

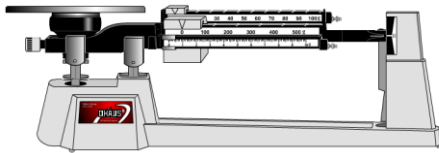


Energy Vocabulary Standards 6.P.3A1-6 and 6.P.3B1-2

1. Energy	the ability to do work
2. Mechanical	all energy that is in a moving object (ex: moving car, rolling bicycle, flying airplane, and blowing wind)
3. Mechanical Potential Energy	stored energy or energy of position, this energy has “potential” to move (ex. rock at the top of a hill, water behind a dam, a stretched rubber band)
4. Mechanical Kinetic Energy	energy of motion, something is moving in all forms of energy for instance thermal, electrical, light & sound (ex. a rock <i>falling</i> from the top of a hill, water <i>going</i> over a dam, <i>releasing</i> a stretched rubber band *verbs show motion)
5. Heat/Thermal Energy	the total energy of the particles that make up an object associated with motion
6. Radiant *Solar Energy is a type of radiant energy.	the energy from the SUN, which provides heat and light transmitted by electromagnetic waves (stars, light bulbs, microwaves)
7. Chemical Energy	energy stored in particles of matter (ex. batteries, sugar, food *plants/photosynthesis)
8. Electrical Energy	energy flowing in an electric circuit (ex. sources of electrical energy: a battery, solar energy in solar cells, a generator)
9. Light Energy	can be produced in an electric circuit if a light bulb is added to the circuit
10. Sound Energy	can be produced in an electric circuit if a bell, buzzer, radio, or TV is added to the circuit
11. Nuclear Energy	Splitting Uranium atoms in a process called fission involving a nucleus of an atom (ex. the atomic bomb)
12. Law of Conservation of Energy	Energy can neither be created nor destroyed, it just changes form.
	
13. Energy Transformation	The process of changing energy from one form to another. (the → means transforms into). <u>Example #1</u> : when you eat food, rest and then go running it is an energy transformation=[chemical → mechanical potential → kinetic energy] <u>Example #2</u> : toaster=[electrical→mechanical→heat→light→sound]
14. Work Formula	$W = F \times d$ (Work (J) or Nm = Force (N) x distance (m)
15. Force	A push or a pull that can move an object.
16. Joule (J or 1 Nm)	Unit of energy used to measure work. It is equal to one Newton-meter (1 Nm)
17. Newton (N)	Unit used to measure the strength of force using a tool called a spring scale.
18. Spring Scale	Tool used to measure weight or force in Newtons (N).
	
19. Triple-Beam Balance	Tool used to measure mass in grams.

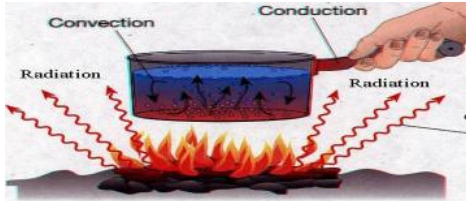
Triple Beam Balance



20. Meter Stick

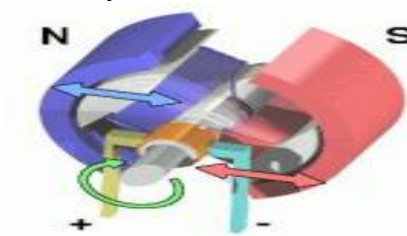
Used to measure meters (m), centimeters (cm) or millimeters (mm) of a distance.

21. Three (3) Forms of Heat Transfer



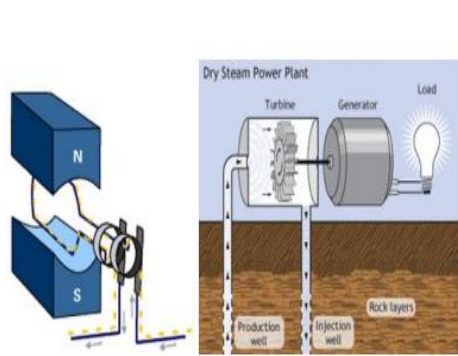
1. conduction -the transfer of heat energy between objects that are touching.
2. convection -the transfer of heat throughout a liquid or gas by currents.
3. radiation-the transfer of heat energy through empty space or air.

