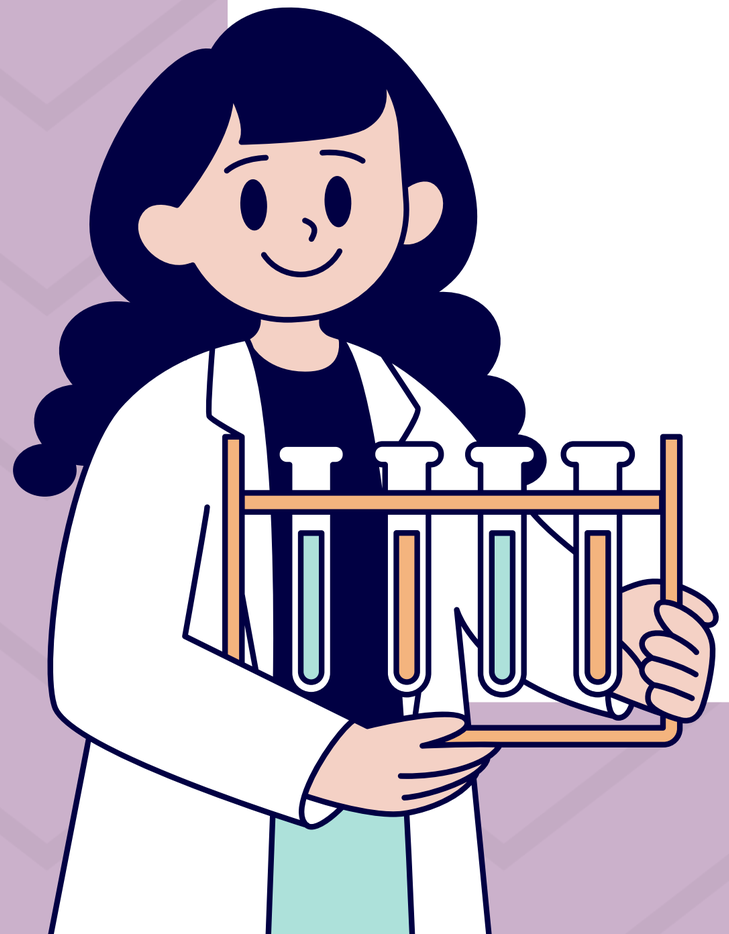
EXPLORING THE MAGNETIC FIELD OF A COIL



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MAGNETISM

Magnetism refers to the ability of certain materials to attract iron. A piece of material that is endowed with magnetism is called a magnet or magnet;

we can distinguish:

- Natural magnets
- Artificial magnets

BASIC CONCEPTS

FERROMAGNETICS

Magnetism is determined by a metallic substance discovered in antiquity called magnetite: certain materials, in contact with it, become magnetised acquiring the properties of magnetite and are called ferromagnetic. Through the use of these ferromagnetics, it is possible to construct magnets or magnets that have the function of magnetising other ferromagnetics. The most famous instrument that has to do with magnetism is the compass, which consists of a compass rose and a magnetic needle.

FORCES

In fact, magnets interact with each other with two types of force:

- Attractive force between two opposite poles
- Repulsive force between two equal poles

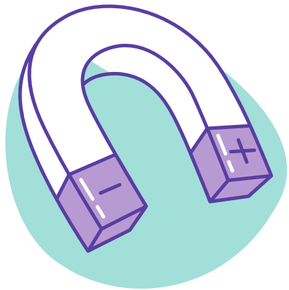
COMPASS

But there is an important difference between electric charges and magnetic poles: whereas electric charges can exist in isolation, so that positive and negative charges can be separated, in magnets this is impossible. In fact, they always have both a north and a south pole, because if you split a magnet into two parts and try to 'separate' the two poles, you get two completely similar magnets (each creating the 'missing' pole).

