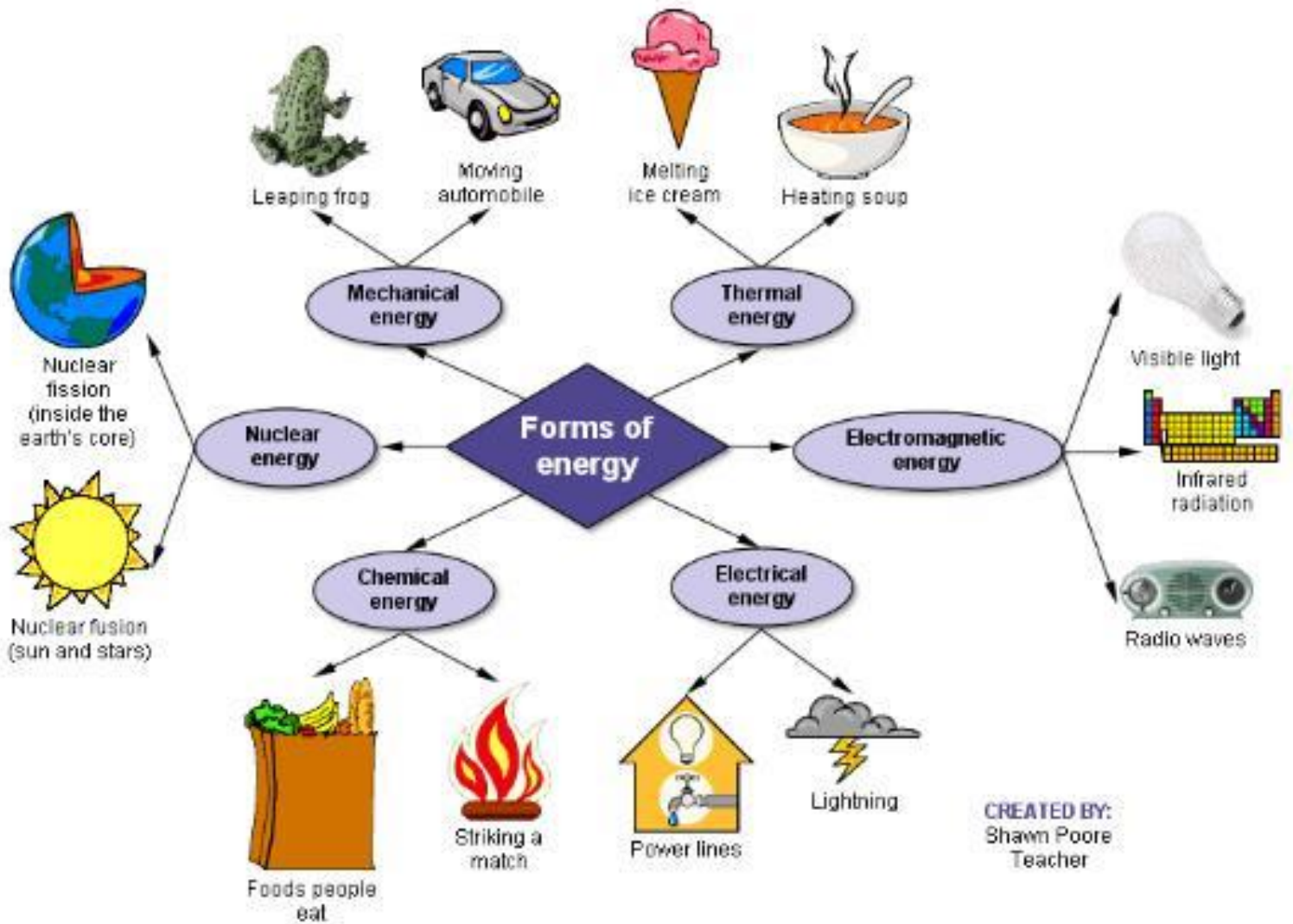
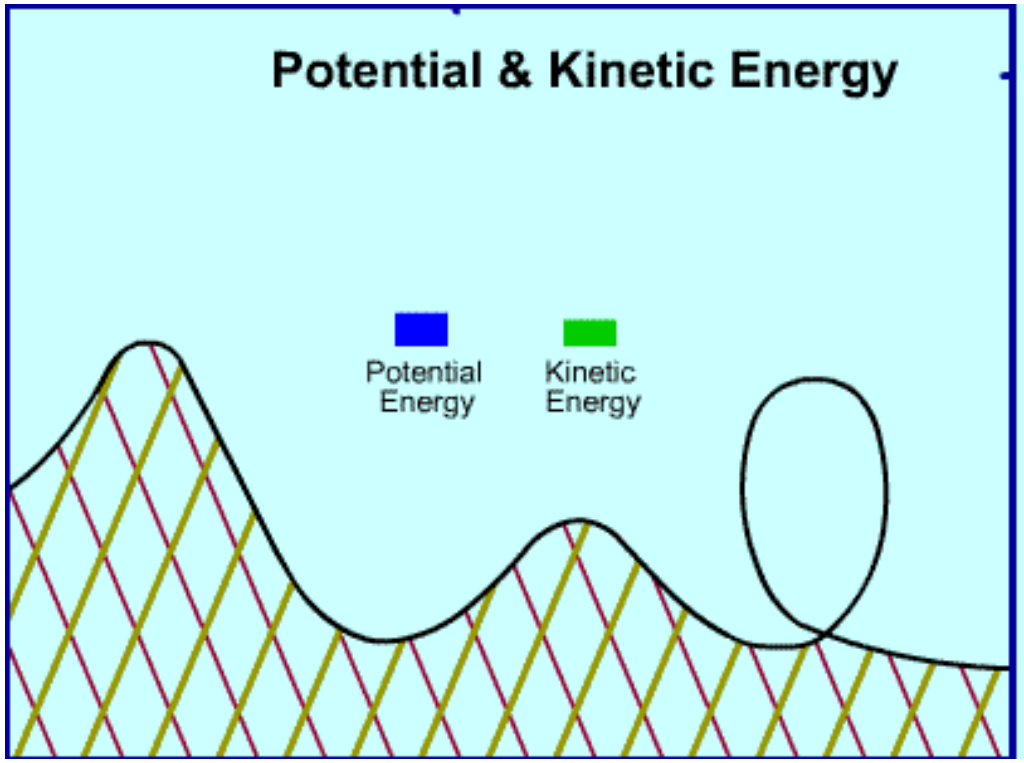
Review 1st Quarter

