**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.