

Unit 8 Lesson 6-9 Study Guide

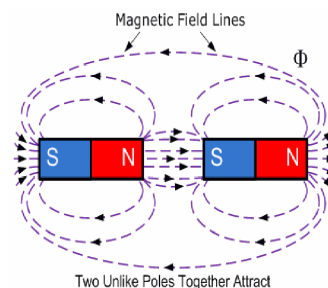
Unit 8 Vocabulary

Lessons	Term	Definition
1	Electric current	The flow of electrons through a wire
1	Electric Field	the influence throughout a space due to one or more electrically charged particles or surfaces
1	Electroscope	an instrument for detecting static electricity
1, 2, 3, 9	Generator	a machine that converts mechanical energy into electrical energy
1, 2, 3, 9	Motor	a machine that converts electrical energy into mechanical energy
2, 3	Resistance	the quality of a substance that hinders the flow of electrons through it
2	Conductor	Any material through which electricity can flow. A copper wire is a good conductor of electric charge as it flows through the circuit
2	Insulator	A substance that cannot conduct electricity very well. The rubber casing around the speaker wire serves as an insulator for the electrical current.
3	Electric Circuit	a continuous looped conducting pathway around which electricity flows
6	Dipole	an object with two sides that have opposite characteristics
6, 7	Domain	a small region in which adjacent atoms that have magnetic fields line up with their magnetic fields oriented in the same direction
6	Magnetic Field	The space around every magnet where the magnetic force can be felt
6	Magnetic Pole	The two ends of a magnet, where the magnetic force is especially strong. Bar magnets have two magnetic poles.
7	Electromagnet	A temporary magnet made using electric current, usually running around a metal core.

Lesson 6: Magnetism

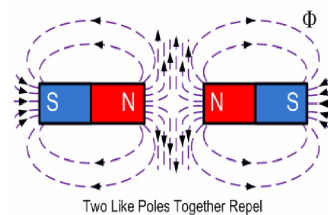
Bar Magnets

- Bar magnets are magnetized metal
- The two ends of the bar are called magnetic _____
 - The poles are called: the _____ and the _____ poles
 - Having two poles makes magnets dipolar



Opposites Attract, Likes Repel

- The poles of magnets like electrically charged particles
- North and South poles _____ each other
- North and North OR South and South poles repel each other
- Dipole: an object with two sides that have opposite characteristics



Domains

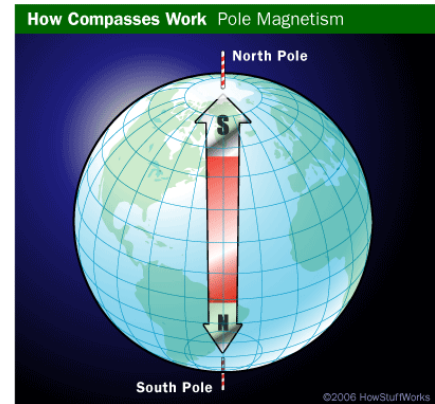
- Domains: small regions in which _____ atoms that have magnetic fields _____ with their magnetic fields oriented in the same direction

How Are Magnets Made?

- The DOMAINS are lined up!
- Permanent Magnets - all their magnetic domains are _____ more in one direction than in others
 - Examples: horseshoe, bar magnets
- Temporary Magnets – magnetic domains are aligned but do not stay aligned
 - Examples: paper clips, nails, metal “junk”

Magnets Exert Force

- Magnetic Field: the space around every magnet where the magnetic _____ can be felt
 - Magnets do not have to touch an object to exert a force on it
 - Force is STRONGEST near the poles and becomes weaker further away from the poles.



Earth as a Magnet

- The Earth acts like a magnet – a giant bar magnet

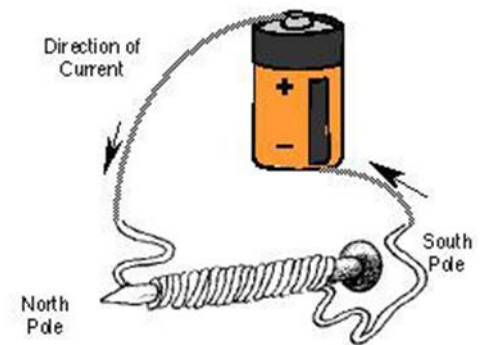
Lesson 7: Electricity and Magnetism

A Temporary Magnet

- _____ are temporary magnets made using electric current, usually running around a metal core.

Parts of an Electromagnet

- LABEL the parts in the diagram
 - Electricity _____:
 - Metallic core:
 - Coiled wire:



The Strength of Electromagnets:

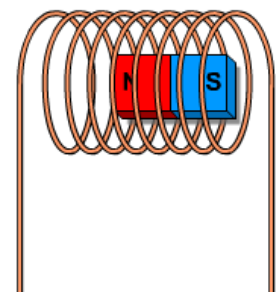
- Current of Electricity: add more batteries AND/OR _____ the voltage of a battery
- Coils of Wire: add more coils of wire around the magnetic core

Measuring Current: Galvanometers

- An instrument called a galvanometer uses a movable permanent magnet to detect the _____ magnetic field around an electric current.

Making Electric Currents

- A moving _____ charge creates a _____ field, ...
 - But, a magnetic field can cause an electric charge to move too.



- As long as the magnet is stationary, nothing happens. However, if the magnet moves, its changing field at the wire affects charged particles—electrons—in the wire. The _____ begin to flow as an electric current.

Lesson 8: Lab: Motoring On!

– see OLS lesson, class connect session, and website

Lesson 9: Motors and Generators

Explore!

- What makes the blades spin on an electric fan?
 - The combined effect of electric currents and magnetic forces turn electrical energy into mechanical energy.
 - REMEMBER: Any time an electric current flows through a wire, the current produces a magnetic field.

An Electric Motor

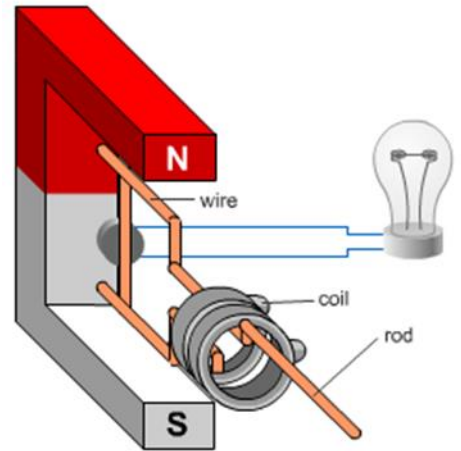
- Motor - a machine that converts electrical energy into mechanical energy

Electric Generators

- Generator – a machine that converts mechanical energy into electrical energy

Electricity From Motion

- Turbine - a machine for producing continuous power in which a wheel or rotor, typically fitted with vanes, is made to revolve by a fast-moving flow of water, steam, gas, air, or other fluid



Electric Motor (Motion from electricity)	Electric Generator (Electricity from motion)
<ul style="list-style-type: none"> • Motor - a machine that converts electrical energy into mechanical energy • _____ → Mechanical 	<ul style="list-style-type: none"> • Generator – a machine that converts mechanical energy into electrical energy • _____ → Electrical
<p>Examples: fans, power tools, washing machine, dishwasher, blow dryer for hair</p>	<p>Examples: power plants (turbines), gas generators used in emergencies</p>