MAGNETIC FIELD

Magnetic interaction is described using the concept of a magnetic field: it is defined as a part of space that is affected by magnetic forces, or as the space surrounding a magnet. The magnetic field is represented by closed lines of force, which are tangent point by point to the magnetic field, and start at the north pole and end at the south pole of the magnet. The magnetic field is a vector field: its direction and direction are those in which a magnetic needle placed in the field is arranged, the direction being that indicated by the north pole.

MAGNETISM EXPLAINED BY DR. BINOCS SHOW



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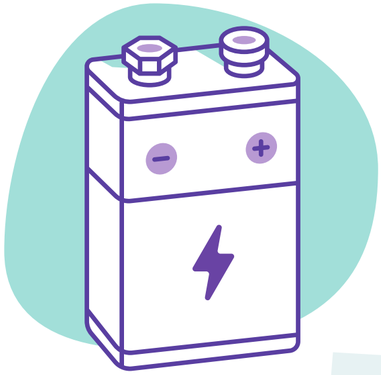
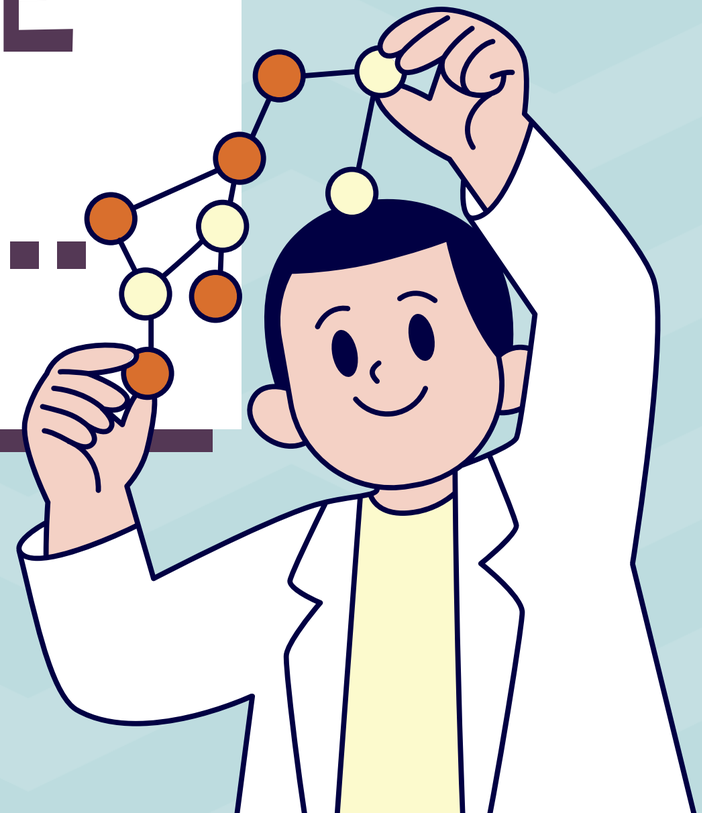
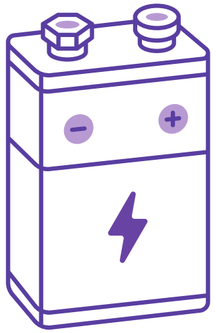


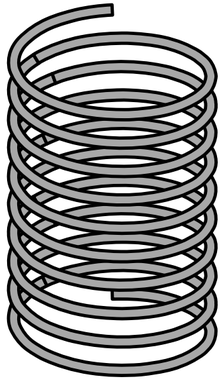
AND NOW THE EXPERIMENT...



