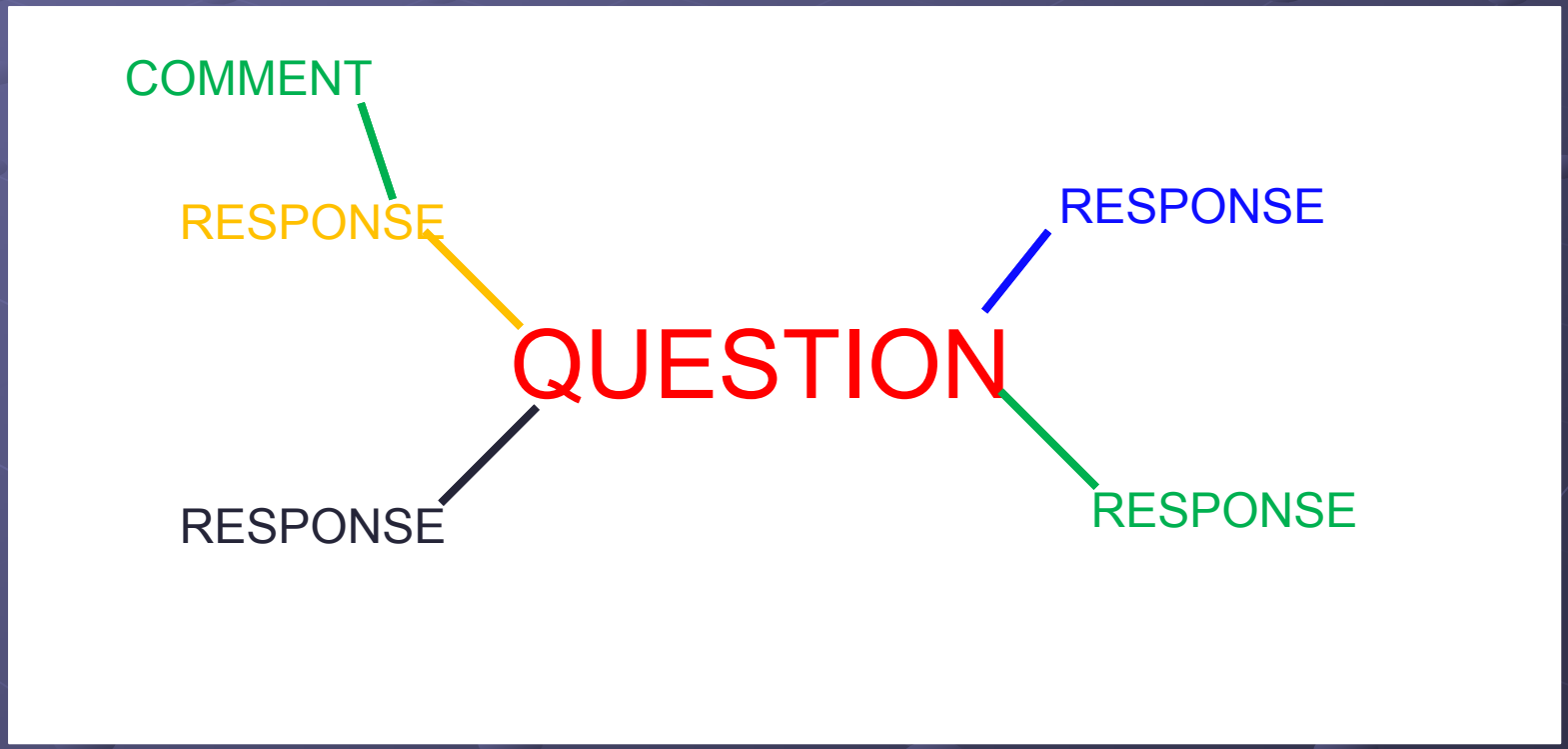
Potential and Kinetic Energy

Opener

- Go get a Whiteboard and Markers
- This Activity is called “Marker Talk”
  - You may only use your marker to discuss your ideas and opinions about the given question
  - No talking is allowed

