d.c. Machines
Principle Of Operation Of A d.c. Machine

- All motors and generators make use of two basic principles:
  - When two poles of a magnet are brought close together then there will be either a repulsion force or an attraction force.
  - When current flows in a conductor, a magnetic field is created around that conductor.
Magnetic Fields
Magnetic Fields
Current Flowing in Conductor
Current Flowing in Conductor
Magnetic Field in a Coil

- When a current is passed through a coil a magnetic field is generated
Armature

- The armature windings start and finish at a point on the armature called the commutator.
Brushes

- The final part of the machine is the brushes.
- The brushes on a d.c. machine are made up of carbon. Carbon has a number of qualities that make it ideal for this purpose:
  - It is very soft;
  - It is a conductor;
  - It self-lubricates.
Brushes

- The brushes provide one of two functions:
  - For a d.c. generator the brushes act to tap the supply off the armature. The brushes act as conductors and lubricators.
  - For a d.c. motor the brushes act to deliver current to the armature, where again the brushes act as a conductor and lubricator.
Commutation

- A commutator is made up of a series of segments which are conductors separated by thin pieces of an insulator such as mica.
d.c. Generator