

Making an Electromagnet

There are so many activities you can do with a magnet. But what if you do not have a magnet? Here is an activity where you can magnetize an iron nail using some everyday materials. Have fun!

You Will Need

D-cell battery	tape	paper clips
potholder or oven mitt		rubber band
iron nail or bolt		insulated wire

What to Do

1. Cut a piece of wire about 2½ feet long. Use insulated copper wire. This is wire that is covered with plastic. At each end of the wire, strip away about 1 inch of the insulation. **Caution: Ask an adult to help you strip the wire.**

2. Wrap the wire around an iron nail or a bolt in a tight coil as shown in the photos. Use a nail about 3½ inches long.

3. Wrap a wide rubber band around each end (pole) of a D-cell battery. The rubber band should be tight. Tape it in place as shown in the photos.

4. Place the stripped ends of the wire under the rubber band at each pole as shown. Electricity will now flow from the battery, through the wire, and back to the battery. This is a complete circuit. **Caution: The stripped ends will get warm or hot. Use a mitt or potholder if you need to hold the wires against the poles.**

5. Bring either end of the nail to the paper clips. Are the paper clips attracted to the nail? How many paper clips can the electromagnet pick up?

How It Works

Whenever electricity flows through a wire, a magnetic field surrounds the wire. The nail now becomes magnetic and will pick up the paper clips. But unlike magnets, this electromagnet is a temporary magnet. If the wire is disconnected, will the nail still be magnetic? Can you make the electromagnet stronger? **Disconnect at least one wire when the electromagnet is not in use.**

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