

Unit 6 Lesson 1 Notes ①

Forms of Energy

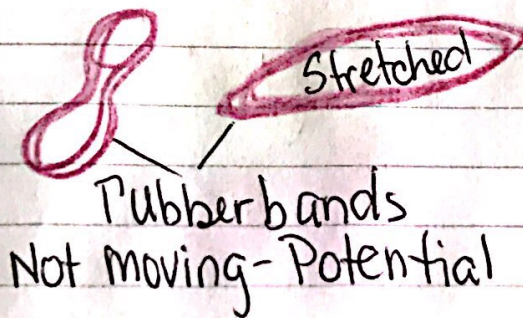
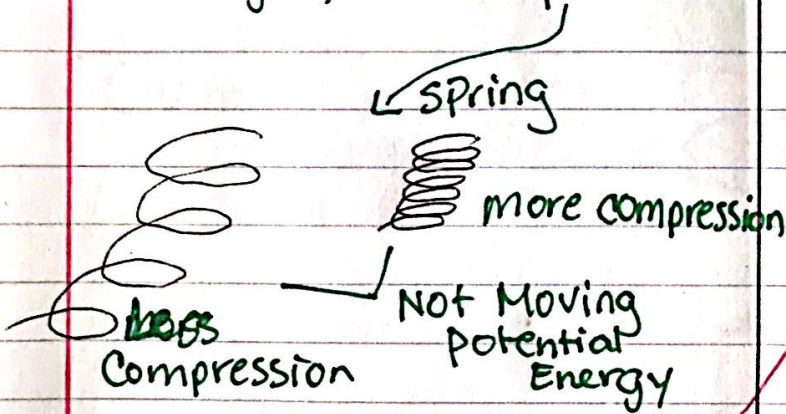
Energy: the ability to cause changes in matter
causes:

- Changes in shape
- Changes in temperature
- Changes in motion

* Can be transformed from one form to another
* CANNOT be created nor destroyed

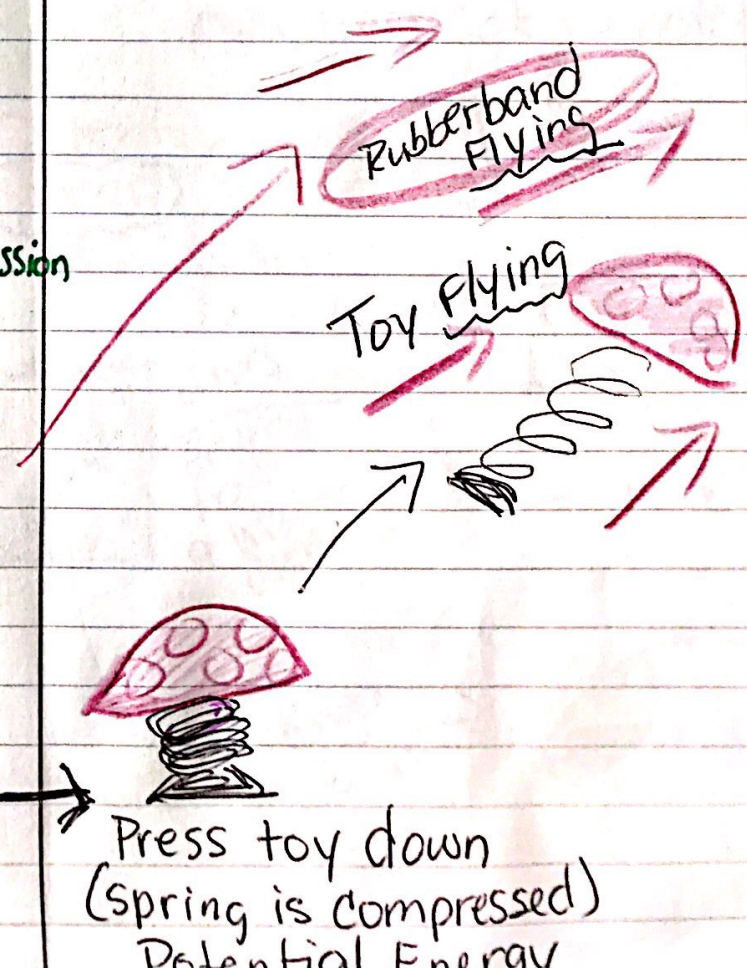
Potential Energy

- Energy of position or shape
- Increases with mass, height, and compression

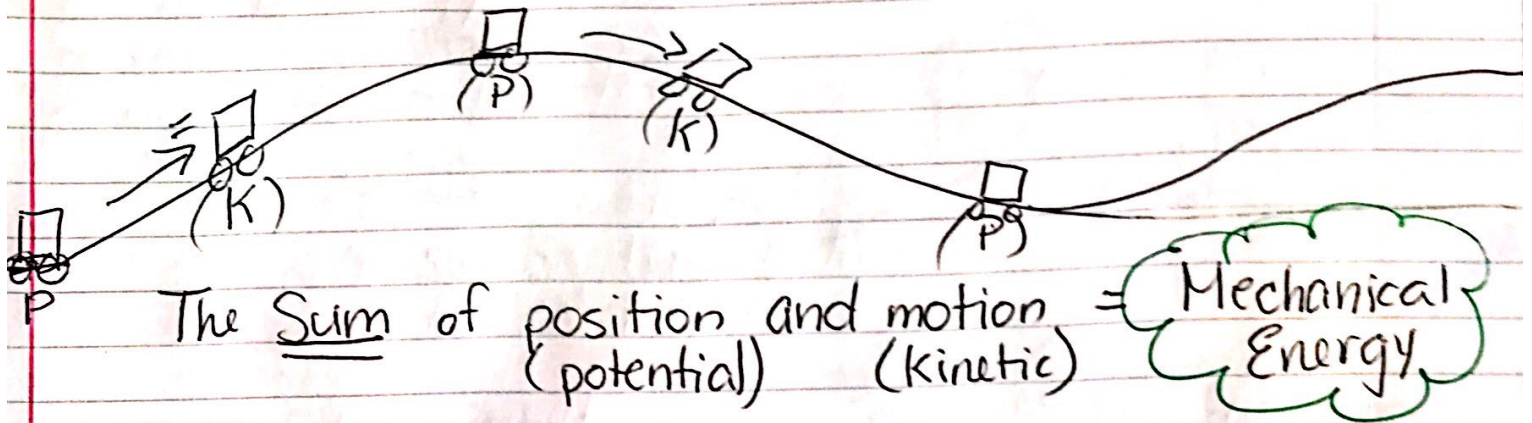


Kinetic Energy

- Energy of MOTION
- Increases with mass & speed



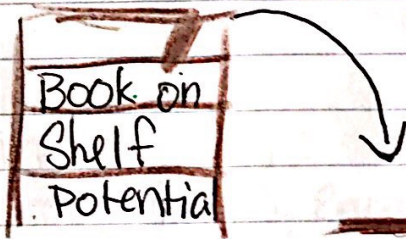
Unit 6 Lesson 1 Notes (2)



The Sum of position and motion (potential) (kinetic) =

Mechanical Energy

Mechanical Energy: stays **CONSTANT**



As the book falls:

Potential energy decreases
Kinetic energy increases
then it lands → loses its kinetic energy back to potential

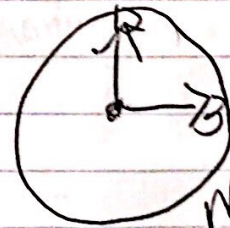
The total mechanical energy **STAYS** the same with more/less

Chemical Energy: (Potential Energy)
* Energy that is **stored** and released by a chemical reaction

Food stored for Energy our bodies



Gives Energy to a Watch clock



has Mechanical Energy



Gives Energy to a car



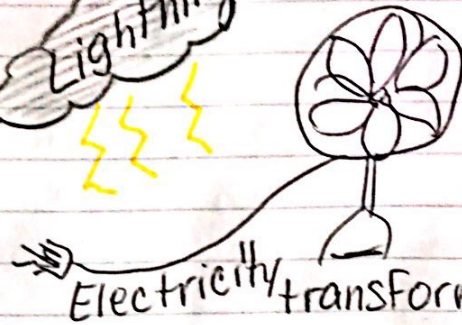
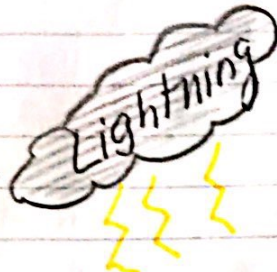
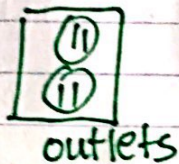
Mechanical Energy