MATERIALS USED

- 2 compasses
- battery
- coil
- 3 connecting cords

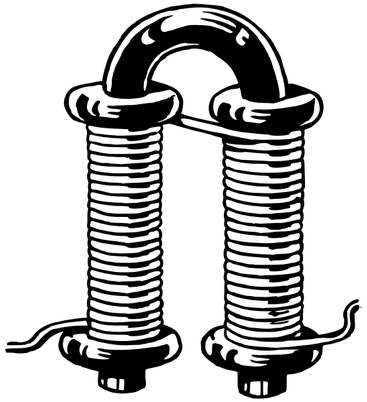




TARGETS

1. understand the behaviour of the magnetic field of a coil

2. discover the effect of an iron core



1.take the coil, the battery and the two compasses

2. Fit the coil and compasses before connecting the battery.

3. Choose the orientation so that the compasses point in a direction orthogonal to the axis of the coil,

4. Connect the battery and observe the behaviour of the compass needles.

5. Now move the compasses away from the coil along the line of the coil axis.

6.Observe any changes in the direction of the needles.

7. Finally Disconnect the battery

the opposite ends of the needle point to the coil at the opposite ends of the coil. the direction of the field is the same at each end of the coil. By moving the compasses away from the coil, the needles rotate towards the direction they were when there was no current. the coil field becomes weaker as it moves away from the coil.

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the opposite ends of the needle point to the coil at the opposite ends of the coil. The direction of the field is the same at each end of the coil. By moving the compasses away from the coil, the needles rotate towards the direction they were when there was no current. The coil field becomes weaker as it moves away from the coil.

1. Insert the wire into a coil and position the coil, battery and two sockets

2. Place the coil and compasses before connecting the battery.

3. Choose the orientation so that, in the absence of current, the compasses point in a direction perpendicular to the axis of the coil

4. Connect the battery and observe the behaviour of the compass needles.

5. Now move the compass away from the coil along the line of the coil axis.

6. Observe any changes in the direction of the needles.

7. Compare the behaviour of the needles in this experiment with the behaviour they had if there was no iron core in the coil.

8. Disconnect the battery

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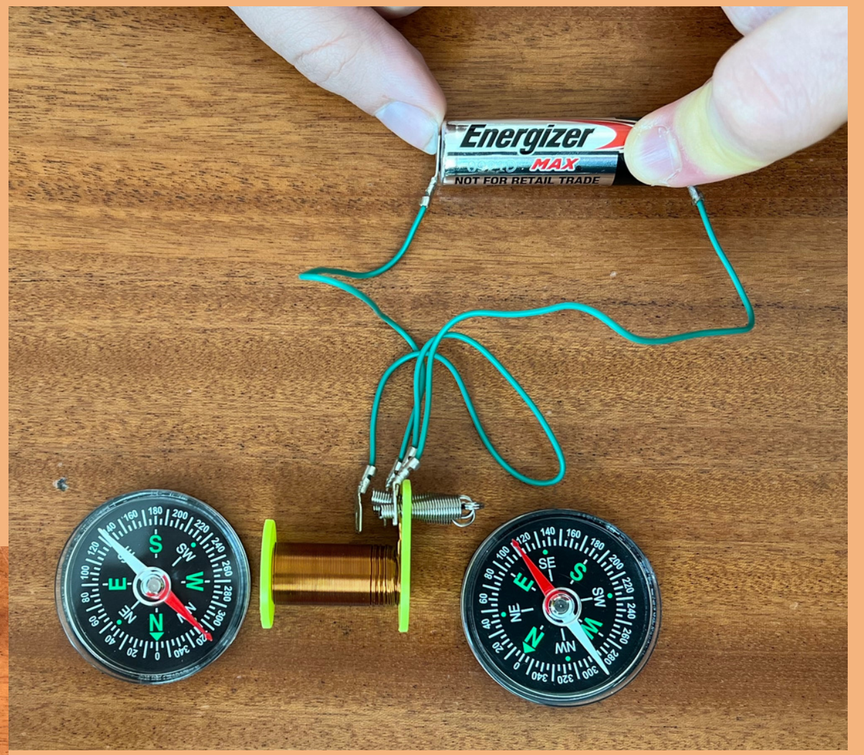
AA
Energizer


Energizer
MAX
NOT FOR RETAIL TRADE