Types of Energy



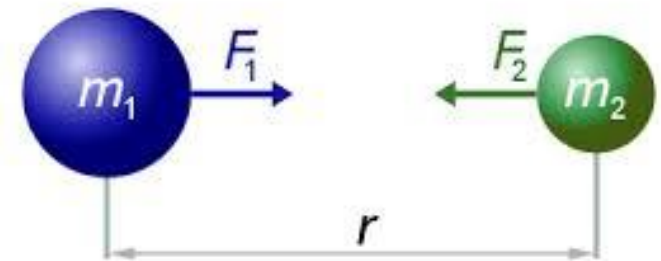
Kinetic & Potential Energy

- Kinetic = ½ mv^2
- Potential = mgh
- Conservation of Energy

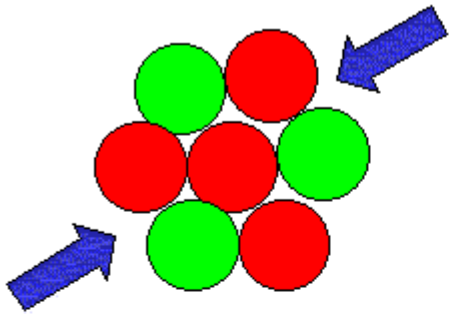


Four Main Forces

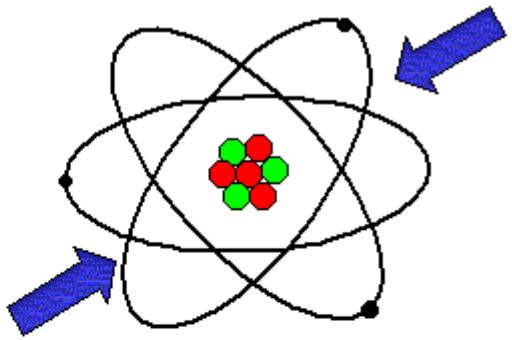
- Gravitational Force:
  - Depends on masses of two objects and the distance between them