22. Simple Electric Motors



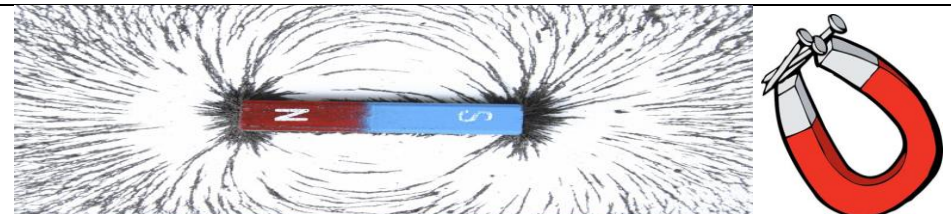
- An electric motor changes electrical energy to mechanical energy.
- It contains an electromagnet that rotates between the poles of a magnet.
- The coil of the electromagnet is connected to a battery or other source of electric current.

23. Generators



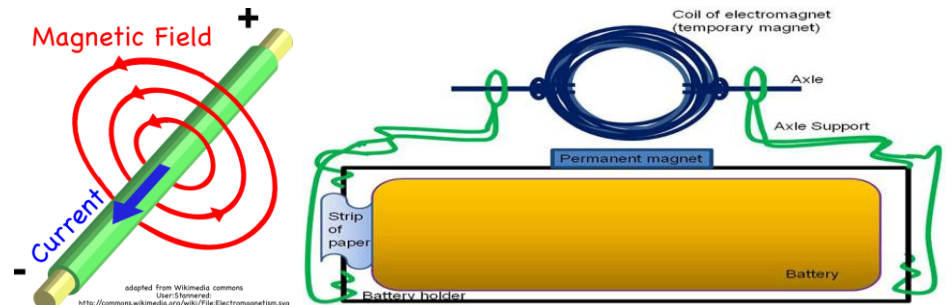
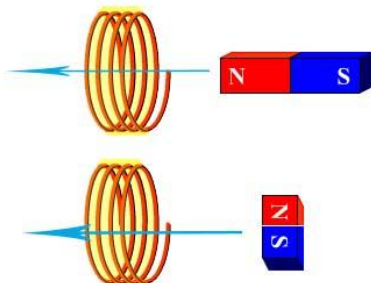
- A generator produces an electric current when a coil of wire wrapped around an iron core is rotated near a magnet.
- Generators at power plants produce electric energy for our homes.
- A generator contains coils of wire that are stationary, and rotating magnets are rotated by turbines. Turbines are huge wheels that rotate when pushed by water, wind, or steam.
- Thus mechanical energy is changed to electrical energy by a generator. Smaller generators may be powered by gasoline.

24. magnetism- the force of attraction or repulsion of magnetic materials (ex. A compass, iron filings, paperclips.



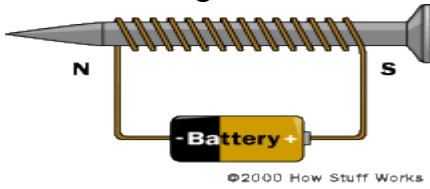
25. electric current

A coil of wire spinning around a magnet or a magnet spinning around a coil of wire can form this.



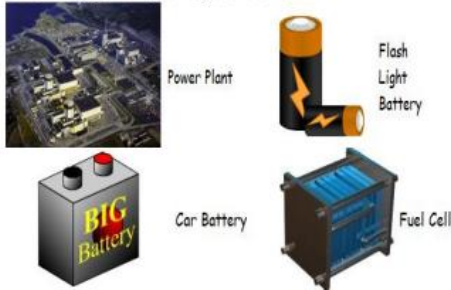
adapted from Wikimedia commons User:Stamerd! http://commons.wikimedia.org/wiki/File:Electromagneten.org

26. Electromagnets



- An electromagnet is formed when a wire in an electric circuit is wrapped around an iron core producing a magnetic field.
- The magnet that results loses its magnetism if the electric current stops flowing.

27. Voltage Source



- a source of electrical energy in an electric circuit. The voltage for any electric circuit can come from many different sources. Some common examples are: batteries, power plants, fuel cells.

