OVERVIEW

In this experiment you explore how a magnetic field created with electrical current can mess with a compass! The current that flows through the coil from one end of your batteries to the other creates a magnetic field. If you remember from science class, the earth also has a magnetic field. The earth’s magnetic field is what makes compasses point north. However, since the magnetic field you create with your coil is so much closer than the earth’s field, it is stronger and forces the compass to point to it, instead of pointing to the north!

MATERIALS

• Bread Board
• Bowl of Water (glass or plastic)
• Bottle Cap
• Wire Cutters
• Wire Strippers
• 22 Gauge Insulated Solid Core Copper Wire
• 4 AA Batteries
• Battery Holder
• Magnet
• Paperclip
• Pencil

INSTRUCTIONS

1. Fill the bowl with water and place aside.
2. Wrap your wire around the pencil making 13 loops very close together.
3. Cut the wire and strip the insulation off both ends.
4. Magnetize the needle by stroking it against the magnet about 20 times.
5. If your needle can pick up a paper clip, it’s magnetized!
6. Place your needle in the bottle cap.
7. Put the cap on the surface of the water.
8. Put your ends of the coil in 2 separate rows of the breadboard.
9. Place the batteries in the battery holder.
10. Put the black wire of the battery holder in the same row as one of the legs of the coil.
11. When you are ready to turn on the coil, place the red wire in the same row as the other end of the coil.
12. Be careful, do not drop your batteries in the water!
13. Do not leave the red wire plugged in for more than 1 minute!