

Magnetism

I. Characteristics of Magnets

I. Magnetism

- ◆ Magnetic poles
- ◆ Magnetic field
- ◆ Magnetic domain

A. Magnetism

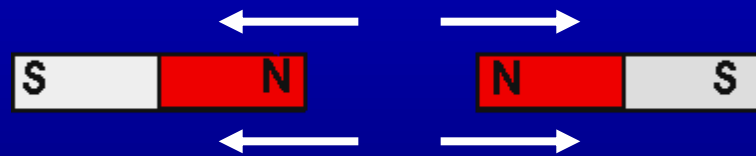
➤ Magnetism

- ◆ force of attraction or repulsion between unlike or like poles
- ◆ due to the arrangement of electrons
- ◆ closely related to electricity

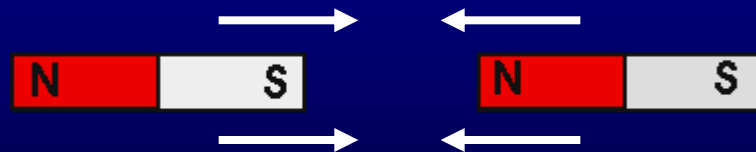
B. Magnetic Poles

➤ Magnetic Poles

- ◆ like poles repel



- ◆ unlike poles attract



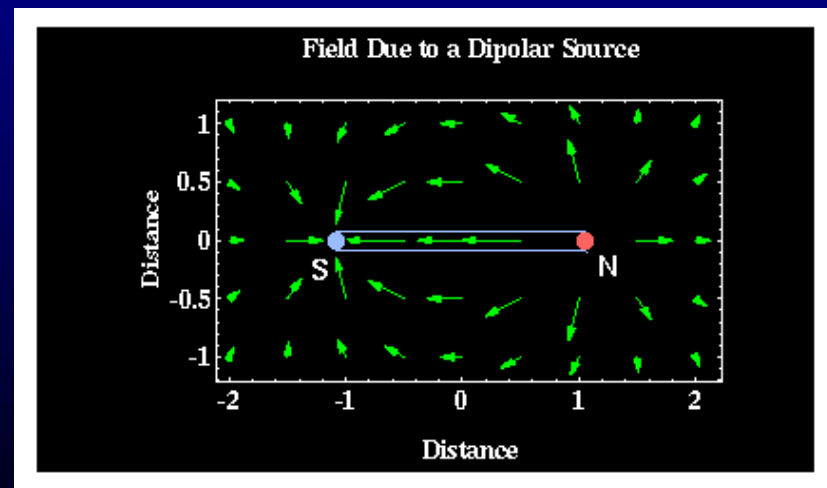
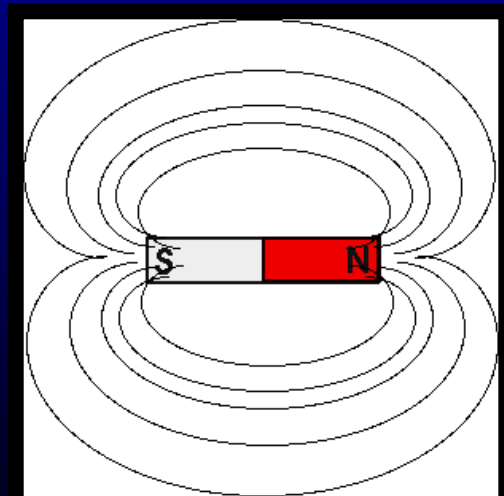
- ◆ a broken magnet creates new poles



C. Magnetic Field

➤ Magnetic Field

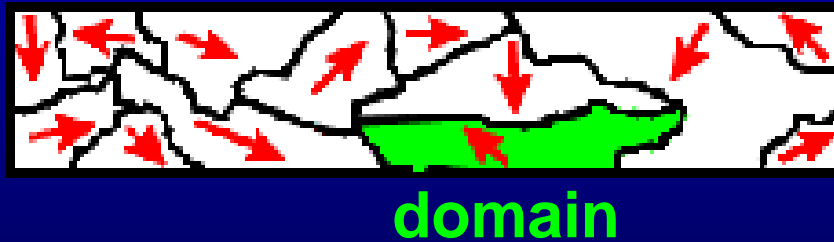
- ◆ area around a magnet where magnetic forces act
- ◆ field lines show direction of field (N→S)