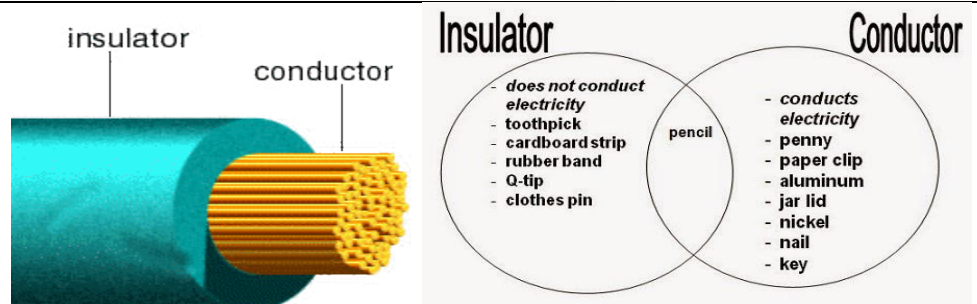
28. switch- device used to open and close an electric circuit.



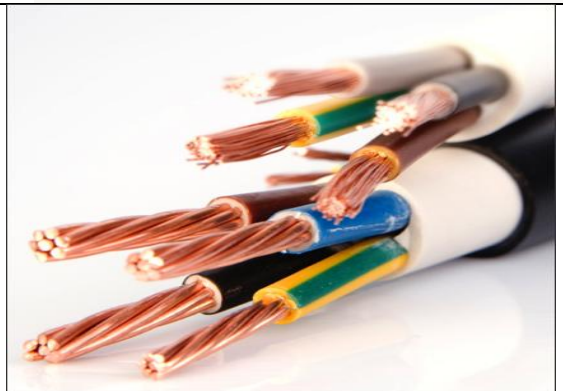
29. resistor-any device that converts electrical energy into other forms of energy (Ex. light bulb).



30. insulator-any material that DOES NOT allow electrical current to flow through an electric circuit (plastic, glass, paper, cardboard)



31. conductor -material that allows electrical current to flow through an electric circuit (ex. Most metals are conductors of electrical current, but Copper wire is the most excellent conductor).



32. Transformer-changes electrical energy into something else. In an electric circuit, the transformer is whatever you are trying to power on. For example: radio, light, projector, iPad, etc.

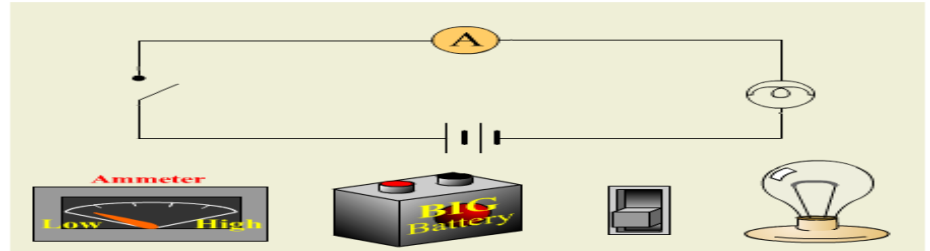
A light bulb changes electrical energy into radiant energy.



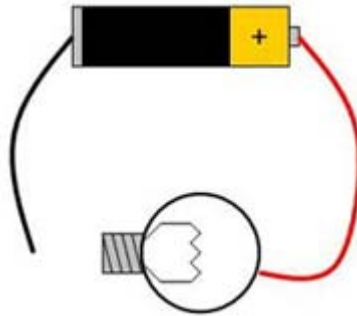
Electric pole transformer.

33. Four (4) Parts to a Simple Circuit

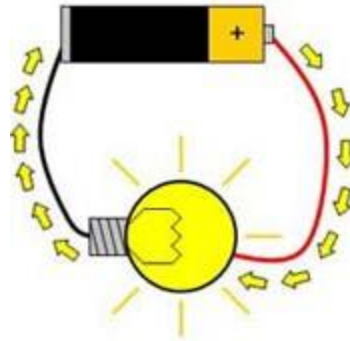
1. Wire
2. Voltage source
3. Switch
4. resistor



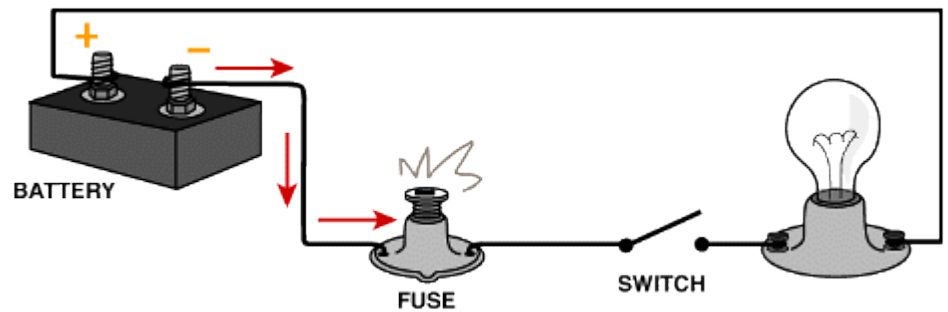
34. open circuit-electricity is not able to flow, the item you are trying to power will NOT be "ON."