Unit 6 Lesson 1 Notes ③

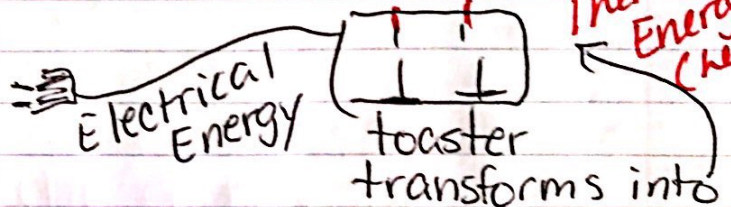
Forms of Kinetic Energy

Electrical Energy

- Energy caused by the movement of electrical charges.
- Transforms into:
 - heat
 - sound
 - motion



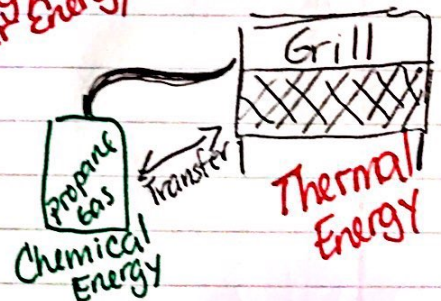
Mechanical Energy (Spinning of Blades)



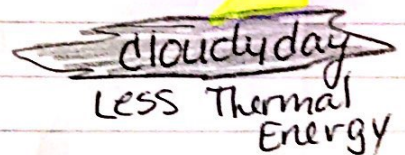
Thermal Energy (Heat)

Thermal Energy:

- the total Kinetic Energy of the particles that make up a substance.
- Heat
- Measured by a thermometer

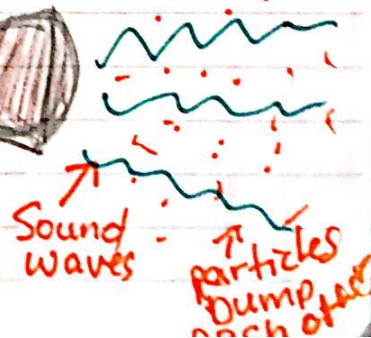
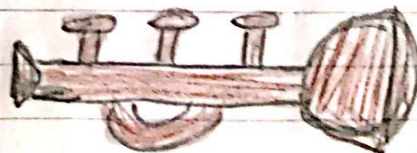


Friction: Rubbing hands produces Thermal Energy



Sound Energy:

- A form of energy that is carried in waves
- Produced by vibrations
- Needs a medium (matter) liquid, solid, gas



Pitch: how fast or slow the vibrations are

Fast high pitch

slow low pitch

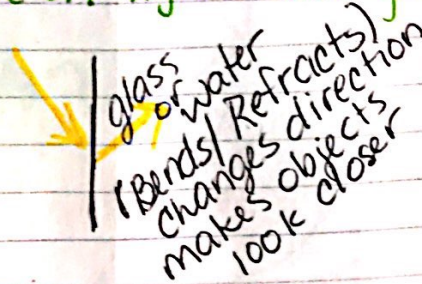
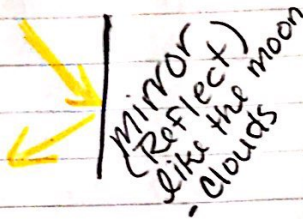
Unit 6 Lesson 1 Notes (4)

