

A4 ACTIVITY 1: FARADAY'S EUREKA MOMENT

Background

In 1831 **Michael Faraday** discovered that moving a magnet in and out of a coil of wire produced what he called a **wave of electricity**. He found that this **wave of electricity** only occurred as the magnet was moving in and out of the coil. This was a new discovery – electricity without the need for a battery!

Faraday had discovered the principle of **electromagnetic induction**, which is still the basis for generating electricity. The aim of this activity is for the students to replicate Faraday's original experiment in order to appreciate how ocean and tidal movements are used to generate energy.

Equipment required:

- Strong neodymium magnet
- Solenoid of at least 1,000 turns
- LED
- Crocodile clips and leads

What to do:

1. Connect the LED across the solenoid.
2. Quickly bring the neodymium towards the solenoid as shown.
3. Ask the class what they noticed about the LED.
4. Let the neodymium quickly slip through the solenoid and take note of the appearance of the LED.
5. Ask the class to identify when the LED lights up and what they conclude from their answer.

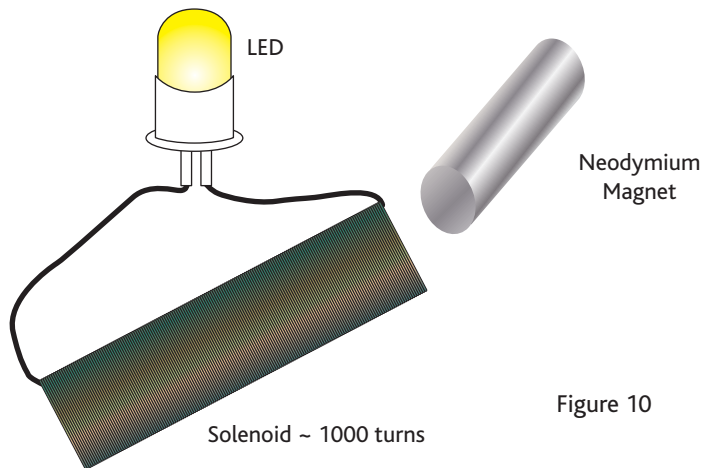


Figure 10

ALTERNATIVE ACTIVITY

Equipment required:

- Strong bar magnet or barrel neodymium magnet
 - Galvanometer (an instrument that detects electric current)
 - Insulated copper wire
 - Cardboard tube
 - Crocodile clips plus leads
 - Sandpaper
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What to do:

1. Wrap the wire around the cardboard tube to form a solenoid.
2. Scrape both ends of the wire clear using sandpaper.
3. Connect the solenoid to the galvanometer.
4. Quickly bring the magnet towards one end of the solenoid and observe the galvanometer.
5. Withdraw the magnet and observe the deflection of the galvanometer's needle.

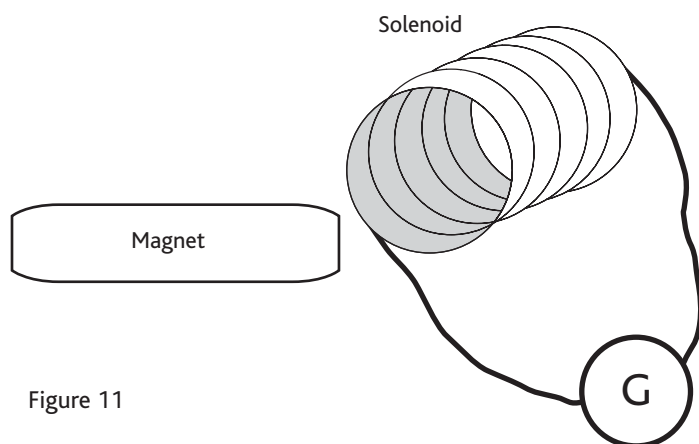


Figure 11

In your own words write a brief summary of the activity and explain why it is considered to be one of the most important experiments ever carried out.