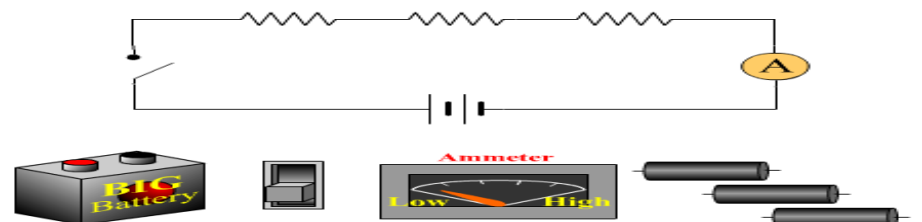
35. closed circuit-electricity is able to flow, the item you are trying to power WILL be ON!

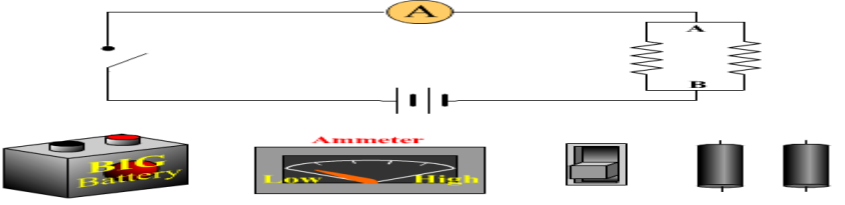
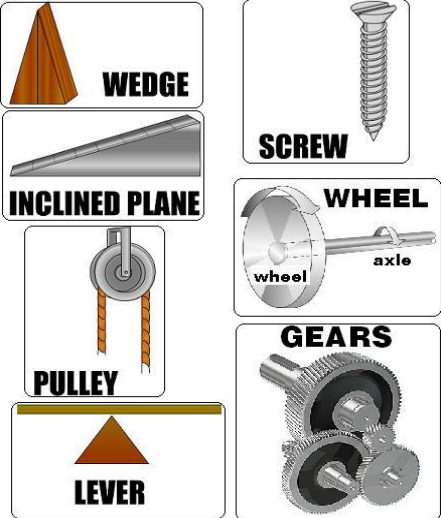



36. switch- purpose of a switch is to control whether a circuit is closed (electricity is flowing) or open (electricity is not flowing).



37. Series circuit-an electric circuit with one path for an electric current.



<p>38. Parallel circuit- an electric circuit with multiple paths for an electric current.</p>	
<p>39. Six (6) Simple Machines plus the gear</p> 	<p>Simple machines <i>reduce</i> force, not work. The way a simple machine is made (shape, size, what it is made of) can improve the mechanical efficiency.</p> <p>WIPPL SWAG –Mnemonic Device to remember it.</p> <ol style="list-style-type: none"> 1. <u>W</u>edge-two inclined planes back to back 2. <u>I</u>nclined plane-ramp 3. <u>P</u>ulley-groved wheel and a cable/rope that passes over it 4. <u>L</u>ever-rigid bar that rest on top of a fulcrum/pivot point 5. <u>S</u>crew-inclined plane wrapped around a cylinder 6. <u>W</u>heel & <u>A</u>xle-wheel that has a cylinder through it that allows it to rotate 7. <u>G</u>ear-rotating machine part having teeth or cogs that move one another to accomplish a task
<p>40. Complex/Compound Machines</p>	<p>Two or more simple machines working together (ex. scissors, bike, stapler, wheel barrow, can opener, crane).</p> 
<p>41. input energy</p>	<p>Effort force.</p>
<p>42. mechanical efficiency</p>	<p>Measures how well a machine converts input energy, work, and power into output energy, work, and power. Ideal machine efficiency is 100%.</p>
<p>43. friction</p>	<p>Reducing friction is an important way to improve the efficiency of a machine. Example: a pulley with a rope running over a wheel is more efficient than a pulley with a rope running over a bar. The spinning wheel pulley makes the machine more efficient.</p>