Light Energy

• travels in waves → straight line

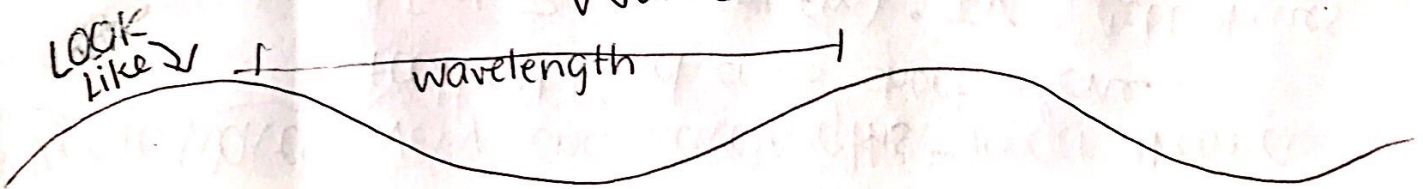


- can travel through space (do NOT need a medium)
- can pass through air or glass
- * most objects that give off light → also give off heat



OPAQUE: light cannot go through (door) - creates a shadow
TRANSLUCENT: Some light can get through, but not all (tinted window)
TRANSPARENT: Light can pass through easily (window)

LOW Energy WAVES

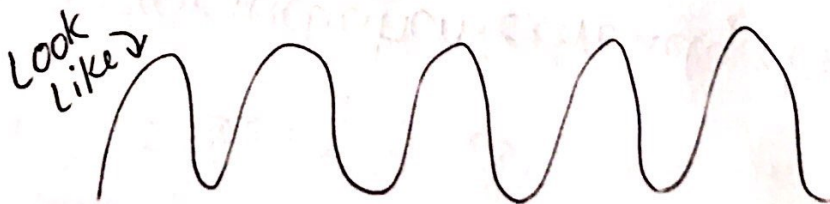


Visible light: Light we see

ROYGBIV

Red orange yellow Green Blue Indigo Violet

High Energy Waves



Radio waves: very long wavelengths - longer than a football field or as short as one

* Used for: Radio (AM, FM); TV; Cell phones

Micro waves: cause water and fat molecules to vibrate, which makes a substance hot.

* Used for: cooking/heating

Infrared: lies between microwaves & visible light
The heat we feel from the sun, fire, hot blankets, etc the skin detects.

* Used for: Night vision; Space pictures; infrared pictures

Visible light: Light we see

Red orange yellow
Green Blue Indigo violet
R O Y G B I V

Ultra violet: Wavelengths shorter than visible but longer than X-Rays

* Used for: tans (can cause cancer if overexposed - burns)
helps seasonal depression, & grows plants

X-Rays: Can go through most substances and can be dangerous if over exposed

* Used for: seeing bones

Gamma Rays: nuclear radiation: extremely dangerous; kills living cells

* Used for: cancer treatment

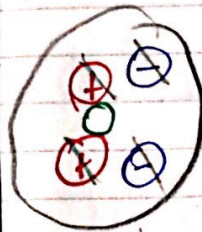
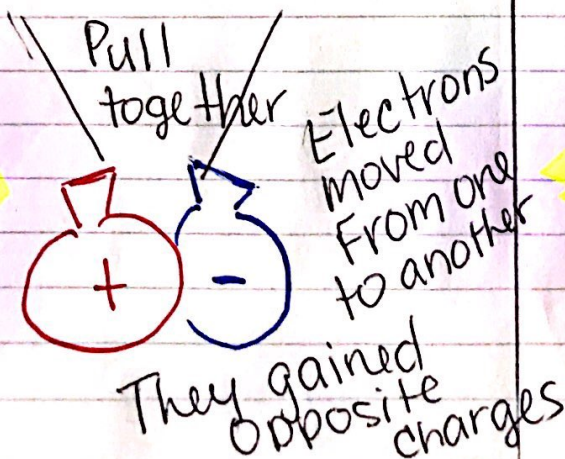
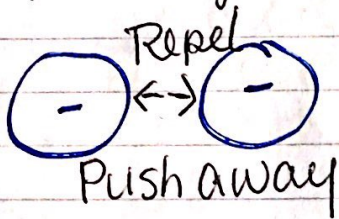
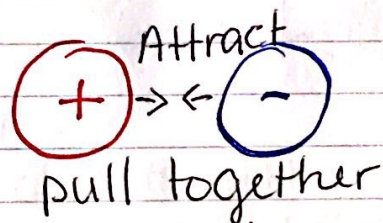
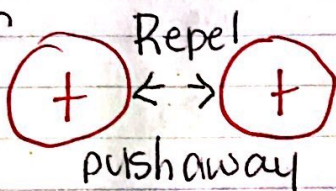
Unit 6 Lesson 3 Notes ①
What is Electricity?

