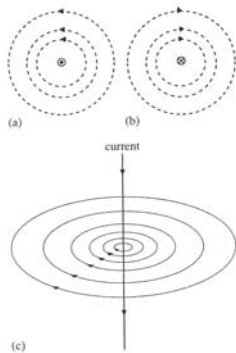


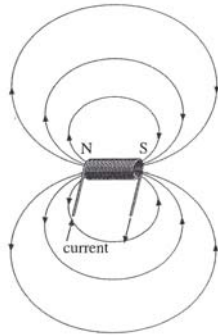
Electromagnetism

- A moving charge generates a magnetic field

Straight Wire

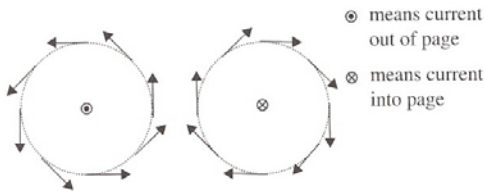


Solenoid (Coil)



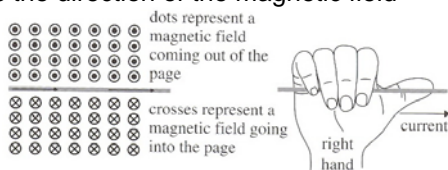
Direction of Magnetic Fields

- The direction of the magnetic field at a given point in space is found by placing magnetic needles around the wire and seeing they align themselves

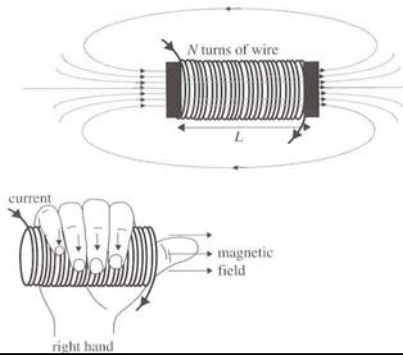


“Right-hand Rule”

- Grip the wire with the fingers of the right hand in such a way that the thumb points in the direction of the current
- Then the direction in which the fingers curl is the direction of the magnetic field



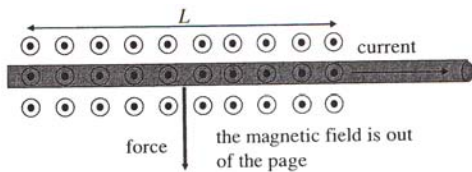
The Solenoid



- The magnetic field inside of a solenoid increases as we add more loops
- The field inside is constant and is directed straight through the middle of the solenoid
- The field of a solenoid can be intensified by placing an iron core inside the solenoid

Magnetic Force on Current

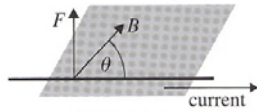
- If a current is placed in a region of magnetic field, it will experience a magnetic force.



- The magnitude of the force is proportional to the current, I , the magnetic field magnitude, B , and the length L of the wire that is in the magnetic field.

$$F = BIL \sin \theta$$

θ is the angle between the current and the direction of the magnetic field



Direction of Magnetic Force On a Wire

- Using the right hand, place the thumb in the direction of the current and the fingers in the direction of the magnetic field.
- The direction away from the palm is the direction of the magnetic force.

