

12.2 Oersted's Discovery (Right Hand Rule #1)

1819 – Danish scientist named Han Christian Oersted linked electricity to magnetism. He discovered that current running through a straight wire made a compass move in a predictable way.

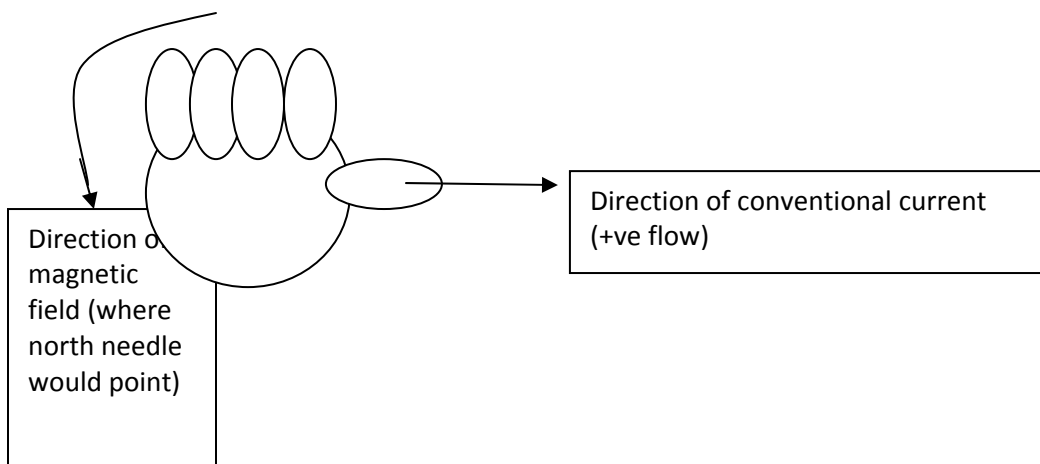
Oersted's Principle: whenever a charge moves through a straight conductor, a circular magnetic field is created around the conductor.

Please refer to the text pg. 553 for some good illustrations.

Conventional Current = positive flow.

Now we know that electrons move in a conductor but back in Oersted's day, the assumed something positive was flowing. So, any memory tricks or rules involves 'positive flow' or conventional flow. This is opposite in direction to electron flow. (Thank Benjamin Franklin for this!)

RHR #1 - Right Hand Rule #1 (RHR #1) is a way of remembering how current creates a circular magnetic field. **YOU MUST USE YOUR RIGHT HAND!!!!**



That is my attempt at drawing Right Hand Rule #1 (RHR #1) with a computer !

Drawing Conventions

- 1) Conventional current will be show unless otherwise stated.
- 2) If just a battery is show, remember that the long line is the positive side and the short line is the negative side. Positive flow goes from positive end to negative end.
- 3) X → means current going INTO page
● → means current coming OUT of page
- 4) the closer together the magnetic lines, the stronger the magnetic field.

Why is this so amazing?

- 1) One can turn a magnet ON and OFF merely by turning electricity on and off!
- 2) One can increase the strength of the magnetic field by increasing the current.
- 3) One can switch the direction of the magnetic field by switching the direction of the current.