Atoms: Building blocks of ALL matter

Subatomic Particles:

located in the nucleus
Protons +1
Neutron (No charge)
Electrons -1

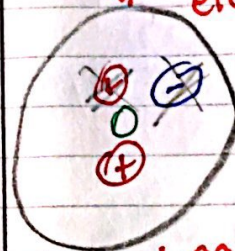
Particle Charges:
+ How they behave



0 neutrons
+2 protons
-2 electrons

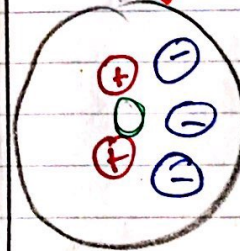
0 charge
neutral charge

↓ loses an electron (-)



+2 protons
-1 electron
+1 charge (positive)

↓ gains 2 electrons (-)



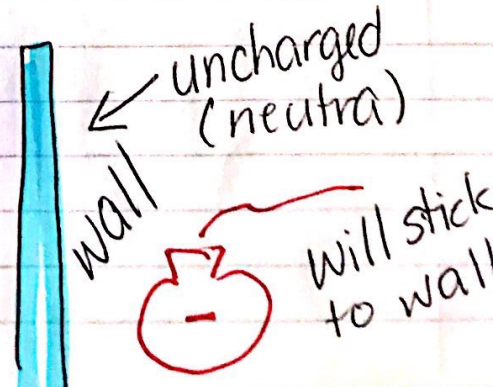
+2 protons
-3 electrons
-1 charge (negative)

STATIC ELECTRICITY

* Build up of charges - Slight Sh

- Rub balloon on head
- Drag feet on carpet → touch door

ON Test



Unit 4 Lesson 3 Notes 2

Electric Charges



DO THE MATH

Positive and Negative Numbers

Fill in the missing squares.

Original Charge on an Object	Electrons Gained or Lost (negative)	Final Charge on the Object
+300	Gains 270	+30
-300	Loses 525	+225
-270	Gains 230	-500

Start with

$$\begin{array}{r} +300 \text{ (300 more protons)} \\ -270 \text{ (270 electrons are added)} \\ \hline +30 \text{ (gained)} \end{array}$$

$$\begin{array}{r} -300 \text{ (300 more electrons)} \\ \text{Loses 525 (525 electrons left)} \\ \hline +225 \end{array}$$

$$\begin{array}{r} -270 \text{ (270 more electrons)} \\ -230 \text{ Gain} \\ \hline -500 \text{ (500 more electrons)} \end{array}$$

on test

$$+12 \text{ Lose } 10 \text{ } +22$$

Lightning

Cause

An object with a negative charge \rightarrow is placed near an object with a positive

Effect

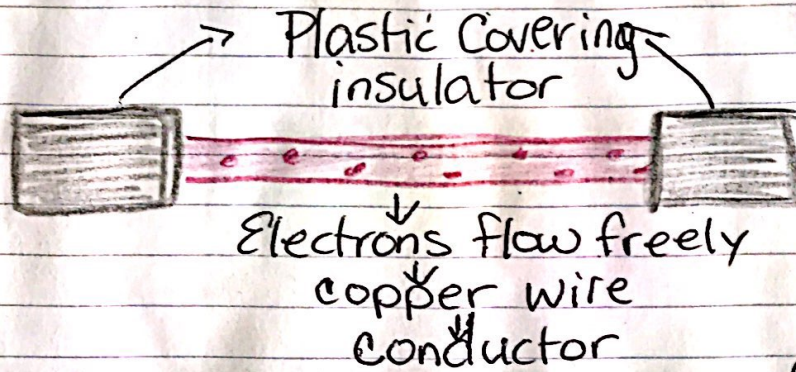
Electrons (-) jump from the negatively charged object to the positively charged object

Huge Electrostatic discharge (lightning)