- On the next two slides, write down the question given to you in the middle of the whiteboard
- Use your markers to comment on the question like this



QUESTION #1

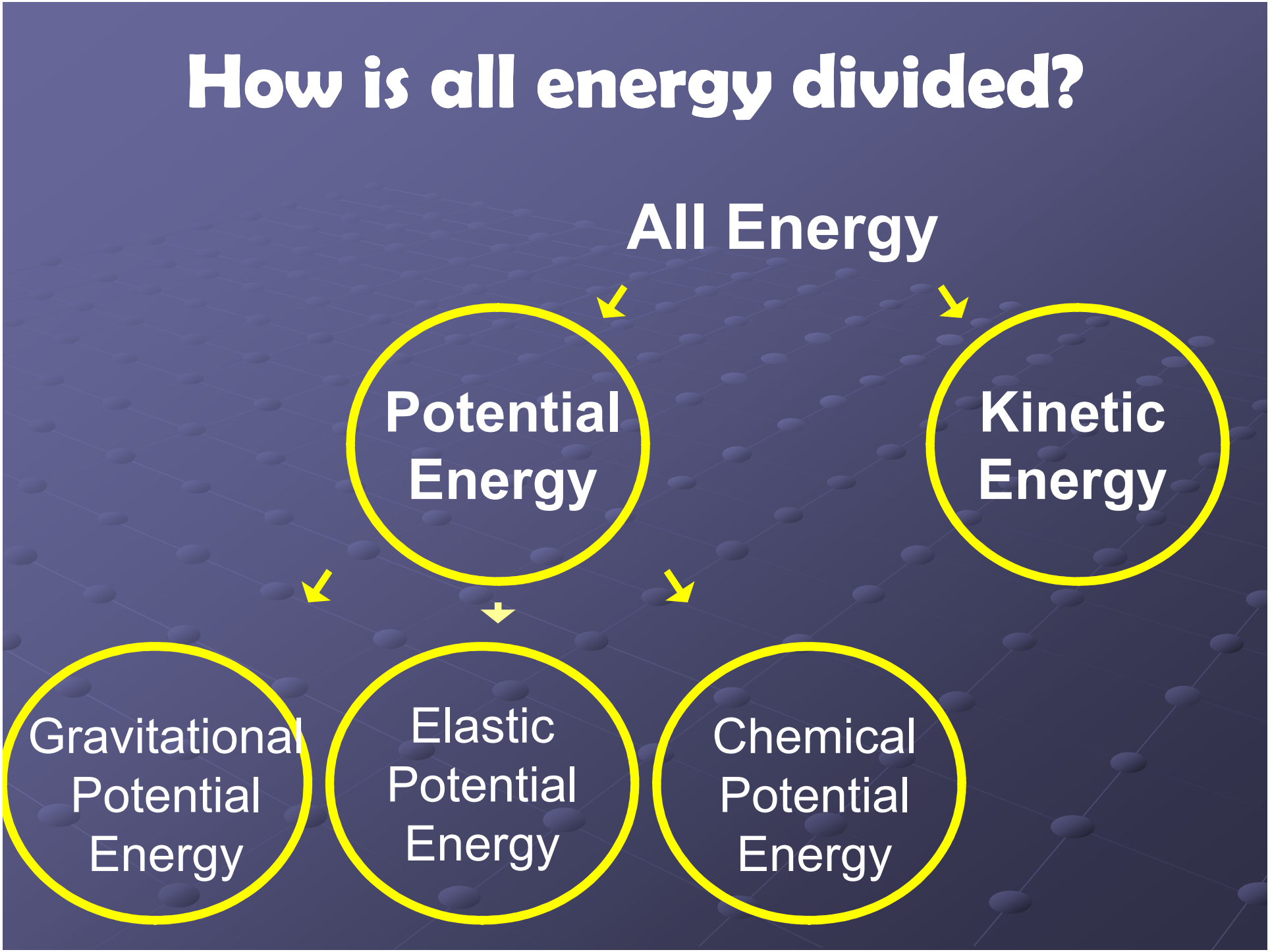
- What are 5 things that use energy that you could not live without?