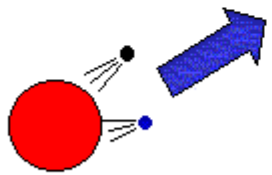
$$F_1 = F_2 = G\frac{m_1 \times m_2}{r^2}$$



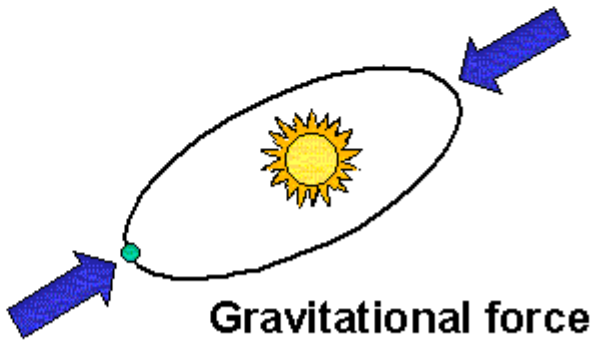
Strong force
binds the nucleus



Electromagnetic
force binds atoms



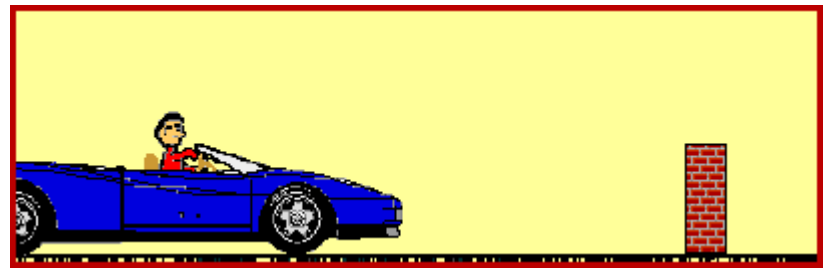
Weak force in
radioactive decay



Gravitational force
binds the solar system

Newton's 3 Laws

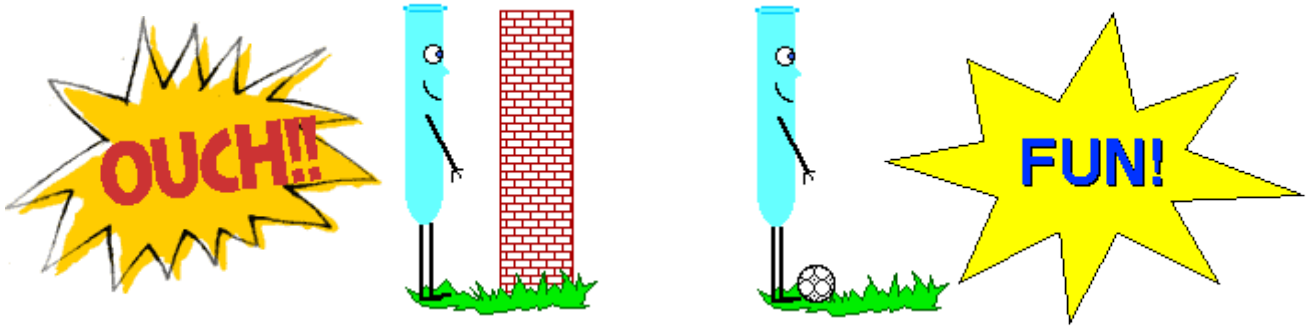
- 1st Law: Object stays in same direction/velocity unless acted on by a force



- 2nd Law: acceleration is produced when a force acts on a mass

  F=ma

  INERTIA



- 3rd Law: For every action there is an equal and opposite reaction

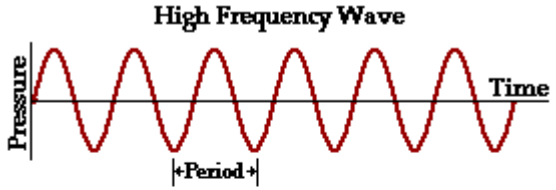
Work and Power

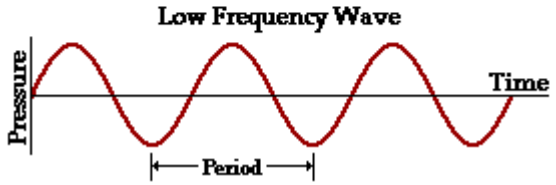
- Work: when you apply force to an object and it MOVES
  - Work =Force * distance (W=Fd)