Unit 6 Lesson 3 Notes ③

Electric Current

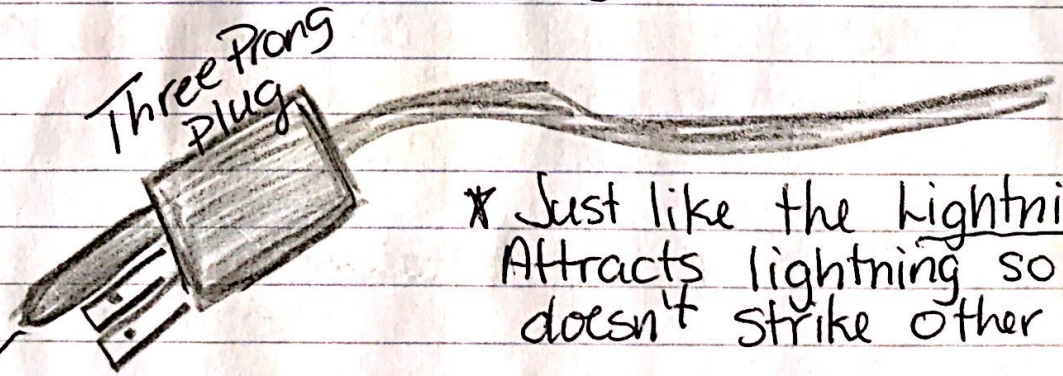
- A path in which electric charges flow
- Electrons move through wires



Batteries must have a chemical reaction to move electrons

Energy Stations

- electricity generating stations (producing)
- passes electricity to
 - homes using wires
 - schools
 - business



* Just like the Lightning Rod attracts lightning so it doesn't strike other things

ON Test

Round Prong → Protects from electric shock (like the plastic covering)

Unit 6 Lesson 5 Notes ①

Electricity

* Electricity has made our lives easier.
* tasks are now performed by appliances

* Electrical Energy is transformed into other energies

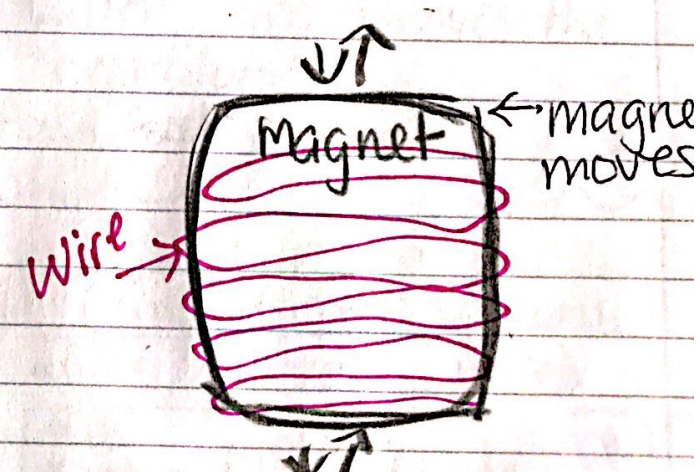
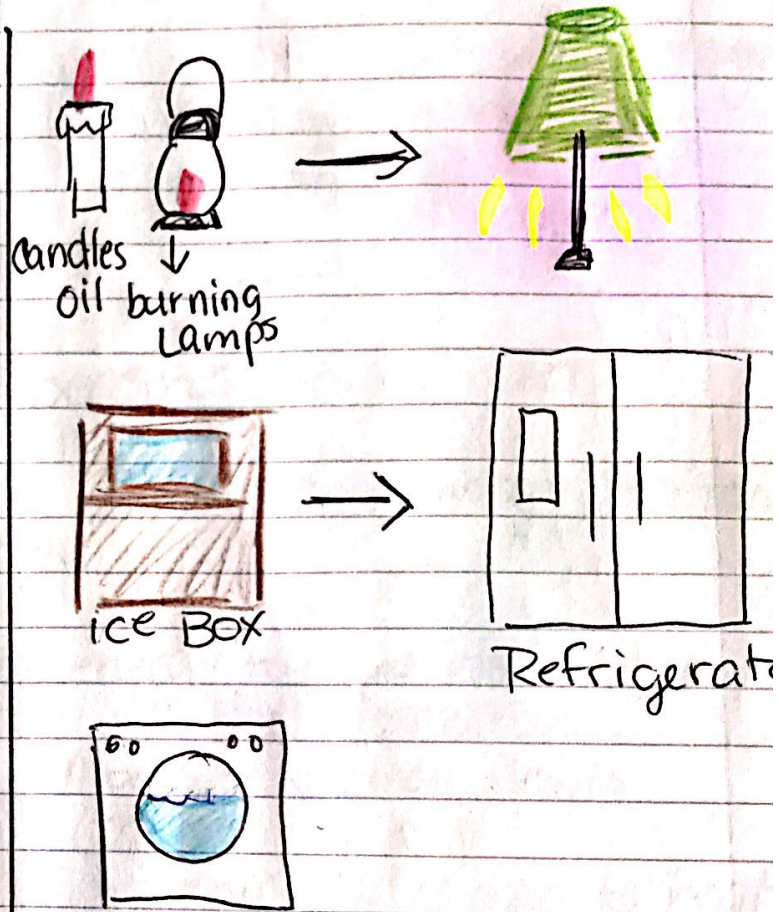
* Electricity improved entertainment