D. Magnetic Domain

➤ Magnetic Domain

- ◆ groups of atoms with aligned magnetic poles



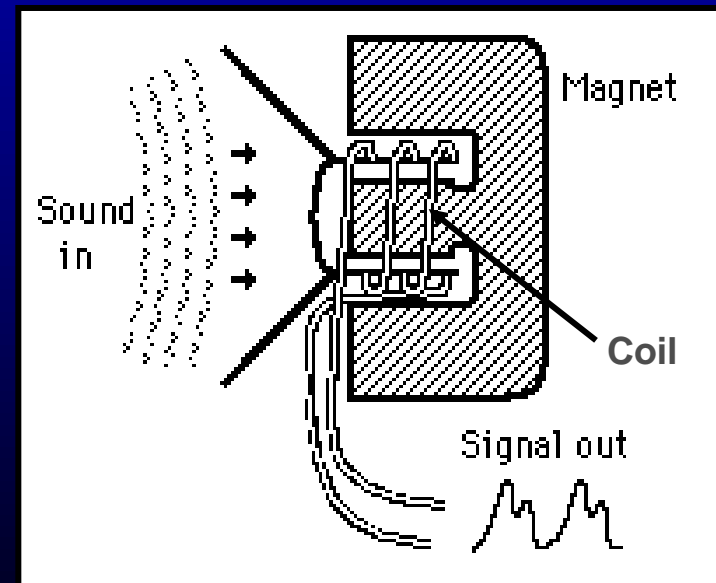
- ◆ in a magnetized object, domains are all aligned



A. Electromagnetic Induction

➤ Electromagnetic Induction

- ◆ producing a current by moving a wire through a magnetic field
- ◆ some microphones work just like mini-speakers in reverse
- ◆ sound waves cause coil to move → current