QUESTION #2

- Do you think that we, as Americans, are addicted to energy?

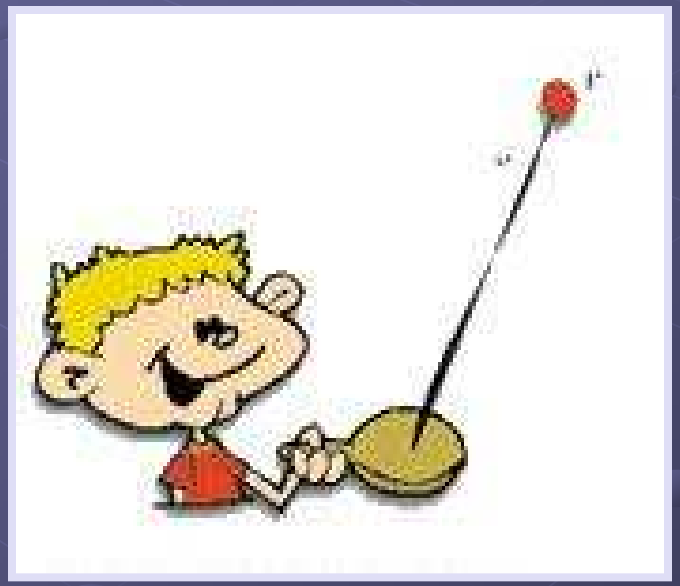
Vocabulary

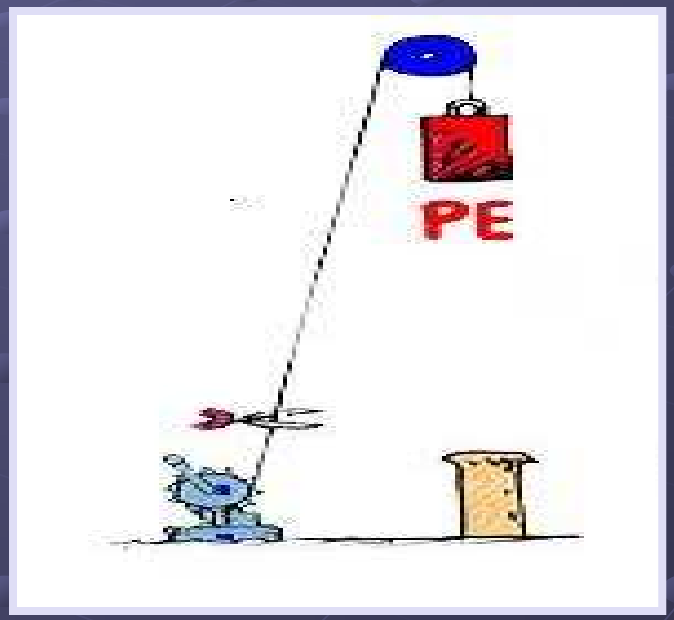
How is all energy divided?



What is Potential Energy?

- Energy that is stored and waiting to be used later





What is Gravitational Potential Energy?

- Potential energy due to an object's position

Gravitational Potential Energy and GERC

Gravitational Potential Energy is the product of an object's mass, gravity and height from a given position

PE = Potential Energy (Joules)

m = mass (kg)

g = gravity (9.8 m/s^2 on Earth)

h = height (m)