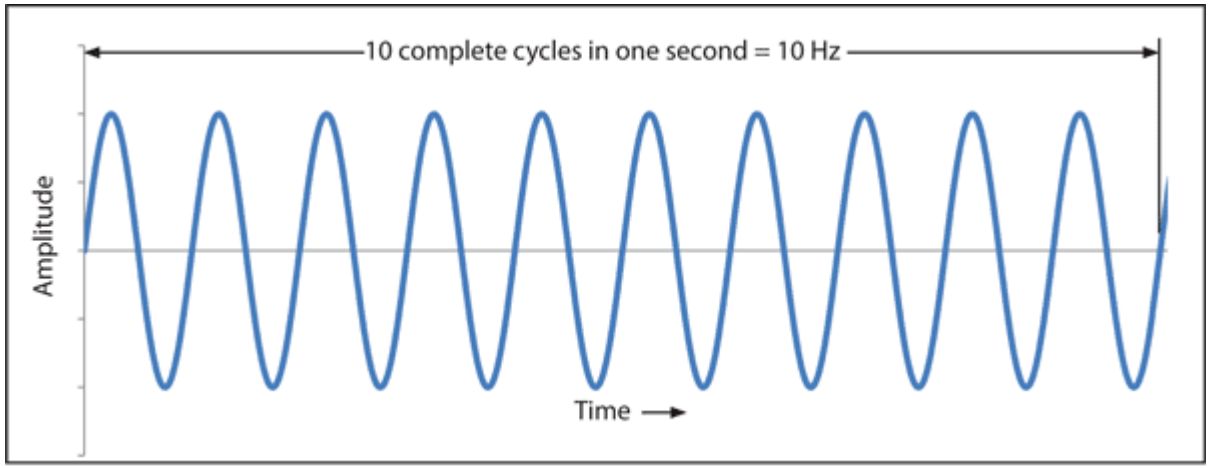
- Power: the rate work is done
  - Power = work/time (P=W/t)

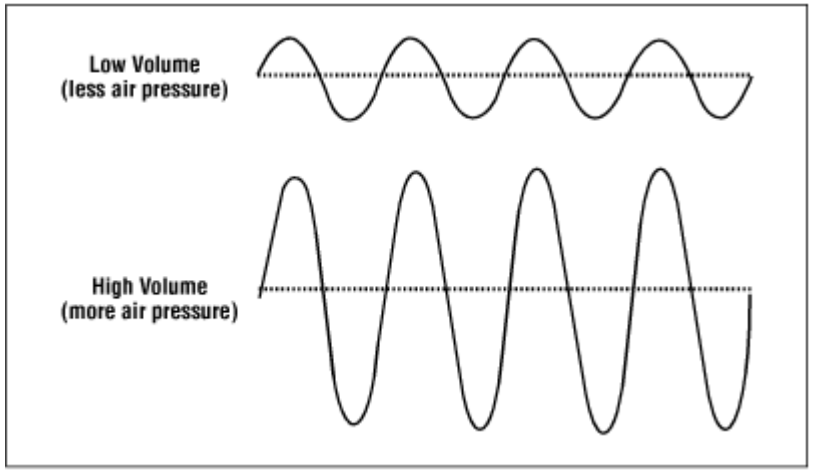
Waves, Frequency, Period

- Frequency: how often something repeats
- Period: time it takes for one complete cycle

