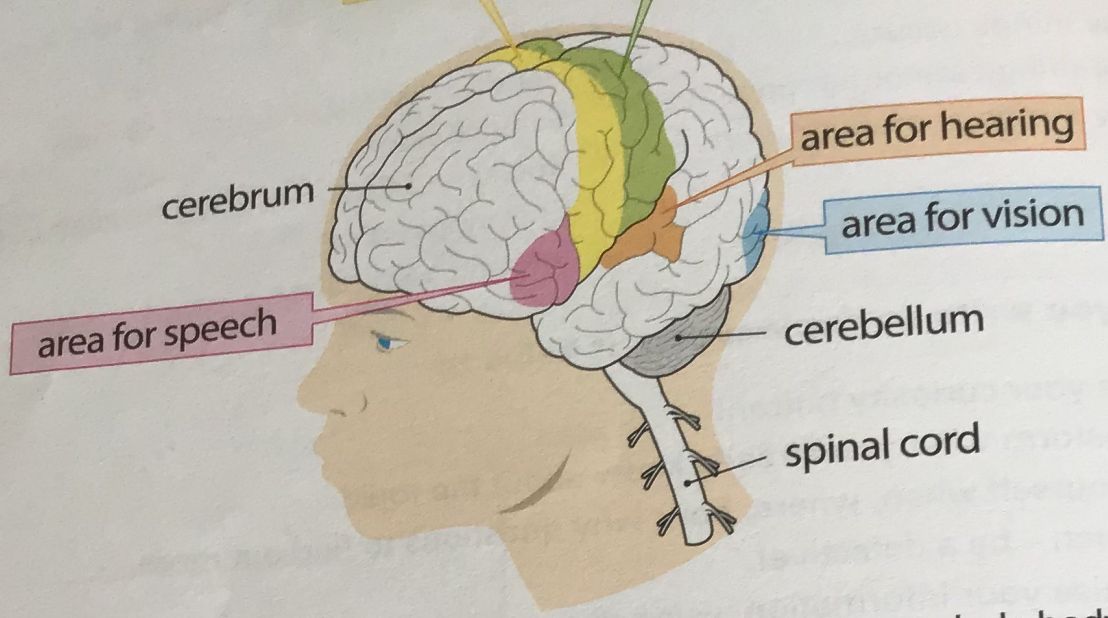


The brain is a living **organ** inside your head, which controls your whole body. It keeps all parts of the body working and is responsible for thoughts, feelings and memory. You also use the brain to make sense of the things you experience.

The brain fits snugly inside a hard bony case called the **skull**. The skull protects the brain, which itself looks like a mass of grey, wrinkled and wobbly jelly. Taking up about half of the space inside the head, an adult's brain weighs about 1.4 kilograms.

The human brain is divided into many different areas, which control the things you do, say, hear, feel, think and see (see diagram). The largest part of the brain is called the cerebrum, which has two sides. The right side of the brain controls the left side of the body and the left side of the brain controls the right side of the body. It has also been discovered that each side of the brain looks after different skills and activities. The right side controls artistic talent and imagination, while the left is responsible for working things out like mathematical problems and **logical** thinking. Below the cerebrum lies the cerebellum, which helps you to balance and co-ordinate your movements.

The brain operates like a computer inside your head. It is linked to the body by the **spinal cord** and **nerves**. Your nerves are like long, thin wires that run all over the body. These operate like telephone wires, sending information to and from the brain in the form of tiny electrical currents. In the human body, there are 100 million nerves. Some carry messages from your five senses to the brain, while others bring instructions from the brain to your muscles. Since the brain acts like the control centre of the body, its job is to keep track of and to make sense of all this information.

The brain is both a fascinating and a truly amazing organ. About the size of two fists, it works automatically day and night and keeps the body ticking over even when you are fast asleep. It controls many things like breathing and sends signals to the nerves at speeds of up to 400 km per hour!

Examine the explanation carefully and answer the following.