$$E_p = m * g * h$$

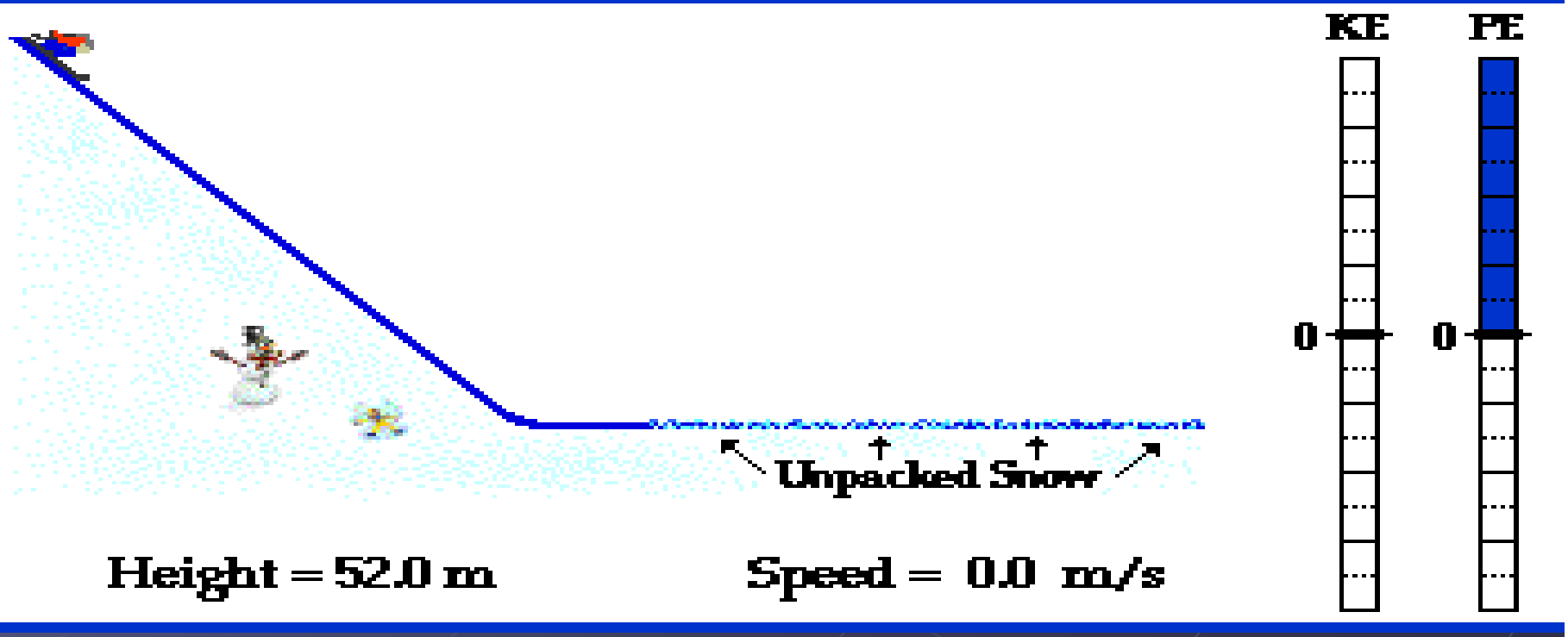
$$m = \frac{E_p}{gh}$$

$$h = \frac{E_p}{mg}$$

A 4 kg object is 5 meters off of the ground. How much potential energy does the object have?

What is Kinetic Energy?

- Energy an object has due to its motion



Kinetic Energy and GERC

Energy an object has due to it's motion

$$E_k = .5\ m * v^2$$

KE = Kinetic Energy (Joules)

m = mass (kg)

v = velocity (m/s)

$$m = \frac{E_k}{\frac{1}{2}v^2}$$

$$v = \sqrt{\frac{2E_k}{m}}$$

A 10 kg object is travelling 3 m/s. How much kinetic energy does it have?

