

Electricity and Magnets

First /Last Name: _____

1. Magnets can be either naturally occurring or man-made. What are the 3 naturally occurring magnetic metals?

Electromagnetic elements: Iron, Cobalt and Nickel

2. If I am making a man-made magnet, what must it be made out of?

One of the above elements or a combination of them could be magnetize with current

- a. If a magnet is cut into 2 parts, each piece will still have:

Its own south and north pole

3. What do electric currents produce?

It produces an electromagnetic field

4. What is an electromagnet?

An electron carrying-wire

5. What are 4 things that you can do to increase the strength of an electromagnet? Explain why each one will increase the strength:

1. Increase the number of loops
2. Decrease the temperature
3. Increase the surface area of the wire (thickness)
4. Increase the current/voltage

6. Explain 2 reasons why an electromagnet is so useful:

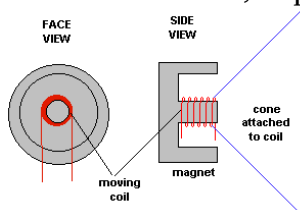
It can be turn off/on

The strength is controllable

7. How does an electric current produce a magnetic field?

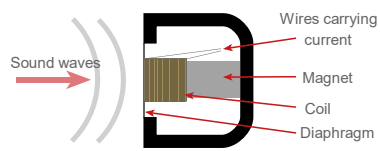
Electrons moving in one direction within a conductor creates the magnetic field

8. In a few sentences, explain how a speaker works



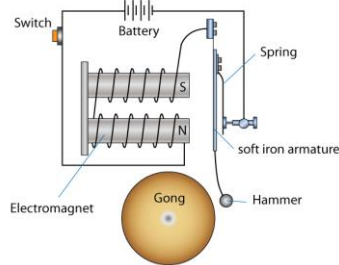
1. Varying current through the coil in combination with a permanent magnet produces a force (max when perpendicular to current and magnetic force).
2. This force makes the cone/membrane vibrate
3. Vibration produces sound

9. In a few sentences, explain how a microphone works



1. Sound vibrates a membrane attached to a coil around a magnet.
2. The moving coil generates a changing current

10. In a few sentences, explain how an average ring bell works



1. When the switch is on, current flows through the coils magnetizing the aluminum (Al) cylinders.
2. Al cylinders attract the hammer and the bell rings at the same time the circuit breaks
3. When the circuits breaks, the hammer returns to its original positions and current flows again, and a new cycle starts.