

World's Simplest Electric Motor

Electricity and magnetism combine to turn a screw.

WHAT TO DO

Place a small disk magnet on the head of a screw, then touch the pointed end of the screw to the post on the positive end of the battery so that the screw hangs below it. Press one end of a wire to the top (negative) end of the battery then gently touch the other end of the wire to the magnet and watch the magnet and screw begin to turn.

WHAT'S HAPPENING?

When you hold one end of a metal wire to the battery and touch the other end to the magnet an electric current flows from the battery through the wire. The circuit is completed because the magnet is coated with a conductive metal and connected to the metal screw which is touching the other end of the battery. The electric current flowing through the wire also creates a magnetic field around the wire, i.e. an electromagnet. As you probably know from playing with magnets, the magnetic field of one magnet will produce a force that can push or pull another nearby magnet.

In this case the magnetic field from the current in the wire near the surface of the magnet is strong enough to move the magnet and screw, and the direction of the force created is such that it causes the magnet and screw to turn. Because there is very little friction at the point of contact between the screw and battery it can spin very fast and should continue to spin long after the wire is disconnected.