Speakers Materials List:

Several AM/FM radios with audio output or headphone jacks

> You will need to test several different radios to find one that works best for this activity (some radios have more powerful amplifiers than others).

Enough new magnets from a hardware or craft store so that you have three to six 2.5 cm diameter magnets for each student group

> Old magnets are often weakened through dropping and handling, while new magnets are at maximum strength.

From an electronics store, or other source, obtain several rolls of magnet wire

> One 75 ft roll of 26-gauge and one 200 ft roll of 30-gauge wire will do for one class of around 24 students.

A pair of small wire cutters

A headphone cable

> The headphone cable can be purchased with the center (innermost) and shield (outside) leads (the inside wires) separated and exposed on one end. Ask for an audio cable with a 1/8 inch plug to "tinned" wires. Or, you can prepare your own cable from an audio cable with plugs at both ends. Do this by cutting off one plug and gently cutting off and removing a few centimeters of the plastic cable covering to expose the mesh-like shield lead. Twist the mesh of the shield lead to make it into a wire shape. Next, carefully cut off and remove a few centimeters of the center insulation (a clear plastic) underneath the shield lead to expose the center lead. Now you have a cable with a plug at one end and two exposed leads at the other. These exposed leads will be connected to the ends of the coils in the pie pan speaker.

At least one empty coffee can, a pie pan, and various other metal or plastic containers for each student group

Masking tape

A compass

A round container or cardboard tube (such as those from empty paper towel rolls)

Cardboard boxes of various sizes (but larger than a coffee can or pie pan)

One or two pieces of fine-grade sandpaper for each group

Simple science journals in which students can describe the investigation, include new vocabulary words, make drawings to illustrate the apparatus built, and record their observation, inferences, and conclusions.