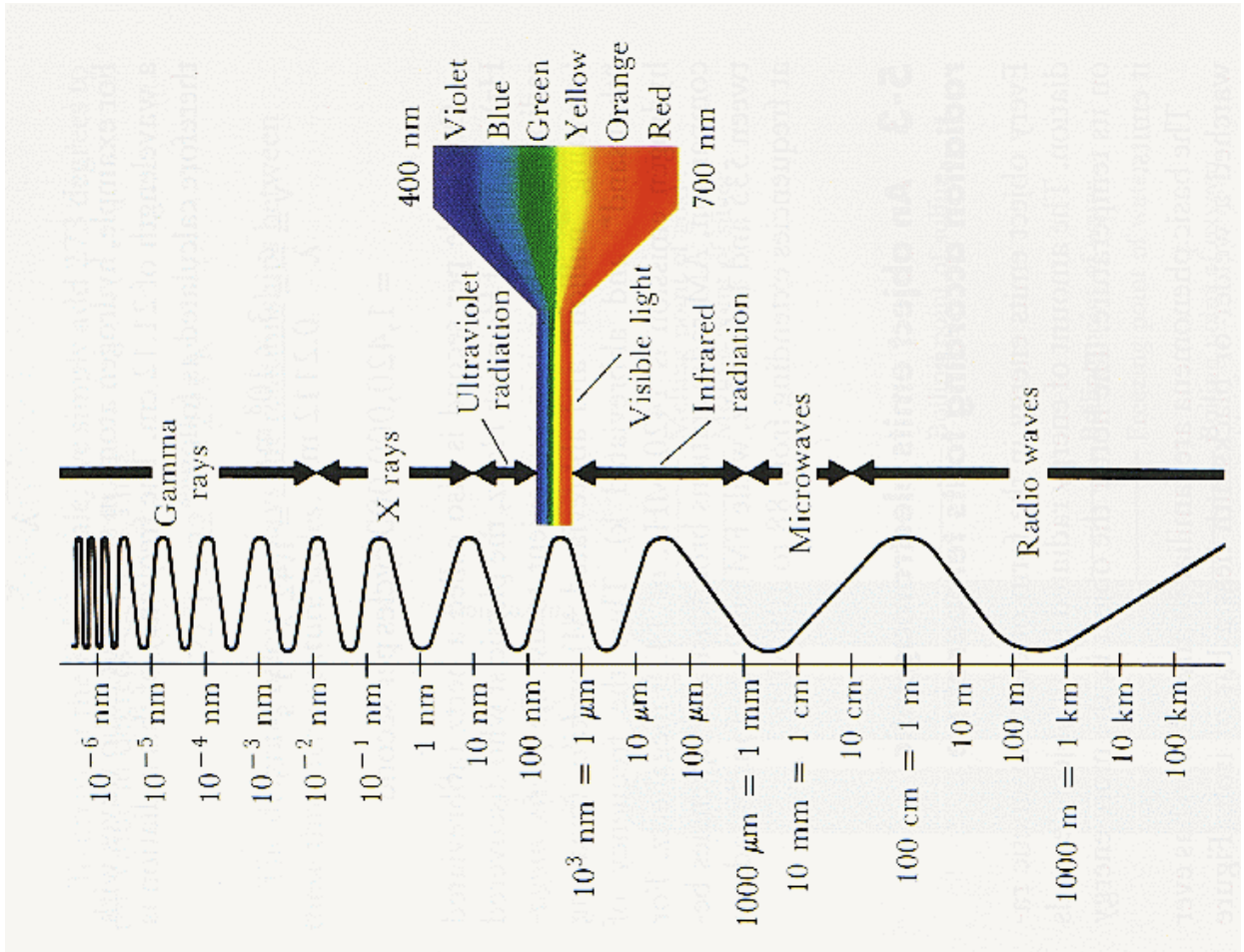






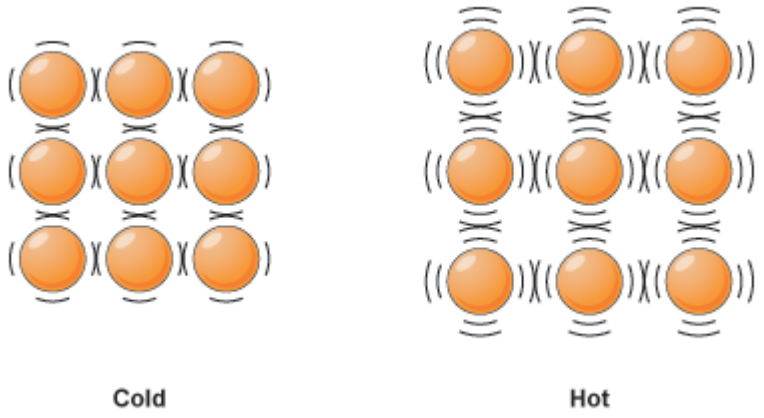


Electromagnetic Spectrum



Temperature and Heat

- Temperature = amount of kinetic energy of molecules!
- Heat: amount of thermal energy