Types of Energy

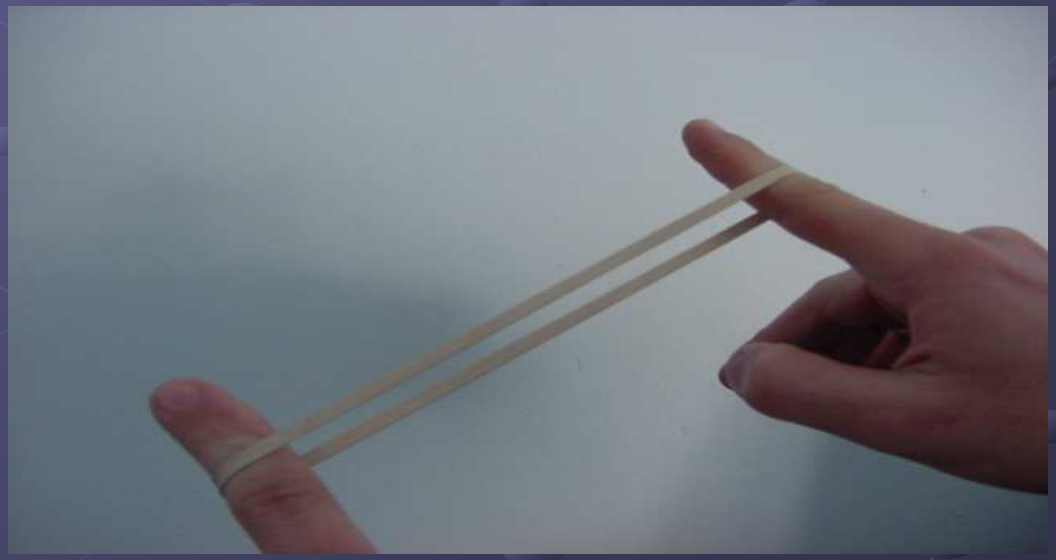
- There are many types of energy
- All of them can create forces or motion
- Often there are many types of energy present
- Energy can be converted from one form to another

Thermal Energy

- Heat Energy
  - A product of most other forms of energy
  - Can be created by friction

Mechanical Energy

- Any kind of Kinetic or Potential Energy
  - Elastic Potential Energy
    - **Potential energy due compression or expansion of an elastic object.**

