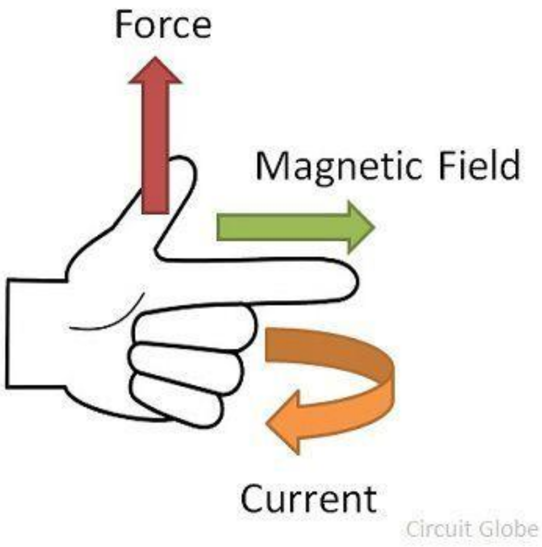
Working Principle of a DC Motor

The DC motor is the device which converts the direct current into the mechanical work. It works on the principle of Lorentz Law, which states that **“***the current-carrying conductor placed in a magnetic and electric field experience a force***”.** The experienced force is called the Lorentz force. The Flemming left-hand rule gives the direction of the force.

Fleming Left Hand Rule

If the thumb, middle finger and the index finger of the left hand are displaced from each other by an angle of 90°, the middle finger represents the direction of the magnetic field. The index finger represents the direction of the current, and the thumb shows the direction of forces acting on the conductor.



The formula calculates the magnitude of the force,

$$F = BIl \quad \text{newton}$$

Before understanding the working of DC motor, first, we have to know about its construction. The armature and stator are the two main parts of the DC motor. The armature is the rotating part, and the stator is their stationary part. The armature coil is connected to the DC supply.

The armature coil consists the commutators and brushes. The commutators convert the AC induced in the armature into DC and the brushes transfer the current from rotating part of the motor to the stationary external load. The armature is placed between the north and South Pole of the permanent or electromagnet.

Video Link: https://www.youtube.com/watch?v=j_F4limaHYI