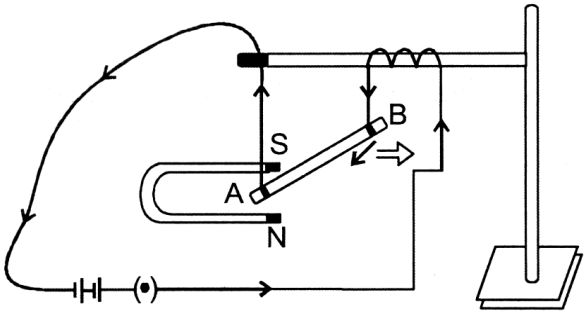
MAGNETIC EFFECT OF ELECTRIC CURRENT
Fleming Law

Force on a Current-Carrying Conductor in a Magnetic Field:

Immediately after Oersted's discovery of electric currents producing magnetic fields and exerting forces on magnets, Ampere suggested that magnet must also exert equal and opposite force on a current-carrying conductor. When a current carrying conductor is kept in a magnetic field (not parallel to it), a force act on it. This force is created due to the interaction of magnetic field of the current in the conductor and the external magnetic field on the conductor. As a result of this superposition, the resultant magnetic field on one side of conductor is weaker than on the other side. hence the conductor experiences a resultant force in one direction.
Take a small aluminum rod AB. Suspend it horizontally by means of two connecting wires from a stand. Now, place a strong horseshoe magnet in such a way that the rod is between the two poles with the field directed upwards. If a current is now passed in the road from B to A, we will observe that the rod gets displaced. This displacement is caused by the force acting on the current-carrying rod. The magnet exerts a force on the rod directed towards the right, with the result the rod will get deflected to the right. If we reverse the current or interchange the poles of the magnet, the deflection of the rod will reverse, indicating thereby that the direction of the force acting on it gets reversed. This shows that there is a relationship among the directions of the current, the field and the motion of the conductor.

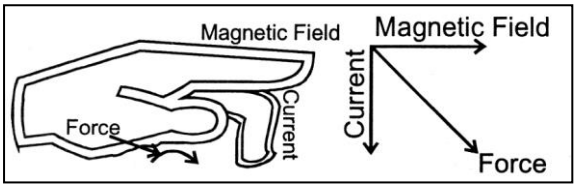


Direction of Force on Current Carrying Conductor:

The direction of force obtained by the Fleming's left-hand rule.

Fleming left hand rule:

Stretch the forefinger, middle finger and the thumb of you left hand mutually perpendicular to each other as shown in figure. It the forefinger indicates the direction of the magnetic field and the middle finger indicates the direction of current, then the thumb will indicate the direction of motion (i.e., force) on the conductor.



FLEMING'S RIGHT-HAND RULE:

Stretch the thumb, middle finger and the forefinger of your right hand mutually perpendicular to each other as shown in figure. If the forefinger indicated the direction of the magnetic field and the thumb indicated the direction of motion of the conductor, the middle finger will indicate the direction of induced current