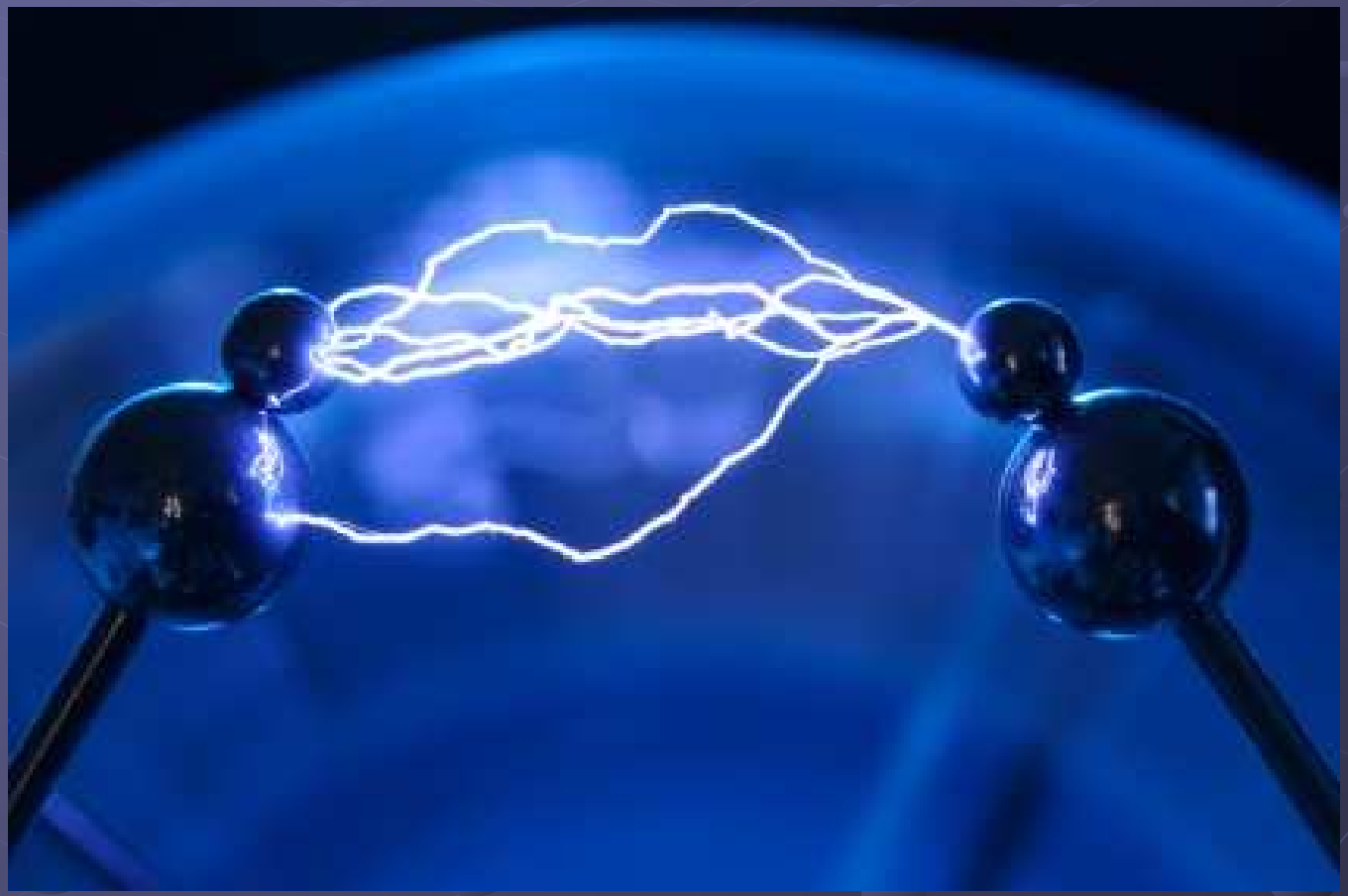


What is Chemical Potential Energy?