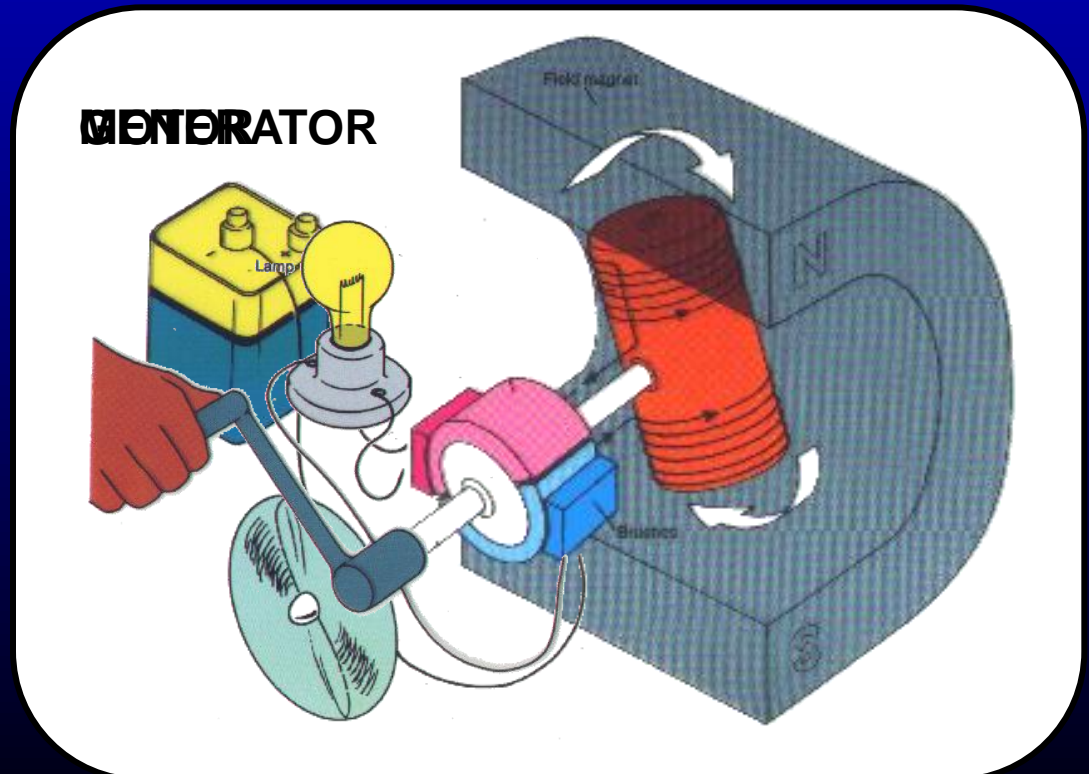


Dynamic Microphone

B. Electric Generator

➤ Electric Generator

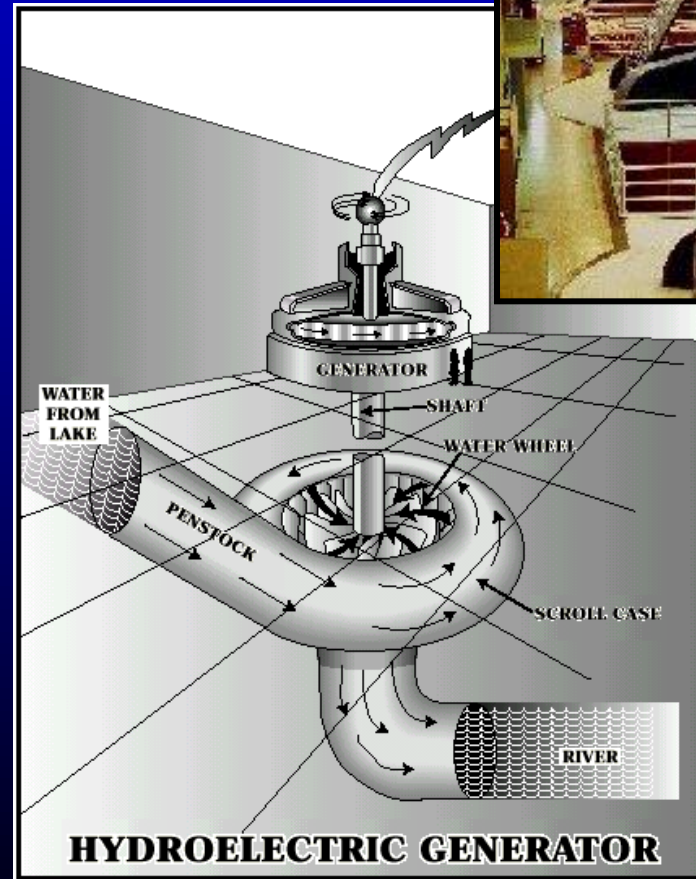
- ◆ mechanical energy → electrical energy
- ◆ armature is rotated between magnet poles
- ◆ magnetic field induces a current in the wire coil



B. Electric Generator

➤ Hydroelectric Dam

- ◆ PE of lake water is converted to KE
- ◆ mechanical KE turns the generator shaft which creates electrical energy



C. DC & AC

➤ Direct Current (DC)

- ◆ current flows in one direction
- ◆ dry cells



➤ Alternating Current (AC)

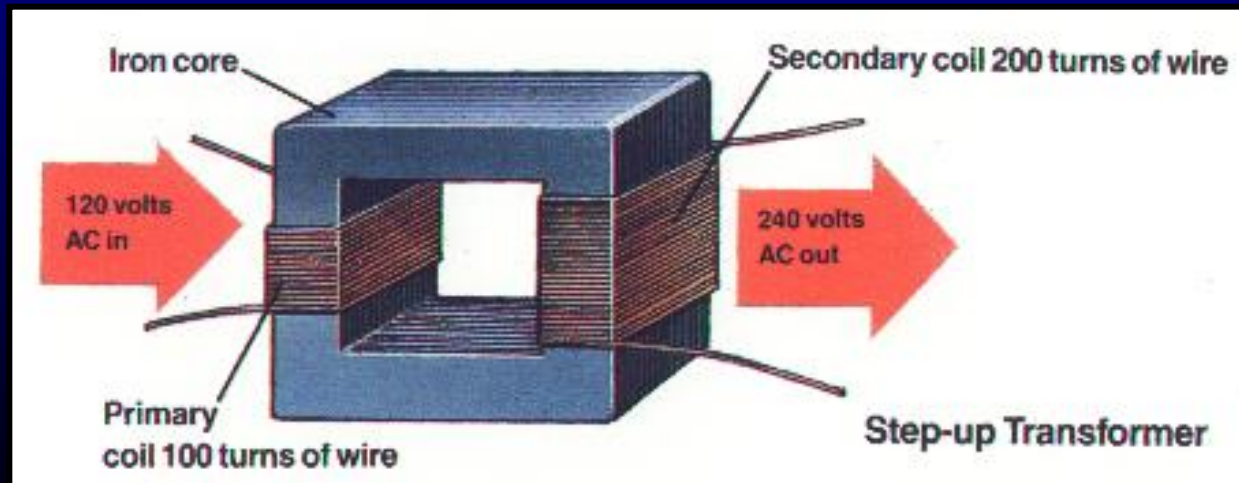
- ◆ current reverses its direction at regular intervals
- ◆ electrical outlets



D. Transformer

➤ Transformer

- ◆ increases or decreases AC voltage
- ◆ primary coil AC produces a magnetic field that induces AC in the secondary coil
- ◆ voltage ratio = ratio of turns in each coil



D. Transformer

➤ Step-up Transformer

- ◆ increases the voltage
- ◆ more turns
- ◆ power plants



➤ Step-down Transformer

- ◆ decreases the voltage
- ◆ fewer turns
- ◆ household appliances
(hairdryers, etc.)