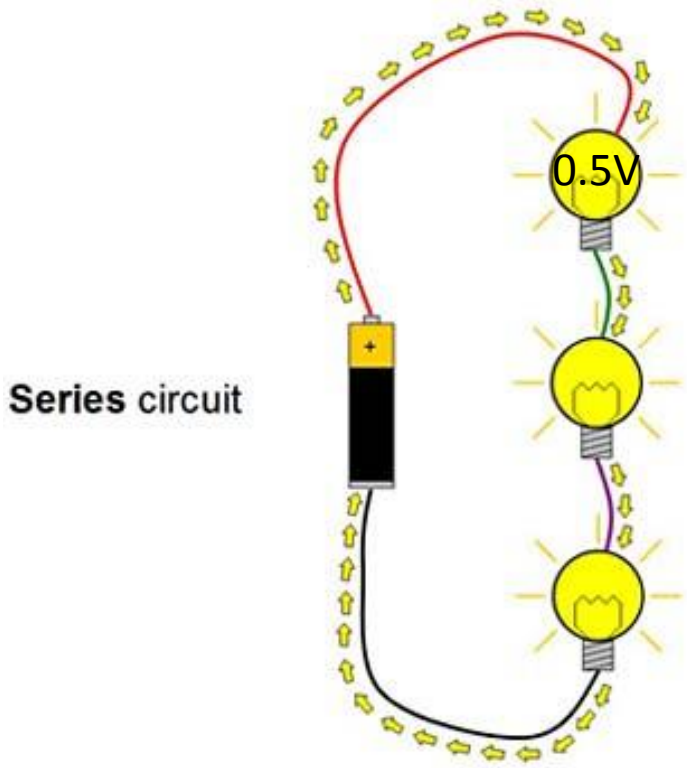
Gas Laws

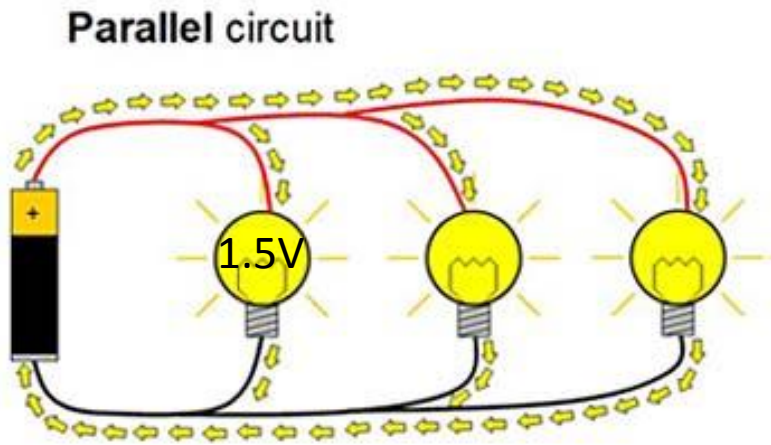
Table I
Gas Law Relationships

	Expression of gas laws	*Fixed values*	*Variable relationships*	*Form for calculations*
Boyles	PV = constant	n, T	Inverse	$P_1V_1 = P_2V_2$
Charles	V/T = constant	n, P	Direct	$V_1/T_1 = V_2/T_2$
"3rd Law"	P/T = constant	n, V	Direct	$P_1/T_1 = P_2/T_2$

Electric Circuits

- With 1.5V battery - Volts
  - Series/Share
  - Parallel/…Parties ?
- With 1.5V battery – Current
  - Series – same everywhere
  - Parallel – chooses based on path of least resistance