- Potential energy stored within the chemical bonds of an object

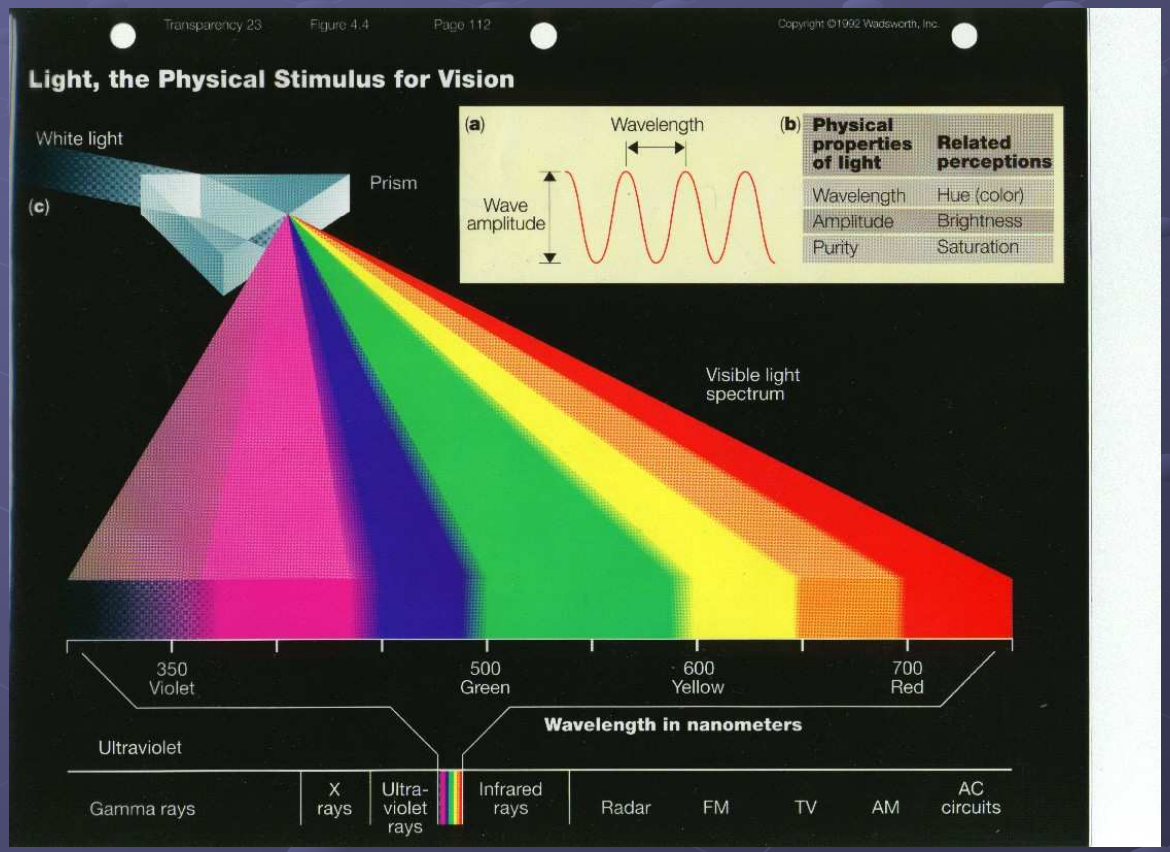
Electrical Energy

- Energy of moving electrons



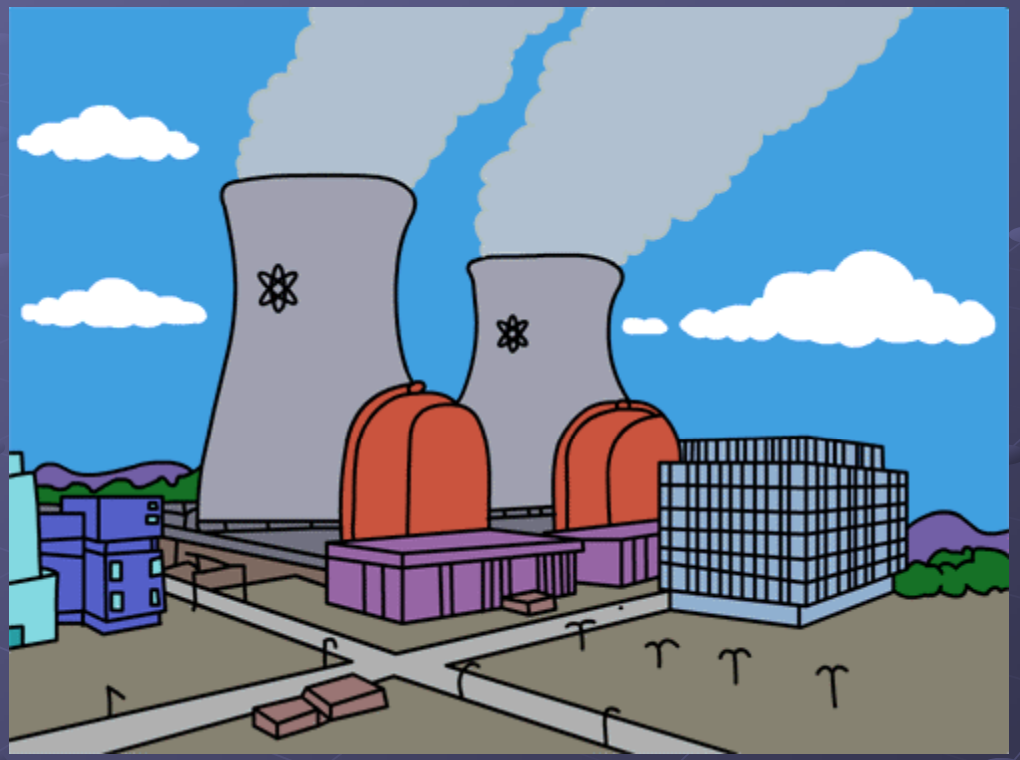
Radiant Energy

- Light Energy



Nuclear Energy

- Energy from nuclear reactions
  - Fission
    - Splitting the atom
  - Fusion
    - Combining atoms



Classwork

- Potential and Kinetic Energy Worksheet
- Next Class-Work and Power