

Magnetism Notes

Magnetic Field: Invisible area around a magnet where a magnet can exert a force

Where is it strongest/weakest? Strongest at poles, weakest in middle

Domains: groups of atoms with aligned magnetic poles

-in unmagnetized Fe, Co, and Ni: domains are randomly oriented

-in magnets: domains are oriented in the same direction

Natural Magnet: a magnetized form of an iron containing mineral called magnetite, also called a lodestone

Law of Magnets: opposite poles attract, like poles repel

Why do compasses/magnets point north? compass needles are small permanent magnets that line up with the Earth's magnetic field. Since the north pole of this compass needle points north, and since opposite magnetic poles attract, what we call the Earth's north magnetic pole, is really the south pole of the Earth's magnetic field.

Electromagnets: temporary magnets that require electric current

Parts needed: insulated wire wrapped around an iron core

Factors that affect its strength: number of turns of wire, current strength

Meters: typically consist of an electromagnet in between two magnets, with a needle attached to the electromagnet to measure changes

Galvanometer: used to detect very small electric currents. Used in lie detectors

Ammeter: measures current, connected in series with circuit

Voltmeter: measures potential difference, connected in parallel with circuit

Electric Motor Effect: electrical energy converted to magnetic energy converted to mechanical energy of motion. Opposite of the generator effect which takes mechanical energy of moving wires and/or magnets and converts it to electricity

Electric Motor Parts (St. Louis Motor example) simplified electric motor

Electromagnet: is free to rotate on a shaft

Commutator: reverses current direction causing the poles of the electromagnet to switch and rotate toward the opposite pole of the permanent magnet

Permanent Magnet: non rotating part of motor, that alternates between attracting and repelling the poles of the rotating electromagnet.