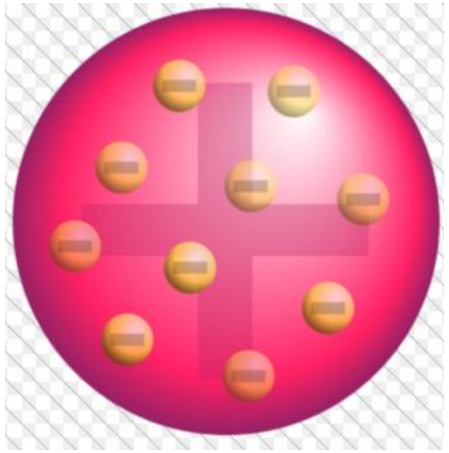




Atomic Theory & Contributing Scientists

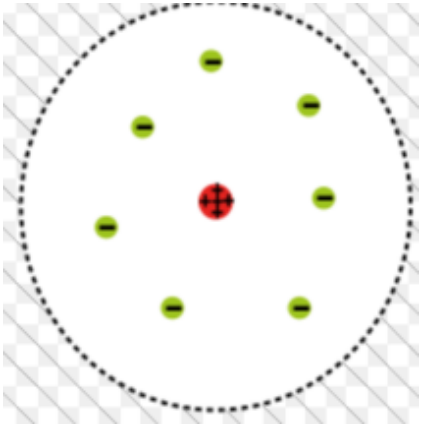
- Thomas

"plum pudding model"



