

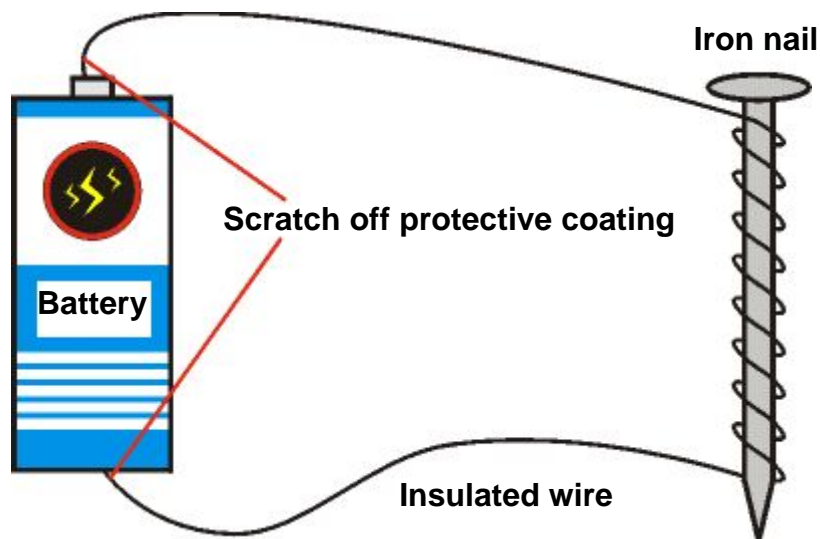
Worksheet (1)

The Characteristics of an Electromagnet

When a conducting (insulated) wire is coiled around a piece of soft iron, and electric current is passed through the coil, the soft metal then becomes magnetic. This installation is called an electromagnet. Unlike a permanent magnet, the magnetic strength of an electromagnet is temporary and will vanish when the electric current is cut off. If the piece of soft iron is replaced by an iron nail, the magnetic strength may last for several seconds to several minutes after the electric current stops, depending on the composition of the iron nail.

1. How to make a simple electromagnet?

- a. Coil a piece of insulated wire around an iron nail 40 times. Scratch off the protective coating on both ends of the wire with sandpaper.
- b. Connect the ends of the wire to the positive and negative poles of a battery to create the electromagnet.



- c. Please design two simple experiments to show that the electromagnet has the characteristics of a permanent magnet.

2. What factors may affect the magnetic strength of an electromagnet?
- a. Assume there are factors that may change the magnetic strength of an electromagnet.

- b. How can you test whether your assumptions are correct?
