**Energy Notes**

**Energy** – the ability to cause change or to do work.

I. Types of Energy

A. **Kinetic Energy (KE)** – the energy that an object has due to

the object’s motion

1. As the **speed** of the object ↑, the KE of the object ↑.

2. As the **mass** of the object ↑, the KE of the object ↑.

3. The formula for KE

KE = ½ x mass x velocity2 or mass x velocity2

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4. A change in velocity affects KE more than a change in mass.

5. Since energy is used to do work, it is measured in

Joules also.

J = kg x m2/s2

B. **Thermal Energy** – heat changes the motion (KE) of the

molecules or atoms in a substance

1. As heat **↑**, the motion of the molecules ↑ and vice versa.

C. **Sound Energy** – is carried by the movement of vibrating

molecules.

D. **Electric Energy** – energy that is carried by the flow of

electrons from one atom to another.

E. **Potential Energy (PE)** – energy that is stored and has the

potential to be released.

1. **Gravitational PE (GPE)** – energy stored by objects

that are above the earth’s surface.

a. As the object’s height ↑, the GPE ↑.

b. As the mass of the object ↑, the GPE ↑.

GPE = mass x acceleration due to gravity x height

(9.8 m/s2)

2. **Elastic PE** – energy stored in objects that are stretched

(i.e. rubber band, balloons) or that are compressed (i.e.

springs).

3. **Chemical PE** – energy is stored in the chemical bonds that hold the elements in a substance together.

a. Usually, when new bonds are formed, energy is stored.

b. When bonds are broken, energy is given off.

F. **Light Energy** – Light energy is carried in rays that can

travel across air or empty space and is called **radiant**

**energy**.

G. **Nuclear Energy** – the energy is stored in the forces that

hold the nucleus of the atom together.

1. It is very powerful, but difficult to release.

**Two Types of Nuclear Energy**

**Fusion** – 2 hydrogen atoms are fused into helium.

**Fission** – 1 uranium atom is broken down into 2

smaller atoms.