

Uses of Electromagnetism

Uses of EM

Objectives

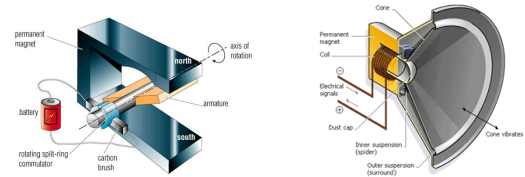
List and explain some uses of electromagnetism.

Calculate the torque produced by the magnetic force on a motor.



Uses of Electromagnetism

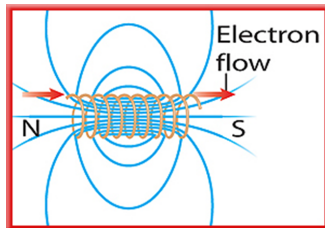
Electric motors, generators, electromagnetic switches - automobile starters and gauges, signaling devices for bells and buzzers, MRI's, Maglev trains, electric meters, etc.



Solenoids

A single wire wrapped into a cylindrical wire coil is called a **solenoid**.

The magnetic field inside a solenoid is stronger than the field in a single loop.



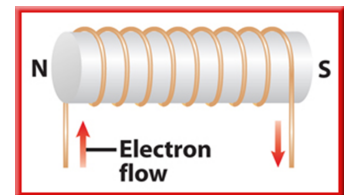
Electromagnets

Powerful magnet. Can be turned on/off.

Wrap a coil of wire around a iron core and pass an electric current through a wire.

Strength of electromagnet depends:

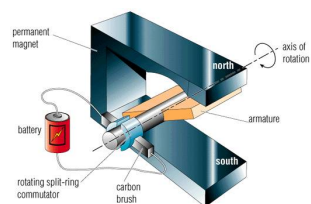
- # loops of wire
- voltage



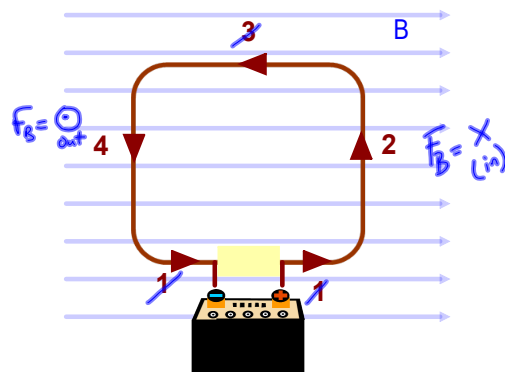
Electric Motor

An electromagnetic device that converts electric energy to mechanical energy.

Almost every appliance in which something moves contains an electric motor.

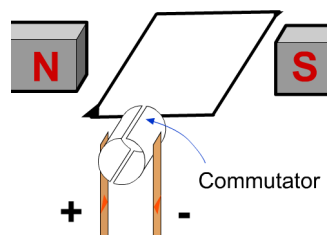


Magnetic Force



Uses of Electromagnetism

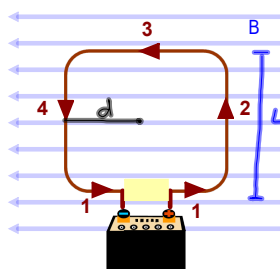
Magnetic Force: Motor



Direct Current Electric Motor.mp4

Torque

Magnetic force causes torque - causes spin!



$$T = F \cdot d$$

(for each loop)

$$F_B = I \cdot L \cdot B$$

Assignments . . .



- Lab: Motor Madness
- Chapter 36 Homework #8



Attachments

Direct Current Electric Motor.mp4