

I. Energy

- ability to do work.
- Work- when and object changes is position or form.

A. The Law of conservation of energy:

- Energy cannot be created or destroyed. It can change forms.

B. Two types of Energy:

1. Mechanical– energy that needs matter to travel through. (Sound, chemical, electrical)
2. Electromagnetical– Energy that can travel through empty space. (Light and Radiation)

C. Types of Energy Transfer:

1. Conduction- Energy Transfer through direct contact.
2. Convection– Energy transfer through flowing matter. (Wind, water)
3. Radiation– Energy transfer through waves. (light, radio waves, x-rays, ultraviolet, infrared)

II. Kinetic and Potential Energy:**A. Kinetic– The energy of motion. Anything moving has kinetic energy.**

1. Rule #1: An object in motion tends to stay in motion unless acted on by an outside force. (gravity, friction, air resistance, or opposing force.)
2. Rule #2: An object with more mass and greater speed has more kinetic energy.

B. Potential Energy – Any energy in a stored form.

1. Gravitational potential energy-determined by an object's mass and distance to fall.
2. Elastic Potential energy- Energy related to the shape of an object and its ability to stretch or squeeze back to its original position.
3. Stored Chemical energy – Energy that is stored in chemical bonds. (food, fuel, batteries)

III. Energy Changing Forms:**A. Common forms of energy:**

1. Kinetic – moving objects
2. Potential – Stored energy
3. Mechanical – energy of an object moving. (motor, running, gears, flowing, hitting.)
4. chemical – energy stored in chemical bonds. (food, fuel, explosives, batteries)
5. light – energy traveling in waves of photons.
6. heat – energy in molecules moving or vibrating quickly. (friction, air resistance)
7. Sound – energy in the form of vibrations of air.
8. electrical – energy of flowing electrons.

B. Examples of changing forms:

1. kinetic - potential (hitting a baseball into the air)
2. potential – kinetic (A boulder rolling down a hill)
3. chemical – mechanical (Burning the gas in your car to make it go fast)
4. chemical – light (using the batteries in your flashlight to light up your path in the woods.)
5. chemical – heat (Burning wood to keep you warm on a cold night.)
6. kinetic – electrical (A windmill turning flowing wind into electricity.)
7. electrical – sound (plugging in a radio and turning it on. Electricity moves the speaker parts.)
8. potential – electrical (Using a battery to run anything.)