* Electric Motor
- is a device that changes electrical energy into mechanical energy

Generators : Magnets

- Change kinetic energy into electrical energy
- moving a magnet and a wire near each other which produces an electric current

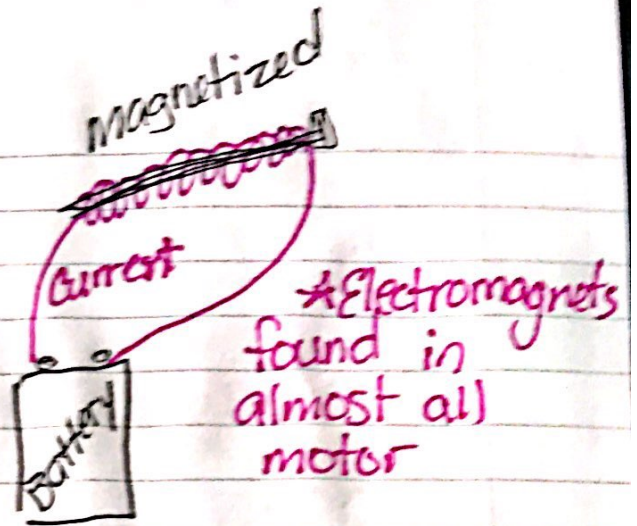
* MAGNETS PRODUCE ELECTRICITY



Unit 6 Lesson 5 Notes ②

Electromagnet

- A device that uses electricity to produce magnetism
- If you have a wire with an electrical current wrapped around a metal object, that object becomes magnetized



Electric Generating Stations (Energy Stations)

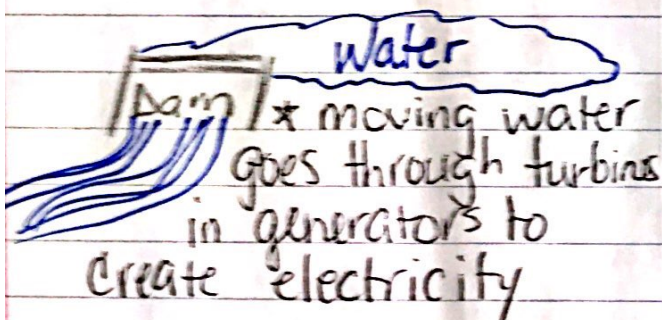
- * Produce electricity
- * Use Generators

↳ Use Kinetic energy to make electricity

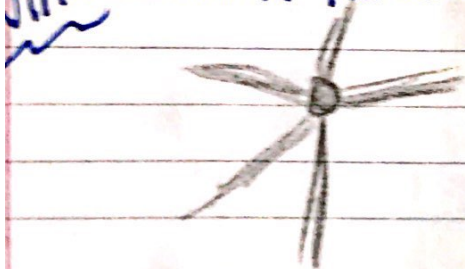
Renewable Resources



Hydroelectric Dams



Wind - Wind turbines



Non-Renewable

- Atoms → Nuclear Plants
- Coal
 - ↳ Burning Coal is used to heat water, steam moves the generators
- * Fossil Fuels

ON TEST

Generating Stations

