

## 2. MAKING RADIO WAVES

Purpose: To demonstrate a simple way of making radio waves, and to show their association with electric current and magnetic fields.

Materials: Battery powered radio, metal frying pan spatter cover (a sheet of aluminum foil or a bare metal cookie sheet will also work), metal strainer, and plastic strainer, compass, battery (any configuration up to six volts), wire to create a spark gap.

**CAUTION: DO NOT USE ANY PLUG-IN AC POWER SOURCE.**  
The excessive voltage or current from this type of power supply may cause electric shock or create a fire hazard. Use batteries of six volts or less.

Configuration and Operation: A battery powered AM radio must be used. If a power cord is used with the radio, the cord will pick up the radio signal and carry it through the shielding to the radio and will not allow the signal to be blocked.

Connect one end of the wire to a battery terminal and then briefly touch the other end to the other battery terminal. Observe the spark generated by this procedure. Place the compass under the wire, and create another spark. The compass needle will swing as electric current passes through the wire when it makes the spark.

Turn the radio on and tune it so it does not receive any station. Place the radio on the spatter cover. Make a spark with the battery. This will produce a burst of static in the radio, and the compass needle will swing.

Next, cover the radio with the metal strainer, making tight contact with the spatter cover. Make a spark with the battery and the compass needle will swing, indicating a radio wave is being generated, but the radio will not receive it (no static burst) because it is shielded by the metal strainer; that is, the radio waves are blocked.

Now remove the metal strainer and place the plastic strainer over the radio. The radio reception will be unaffected by the plastic strainer, demonstrating that not all materials will act as barriers to radio waves.

Text for the MAKING RADIO WAVES exhibit at the Science Discovery Museum:

### MAKING RADIO WAVES

Look through the magnifier while you touch the red probe to the nail inside the magnifier.

What do you notice?

What do you hear?

Watch the compass while you touch the nail.

What happens?

Can you protect the radio from the radio waves with the metal cage?

Sparks and lightning release electromagnetic energy that causes static on the radio.

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Look through the magnifier while you touch the red probe to the nail inside the magnifier.

- ▶ What do you notice?
- ▶ What do you hear?

Watch the compass while you touch the nail.

- ▶ What happens?

Can you protect the radio from the radio waves with the metal?

Sparks and lightning release electromagnetic energy that causes static on the radio.

Plastic Strainer

Metal Strainer

4 D Cell Batteries

Battery Powered Radio

Metal Spatter Cover

Magnifier

Sparker

Compass

Spark Key