1. Underline the sentence which explains what a brain is.
2. Use your dictionary to explain the words in bold type.

organ _____

skull _____

logical _____

spinal cord _____

nerves _____

3. Explain what facts you have understood from this explanation about the human brain, by answering the following.

(a) **When** do you use it? _____

_____

(b) **Where** is it? _____

(c) **What** does it look like? _____

(d) **Why** do we need it? _____

_____

(e) **How** does it work? _____

_____

_____

4. What information about the brain did you find most interesting?

_____

_____

_____

5. Why, do you think, is the brain compared to a computer?

_____

_____

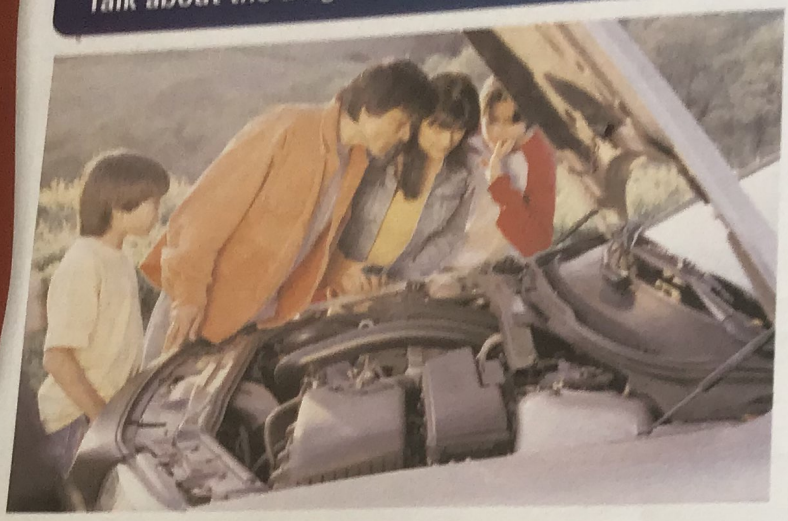
_____

Follow-up Activity

Sometimes the body reacts without waiting for a message from the brain. This is called a reflex action. To observe a reflex action, sit with your legs crossed and ask a friend to tap gently below your kneecap. When the right spot is tapped, your foot will jerk up!

How Does a Car Engine Work?

Talk about the diagram and read the explanation.

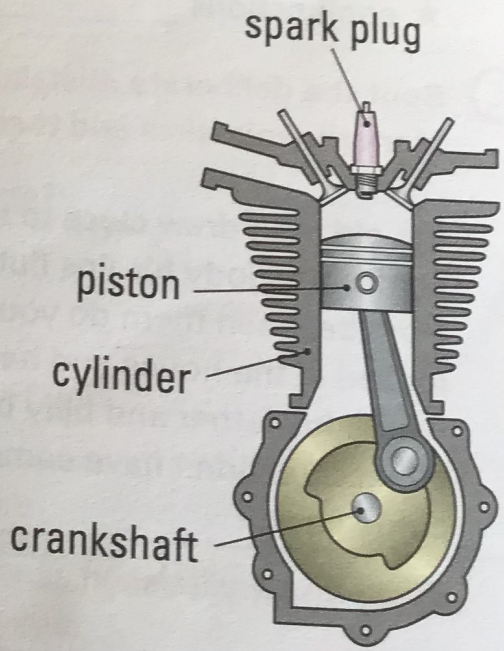


The car, the most popular kind of **transport** in the world, is a road **vehicle** with four wheels and an engine. An engine is a machine which converts energy into mechanical power or movement. Most cars have engines that are powered by **petrol** or gasoline.

Engines are far more powerful than muscles so machines can move much faster than legs. On a motorway, a car can travel at a speed of up to 120 kilometres an hour. The driving force under the bonnet of each car is an internal combustion engine. The engine is a *combustion* engine because it burns or combusts fuel. It is an *internal* combustion engine because the fuel burns inside the engine's cylinder.

Cars need petrol like humans need food. They get the energy to move by burning petrol inside their engines. Petrol, a **fossil fuel**, has energy locked inside it and this energy is set free inside the car engine and it is used to turn the car wheels.

How exactly is this energy released? Petrol is kept in a tank and is pumped along a pipe to the engine. A mixture of air and petrol comes into a cylinder in the engine and a piston squeezes the mixed-up air and petrol into a small space at the top of the cylinder (see diagram). Then an electric spark, caused by turning the ignition key, jumps from a spark plug which is plugged into the top of the cylinder. This causes the petrol and air to explode, pushing the piston back down again. These continuous explosions make the piston move up and down in the cylinder. The up-and-down motion of the piston causes the crankshaft to spin and this turns the wheels round and round. **Emissions** from the burning petrol are pushed out of the engine through the exhaust pipe.



Since burning fossil fuels produces **fumes**, which pollute the environment, the search is on to find another more environmentally friendly means of powering cars. Some modern cars do not burn petrol but use energy from the sun and other sources like electricity, stored in a battery. Cars that run on electricity, for example, are both cleaner and quieter. In fact, the first car to go faster than 100 kilometres an hour was battery-powered. It was called 'La Jamais Contente' and it broke the record over 100 years ago, in 1899!

Examine this Explanation

Examine the explanation carefully and answer the following.

1. Underline the sentences which explain (a) what a car is and (b) what an engine is.
2. Explain the highlighted words from the passage, using a dictionary.

transport _____

vehicle _____

petrol _____

fossil fuel _____

emissions _____

fumes _____

3. Write one fact from the explanation which proves that engines are more powerful than muscles. Write another example of your own.

_____

_____

_____

4. In the explanation find and write another word for each of the following.

petrol _____ combust _____

internal _____ set free _____

5. Write five sentences to explain how a car engine works.

First _____

Then _____

This causes _____

The explosion forces _____

Because of this _____

6. What new and interesting fact have you learned about car engines?

_____

_____

_____

Follow-up Activity

With your teacher or guardian, browse the website at www.sei.ie to explore alternative forms of energy to fossil fuels.

Plan an Explanation

Follow these steps to plan an explanation on the topic 'How Does an Aeroplane Fly?' Use the writing frames to help you.

(A) Make notes:

1) What do I already know about the topic?

My ideas

2) Research the topic. Discuss it and brainstorm in class.

Class research

(B) Use the headings in this plan to organise your thoughts and write information in each section of the explanation frame.

Title: I am going to explain how an aeroplane flies.

Definition: What is an aeroplane?

Cause and effect: The **how**, **why**, **where** and **when** of engine-powered flight...

What else do I know? Any other interesting facts?

Revise and check this first draft. Write the final draft in your copy or on your computer. Use drawings and/or diagrams to help you.