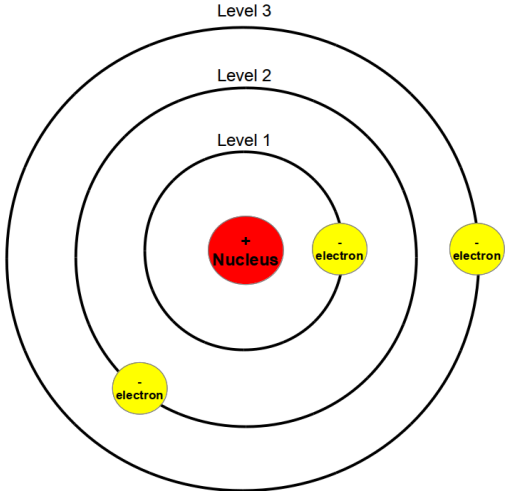
Rutherford

Gold foil experiment

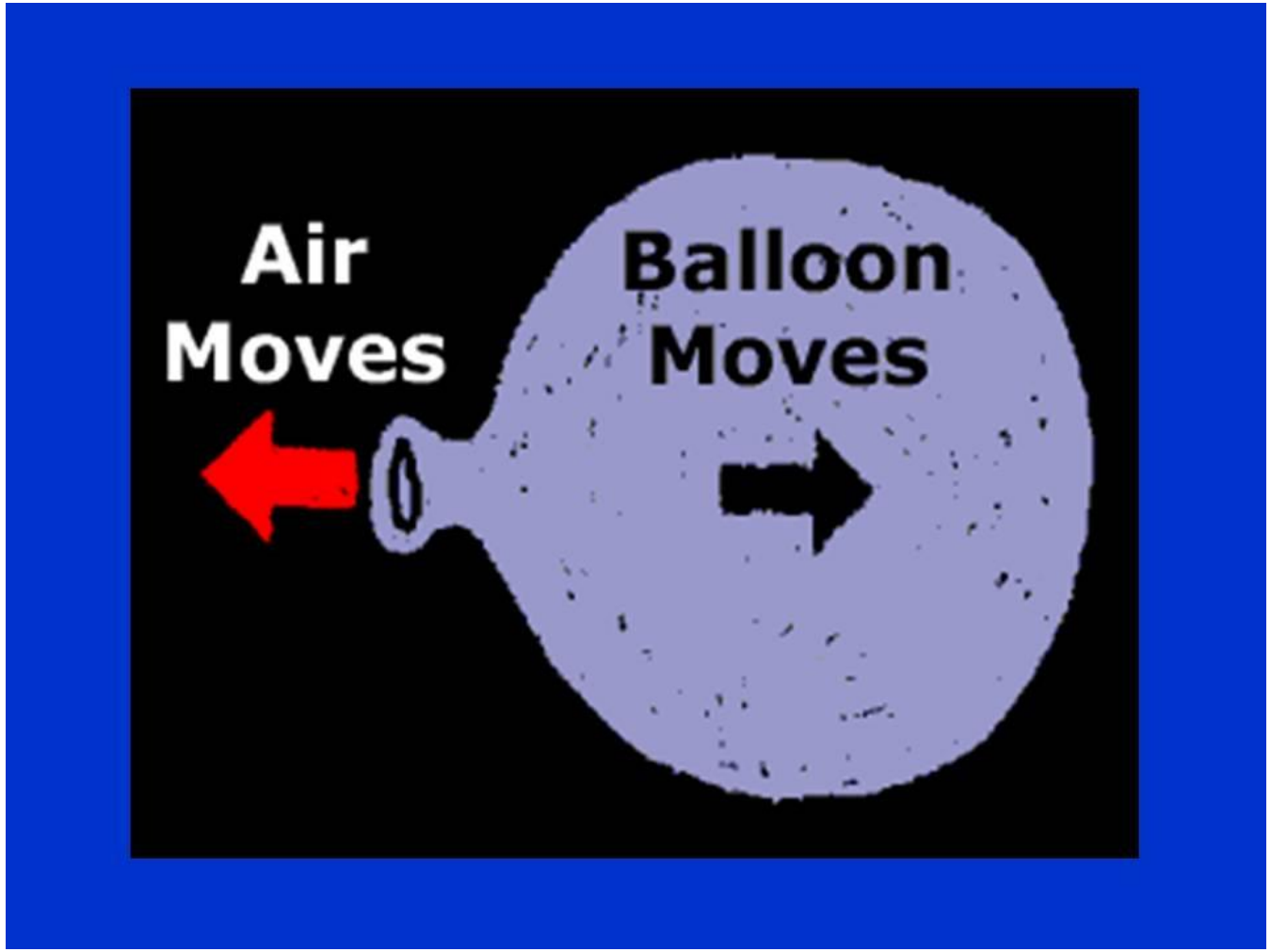


Bohr

e- orbitals



Which of Newtons three laws does this represent?



Read the following five statements and determine whether or not they represent examples of work.

Statement
A teacher applies a force to a wall and becomes exhausted.
A book falls off a table and free falls to the ground.
A waiter carries a tray full of meals above his head by one arm straight across the room at constant speed. (Careful! This is a very difficult question that will be discussed in more detail later.)
A rocket accelerates through space.

Practice Questions

$H_2 + O_2 \rightarrow 2\ H_2O$ is a

a. synthesis reaction
b. decomposition reaction
c. single displacement reaction
d. double displacement reaction
e. combustion reaction

Practice Questions

- $Zn(OH)_2 + HCl \rightarrow ZnCl_2 + H_2O$ is a :

a. synthesis reaction
b. decomposition reaction
c. single displacement reaction
d. double displacement reaction
e. combustion reaction

- How would you describe the nucleus?

A) dense, positively charged

B) mostly empty space, positively charged

C) tiny, negatively charged

D) dense, negatively charged

- Every atom of a given element has the same number of

A) protons.

B) Neutrons

C) electrons

D) isotopes.

- Which statement is true about isotopes of the same element?
- A) They have the same number of protons.
- B) They have the same number of neutrons.
- C) They have a different atomic number.
- D) They have the same mass.

- Which of the following has the least mass in an atom?

A) nucleus

B) Proton

C) neutron

D) electron

- A carbon atom with 6 protons, 6 electrons, and 6 neutrons would have a mass number of

A) 6.

B) 18.

C) 12.

D) 15

- The elements in each vertical column on the periodic table usually have similar properties and are called a(n)
- A) period. B) group. C) element. D) property

- Which of the following statements describes most metals?
- A) They are easily shattered.
- B) They are gases at room temperature.
- C) They are dull.
- D) They are good conductors of electric current

- Most of the elements in the periodic table are
- A) metals. B) metalloids. C) gases. D) nonmetals.

- A horizontal row on the periodic table is called a(n)

A) group. B) family. C) period. D) atomic number