**DC MOTOR**

A **DC motor** is an [electric motor](http://en.wikipedia.org/wiki/Electric_motor) that runs on [direct current](http://en.wikipedia.org/wiki/Direct_current) (DC) electricity.DC motors are fairly simple to understand.  They are also simple to make only require a battery or dc supply to make them run.

## An electric motor is a machine which converts electrical energy into mechanical energy.

**Principle:**

    It is based on the principle that when a current-carrying conductor is placed in a magnetic field, it experiences a mechanical force whose direction is given by [Fleming's Left-hand rule](http://www.ncert.nic.in/html/learning_basket/electricity/electricity/machine/instructions_for_motor.htm#lhr) and whose magnitude is given by

                  Force, **F = B I l** Newton

                  Where B is the magnetic field in Weber/m2.

                   I is the current in amperes and

                     l is the length of the coil in meter.

The force, current and the magnetic field are all in different directions.

    If an Electric current flows through two copper wires that are between the poles of a magnet, an upward force will move one wire up and a downward force will move the other wire down.

|  |  |
| --- | --- |
| http://www.ncert.nic.in/html/learning_basket/electricity/images/machines/motor.3.jpg | http://www.ncert.nic.in/html/learning_basket/electricity/images/machines/motor.2.jpg |
| **Figure 1: Force in DC Motor** | **Figure 2 : Magnetic Field in DC Motor** |
| http://www.ncert.nic.in/html/learning_basket/electricity/images/machines/motor.1.jpg | http://www.ncert.nic.in/html/learning_basket/electricity/images/machines/motor.2.jpg |
| **Figure 3 :  Torque in DC Motor** | **Figure 4 : Current Flow in DC Motor** |

    The loop can be made to spin by fixing a half circle of copper which is known as [commutator](http://www.ncert.nic.in/html/learning_basket/electricity/electricity/machine/instructions_for_motor.htm#brush), to each end of the loop. Current is passed into and out of the loop by brushes that press onto the strips. The [brushes](http://www.ncert.nic.in/html/learning_basket/electricity/electricity/machine/instructions_for_motor.htm#brush) do not go round so the wire do not get twisted.  This arrangement also makes sure that the current always passes down on the right and back on the left so that the rotation continues. This is how a simple Electric motor is made.