

MAGNETISM AND ELECTRICITY

Magnetism and electricity are two fundamental aspects of electromagnetism, a branch of physics that explores their relationship. Electricity is defined as the flow of electric charge, typically measured in amperes, and can be generated from various sources, both renewable and non-renewable. Magnetism, on the other hand, refers to the force exerted by magnets when they attract or repel objects, a phenomenon caused by the motion of electric charges.

Experiment 1 - Magnetic Field Mapping

Materials

- Magnet
- Iron filings
- Thick paper or cardboard

Step-by-Step Instructions

1. Place a magnet on a flat surface.
2. Sprinkle iron filings around it and tap gently to see the magnetic field lines.



Concept Explanation

Magnets create invisible fields that attract or repel objects. The filings align along the magnetic field.



Reflection Questions

1. Where are the magnetic forces strongest? Think of the points at which iron filings are the most or the least.
2. Can you see patterns in the field lines?

Fun Facts & Extensions

Earth behaves like a giant magnet due to its magnetic field, which is primarily generated by the motion of molten iron and nickel in its outer core.

Real Life Examples

Magnets in Motors: Electric motors in fans, washing machines, and vehicles use magnets to convert electrical energy into mechanical energy.



MAGNET ON MOTORS

Magnetic Storage Devices: Hard drives and magnetic tapes store digital data using tiny magnetic particles.

Magnetic Levitation (Maglev): High-speed trains use magnets to float above the tracks, reducing friction and allowing faster travel.



MAGLEV TRAINS

Medical Imaging (MRI): Magnetic Resonance Imaging (MRI) uses strong magnets to create detailed images of the inside of the body.



MRI SCAN MACHINE



Igniting Curiosity, One Experiment at a Time



Scan this barcode on your phone to access the YouTube Video explaining Magnetic Field. Please subscribe to my channel

Experiment 2 - Simple Circuit

Materials

- Aluminium foil
- Battery
- Small light bulb

Step-by-Step Instructions

1. Use aluminum foil/copper wire to connect a battery to a small light bulb.
2. Ensure the circuit is complete to light up the bulb.



Concept Explanation

A circuit is a closed path for electricity to flow. The battery provides energy to power the bulb. Electricity is provided by the battery's chemical energy which lights the bulb and travels back to the battery to complete the circuit.



Reflection Questions

1. What happens if the circuit is incomplete? Will the bulb still light up?
2. Why does the bulb light up? What is the source of its light?

Fun Facts & Extensions

Circuits are the basis of all electronic devices. Phones, TV's and laptops all contain circuits that make them work as they all run on electricity

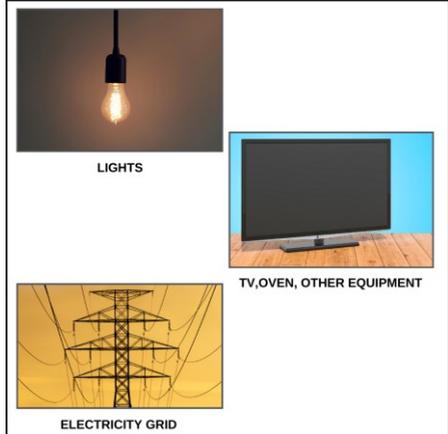
Real Life Applications of Circuits

Lighting: Electric circuits in homes and streets power lights, improving visibility and safety.

Electronics: Phones, laptops, TVs, and gaming consoles use complex circuits to function.

Energy Distribution: Power grids transport electricity from power plants to homes and businesses using circuits.

Security Systems: Alarm systems and CCTV cameras use electric circuits for surveillance and safety



Scan this barcode on your phone to access the YouTube Video explaining a Simple Circuit. Please subscribe to my channel

Igniting Curiosity, One Experiment at a Time

Experiment 3 - Static Electricity with a Balloon

Materials

- A balloon
- Small bits of paper

Step-by-Step Instructions

1. Inflate the balloon and rub it on your hair or a wool sweater to charge it.
2. Bring the balloon near the small paper pieces and observe them being attracted to the balloon.



Explanation

Rubbing the balloon transfers electrons to it, creating a static charge. The charged balloon attracts the neutral paper pieces through electrostatic forces.



Reflection Questions

1. How does the distance between the charged balloon and the paper pieces affect the strength of the attraction? What does this tell you about electric forces?
2. What would happen if you used different materials to rub the balloon, such as silk or plastic? How would it affect the charge?

Fun Facts & Extensions

Did you know that static electricity is not just a fun party trick? It plays a significant role in nature! For instance, lightning is a powerful discharge of static electricity that occurs when electrical charges build up in clouds and are released to the ground!

Real Life Examples of Static Electricity

Clothes in a Dryer: Clothes rubbing against each other in a dryer can create static, making them cling together.

Combing Hair: Combing dry hair can cause it to stand up due to static charges.

Walking on Carpet: Rubbing your feet on a carpet builds up static electricity, which you might feel as a shock when touching a doorknob.



Scan this barcode on your phone to access the YouTube Video explaining Lever Experiment. Please subscribe to my channel