**UN-TRUE NORTH**

You will experience a force of nature you cannot see when trying UN-TRUE NORTH.

**WHAT YOU WILL NEED:**
- Piece of thin, bare copper wire about 12 inches (30 cm) long
- 1 size-C battery
- Electrical tape
- Compass
- Small bar magnet

**SAFETY FIRST!**
If you are using a new battery, the copper wire and the battery can become very warm. Don’t hold the wire in direct contact with your skin for too long, and don’t keep both ends of the wire connected to the battery for more than a few minutes.

**DO THE DEED**
Here is a simple way to detect the magnetic field created by an electrical current.

1. Take the piece of wire and bend it into a U-shape, with the mouth of the U matching the length of the C battery.

2. Use a 2-inch (5 cm) piece of electrical tape to fasten one end of the copper wire firmly against the flat side (negative terminal) of the battery. Now tape the other end of the wire onto the small nub sticking out of the other side of the battery (positive terminal).

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Hold the compass and notice the position of the needle as it points north.

Hold the compass about 12 inches (30cm) above the wire, and then move the battery so the wire is parallel to the compass needle.

Gradually bring the compass close to the wire until it is almost touching. Watch the compass needle turn as it reacts to the magnetic field that surrounds the electrical current running through the wire.

Raise the compass again. Now turn the battery 180 degrees so that the ends are switched around. This will reverse the direction the current is flowing around the wire loop.

Lower the compass toward the wire through which the current is now flowing in the opposite direction from the first time you did this. When the compass needle turns this time, how is it turning differently from the way it turned in Step 5?

Untape the connection on one end of the battery and watch to see if the compass needle changes direction and points back toward the North Pole.

Take the small bar magnet in one hand and bring the compass down over it until they are almost touching. How does the compass needle react? Remember which way the North arrow is pointing.

Take the magnet away from the compass needle and turn the magnet 180 degrees so that the poles are switched around.

Bring the compass toward the magnet again and see which way the North arrow points this time.

A compass needle moves so, that it lines up with Earth’s magnetic field. If brought close to a magnetic field that is stronger in that location, the compass needle will turn and align with that magnetism.