Curiosity Guide #804
Electric Motors
Accompanies Curious Crew, Season 8, Episode 4 (#804)

Electromagnetic Power
Investigation #4

Description
Motors have magnets in them. Do this fun investigation to find out more about how magnets work.

Materials
• Large iron nail
• Wire
• 6-volt battery
• Alligator clips
• Paper clips
• Plate

Procedure
1) Wrap the shaft of the large nail with tightly coiled wire, leaving lengths of wire on both ends.
2) Connect the two wire ends with alligator clips.
3) Put some paper clips on the plate.
4) Predict what will happen if you place the nail on the paper clips.
5) Now connect the other ends of the alligator clips to the battery and touch the nail to the clips again.
6) What do you notice?
My Results

Explanation

This is an example of a simple electromagnet. At first the iron nail has no effect on the paper clips, but when it is connected to the power supply it becomes magnetized and attracts to the paper clips. When electricity flows in a wire it makes a magnetic field, and in this case magnetizes the iron nail. It is possible to make the magnet stronger with more wire coils allowing more current to flow. The direction the current flows will also establishes the direction of the magnetic field. The right-hand rule says when you hold your right hand with the thumb pointing in the direction of the current and you wrap your fingers around the wire, the tips of the fingers point in the direction of the magnetic field.

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