

1. WAVE BARRIER

Purpose: To demonstrate how an object can be shielded from electromagnetic radiation, e.g. radio waves.

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.

Configuration and Operation: A battery powered 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.

Turn the radio on, place the radio on the spatter cover, and cover it with the metal strainer, making tight contact with the spatter cover. The radio reception will either turn to static or stop completely. This demonstrates that metal screening creates a barrier, or shield, for radio waves. This acts as a Faraday Cage and prevents electromagnetic radio waves from passing through.

Next, 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 WAVE BARRIER exhibit at the Science Discovery Museum:

WAVE BARRIER

Listen to the radio. Place the metal strainer over the radio and press it to the metal mesh.

What do you notice?

What happens if there is a gap between the strainer and the mesh?

Place the plastic strainer over the radio.

What do you notice?

Try this at home with a portable radio, tinfoil, and a metal strainer.

Fine metal mesh and foil can stop radio waves.

WAVE BARRIER

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- What do you notice?
- What happens if there is a gap between the strainer and the mesh?

Place the plastic strainer over the radio.

- What do you notice?

Try this at home with a portable radio, tinfoil, and a metal strainer.

Fine metal mesh can stop electromagnetic radio waves.

Plastic Strainer



Metal Strainer



Battery
Powered Radio



Metal Spatter
Cover

