

Electricity and Magnets

Is there a link between the two?

Electricity and Magnets

Magnetism: the force around a magnet

The attraction or repulsion of poles are examples of **magnetic force**.

Hans Christian Oersted's Experiment

In the experiment he passed electric current through a wire, which caused a nearby magnetic compass needle to move.

What was the point? What did this experiment discover?

Back in the early 1800's, we knew very little about electricity and its relationship with other concepts. We knew lightning was a form of electricity and that if lightning struck a ship, the ship's compass would malfunction. This suggested that there was a link between electricity and magnetism.

Oersted's experiment showed that an electric current (the current in a wire attached to a battery) has a magnetic field around it.

What do you think the difference between a permanent magnet and a temporary magnet is?

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Permanent magnets stay magnetized for long periods of time.

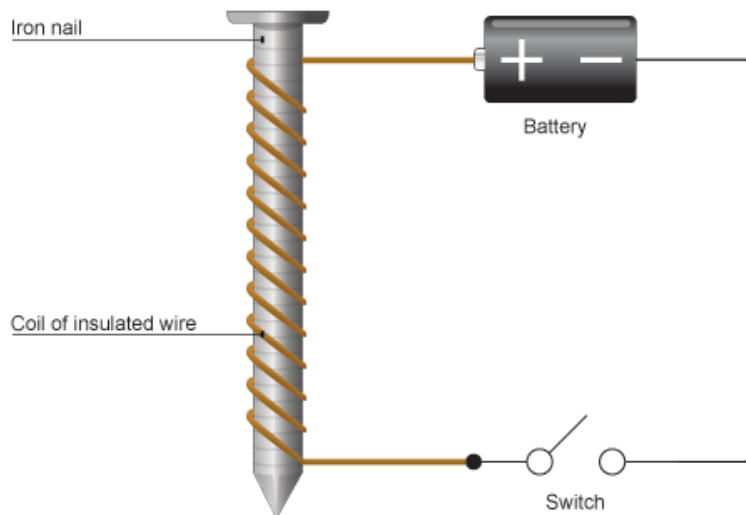
The magnets on your fridge are permanent magnets.

Temporary magnets can turn their magnetism on and off. **Electromagnets** are temporary magnets that only act as magnets if an electric current is flowing through them.

Doorbells work because of electromagnets. When you push a doorbell, you're completing a circuit. (Like closing a switch so the current can flow through.) The current creates a magnetic field and the magnets cause the noise.

If we did not use temporary magnets for doorbells, the sound would continue indefinitely.

Electromagnets



The more coils (number of times you wrap the wire around the nail) the larger the magnetic field strength.

If you were trying to pick up staples with a nail, a battery, and wire, to pick up the most staples should you wrap the wire around more or less times?

We can use electromagnets for much more than picking up staples.



Electromagnets are not only used to pick up and move things. They can also be used to create movement.

Who is Michael Faraday?

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He invented the electric motor!

What are some objects that use a motor?

How have these items made your life easier?

Think about one of the items and the job it does for you. How would you accomplish the job if the object didn't have a motor?

How would your life be different if motors had never been invented?

Applying Our Knowledge of Electricity

Answer the following questions scientifically.

1. Why should you not use electrical equipment around water?
2. If lightning strikes, what locations put you at higher risk of getting struck?
3. Why should you not stick a fork into an electrical outlet?

Electricity and Magnetism