

# DIY Electromagnets



## FUN FACT

The strength of magnets are measured in units of either tesla (T) or gauss (G). The tesla is used to measure very strong magnets. Weaker magnetic fields are measured in gauss. It takes 10,000 gauss to equal just 1 tesla! The strongest magnets in the world run at 45 teslas while Earth's magnetic field is only about 1/2 a gauss!

## MATERIALS

- Battery
- Wire
- Nail
- Paper clips
- Electrical tape

## DIFFICULTY



## MAGNETISM

Magnetic activities like this can be very attractive! Magnets can be found in nature and can also be created by using electricity. Electromagnets are devices that create a magnetic field through the application of electricity.

## VISIT

[DIYSCIENTIME.ORG](http://DIYSCIENTIME.ORG)  
FOR MORE SCIENCE FUN!



*What is a magnet's favorite sport?*

\*Answer on the next page

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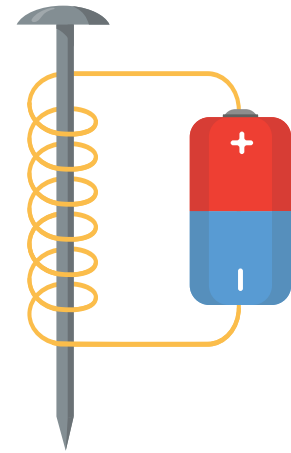
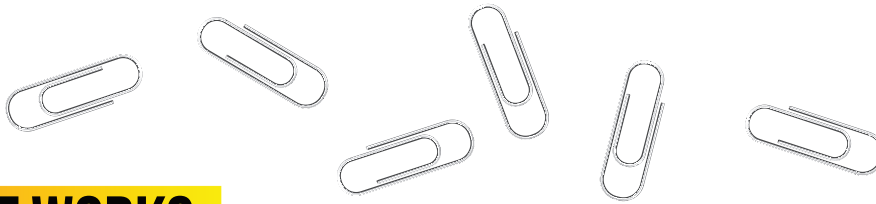
### EXPERIMENT

**Step 1:** Gather your materials.

**Step 2:** Coil your wire around the nail, leaving some extra wire on both ends.

**Step 3:** Attach the wire to the battery on both ends using electrical tape.

**Step 4:** Bring the nail close to the paperclips to test your electromagnet!



### WHY IT WORKS

During this activity you are creating an electromagnet. An electromagnet uses electricity to create a magnetic field. The magnetic field is created by the electric current running through the wire, and is concentrated around the inner coil of wire where the nail is located. The nail is now a temporary magnet that can pick up small pieces of metal.

### EXTEND YOUR LEARNING

- How could you make your electromagnet pick up more paper clips? Or bigger paper clips?
- Could you stack two batteries together?
- What would happen if you changed the type or size of nail you are using?
- Do different types of nails work?

### WORKFORCE CONNECTION

A radiologist is a doctor who performs and reads medical imaging such as ultrasounds, X-rays and MRIs to check for problems and diseases. MRIs (Magnetic Resonance imaging) are devices that take pictures of the inside of the body using electromagnets.