Michael Faraday

Humble beginnings

Michael Faraday (1791-1867) was an English scientist who studied electromagnetism and electrochemistry and was completely self-taught.

He was born in London at the start of the Industrial Revolution. His family was poor so he was unable to have a formal education, he only learnt how to read and write by attending Sunday school. To help his family he started working as an apprentice to a bookbinder: his work consisted of making and repairing the covers of books. This gave him the opportunity to read the books he worked with: he discovered he had a particular interest in science, an interest that increased when a customer gave him the tickets to attend some of Humphry Davy's lectures• at the Royal Institution.

A source of inspiration for young Faraday

Faraday was so captivated by Davy's experiments that he wrote to him expressing his desire to engage in research work. At first, Davy turned him down; later on, Davy offered him the opportunity to become one of his laboratory assistants. Humphry Davy contributed to Faraday's scientific education and introduced him to famous scientists in Europe, including André-Marie Ampère and Alessandro Volta. When Davy retired, Faraday replaced him as Professor of Chemistry at the Royal Institution.

Sir Humphry Davy was an English chemist who discovered several chemical elements and compounds and invented the miner's safety lamp.

Crucial discoveries

Although Faraday worked in chemistry (he also discovered benzene), his greatest discoveries involved electricity, which was what he was really interested in.

Starting from some of the unsuccessful experiments that his colleagues at the Royal Institution had engaged in, he found out that moving a magnet through a loop of wire would electrify the wire and that the current also flowed if the loop was moved over a stationary magnet. He had succeeded in producing mechanical motion by means of a permanent magnet and an electric current, a discovery that led to the invention of the electric motor. Some years later Faraday found out that if a current passes through one coil, a momentary current was induced in the other coil: the basic principle of electromagnetic induction, which paved the way for the invention of transformers and the first dynamo, known as the Faraday disc, which was a forerunner of today's electrical generator. In the following years Faraday further experimented with electricity, finding the first evidence that light and electromagnetism are related (the so-called "Faraday effect") and inventing the "Faraday cage", a device that blocked electric waves.

His contribution to the technological advancements of our world is undeniable and he had such an influence on the following generation of scientists to be partly responsible for coining many familiar words including 'electrode', 'cathode' and 'ion'.

Adapted from https://www.aaas.org/genius-michael-faraday

bookbinder: *rilegatore*
captivated: *attratto, affascinato*
to engage in: *impegnarsi in (qs)*
evidence: *prova*
forerunner: *precursore*
lecture: *conferenza, lezione*
to pave the way: *aprire la strada*
self-taught: *autodidatta*
undeniable: *indubbio, innegabile*

1 Read the text and decide whether the statements are true or false. Correct the false ones.

	T	F
1. Faraday came from a wealthy family.	☐	☐
2. He learnt to read and write on his own and at Sunday school.	☐	☐
3. In his job he had to bind and fix book covers	☐	☐
4. He deeply admired Humphry Davy.	☐	☐
5. Faraday succeeded in doing what others had failed to do.	☐	☐
6. According to Faraday, there was no relationship between light and electromagnetism.	☐	☐

2 Write a summary of Faraday's biography. Your text must include the phrases below.

- Poor family
- Church school
- Apprentice to a bookbinder
- Passion for science
- Lab assistant
- Electromagnetic induction

3 The words in italics are in the wrong sentence. Put each word in the correct sentence.

The Faraday Flashlight

1. The Faraday flashlight is a recent *batteries* based on his work. .....

2. A *capacitor* is meant for emergency situations. .....

3. It doesn't use *electricity*, so it can be unreliable. .....

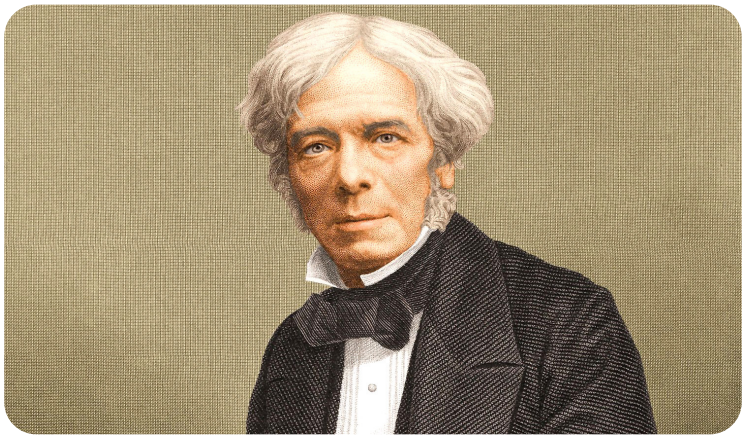
4. When the flashlight is shaken, a *flashlight* goes back and forth through a coil of wire. .....

5. This creates an electrical current that is stored in a *magnet*. .....

6. The *invention* which is generated lights the bulb. .....

4 Can you remember who these scientists are? Ask and answer questions with a partner.

- Nikola Tesla
- Benjamin Franklyn
- Luigi Galvani
- T. Alva Edison
- Alessandro Volta



M. Faraday