ENERGY

WHAT IS ENERGY?

What does energy mean to you?

http://www.pbslearningmedia.org/resource/nvel.sci.phy.defined/energy-defined/

ENERGY

- Energy – The ability to do work or cause change
  - Produce warmth, light, sound, movement, growth…
- Is neither created nor destroyed
  - Just transformed or converted from one form to another
- Potential Energy – Stored energy
- Kinetic Energy – Energy of motion

POTENTIAL ENERGY

- Energy of position
  - Water behind a dam
  - Hammer over a nail
  - Cup on the edge of the countertop

KINETIC ENERGY

- Energy of motion
- The form capable of doing work
  - Flowing water
  - A falling hammer
  - The cup falling

FORMS OF ENERGY

FORMS OF ENERGY

1. Mechanical Energy
2. Thermal (heat) Energy
3. Electromagnetic Energy
4. Electrical Energy
5. Nuclear Energy
6. Chemical Energy

1. MECHANICAL ENERGY

- Energy associated with the motion of an object
  - Cars moving down a road
  - A frog dancing on a lily pad
  - A bowling ball hitting pins

2. THERMAL ENERGY

- Heat energy
- The heat energy of an object determines how active its atoms are
  - Hot objects have rapidly moving atoms
  - Cooler objects have slow atoms

3. ELECTROMAGNETIC ENERGY

- Energy that travels in waves
  - Gamma rays
  - X-rays
  - UV rays
  - Visible light
  - Infrared rays
  - Microwaves
  - Radio bands

4. ELECTRICAL ENERGY

- Energy caused by the movement of electrons
  - Static shock
  - Lightening
  - Computers / TVs / radios
  - Light bulbs

5. NUCLEAR ENERGY

- Energy stored in the nucleus of an atom
  - Stars
  - Nuclear power plants
  - Nuclear bombs

6. CHEMICAL ENERGY

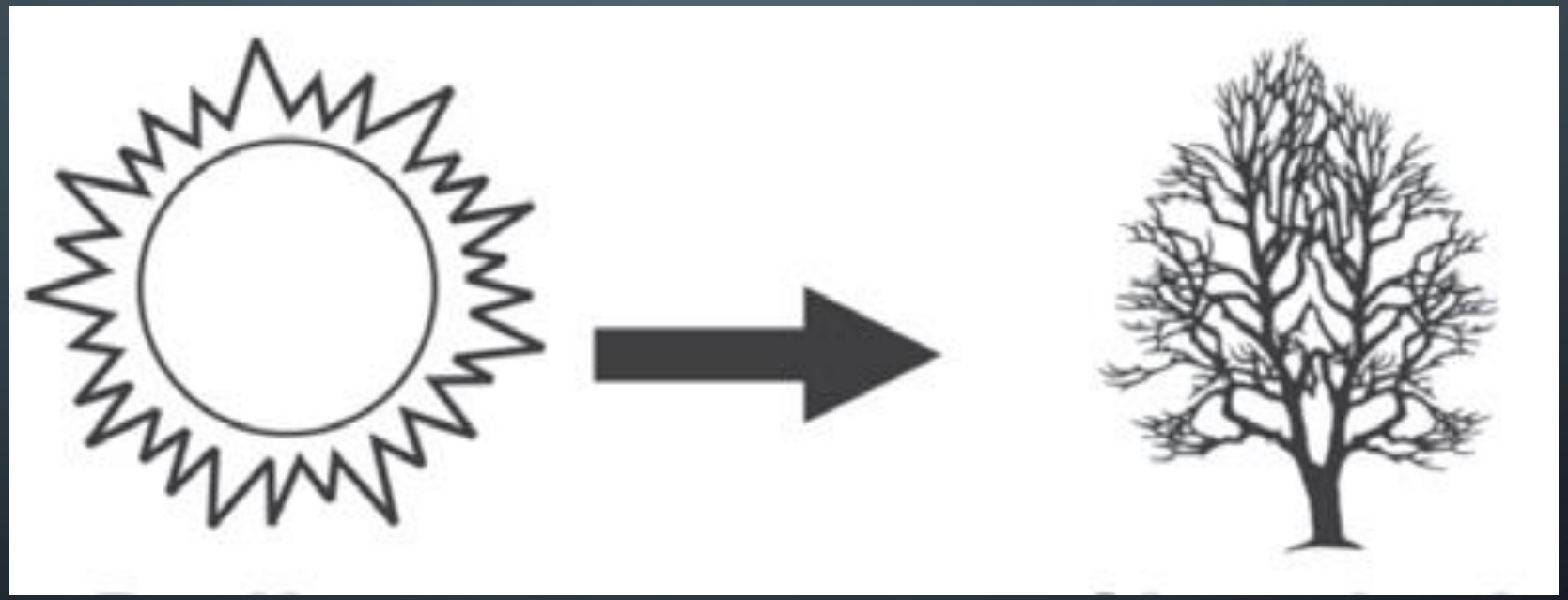
- Potential energy stored in a chemical bond
  - Food
  - Fire cracker
  - Stomach
  - Battery

ENERGY TRANSFERRED

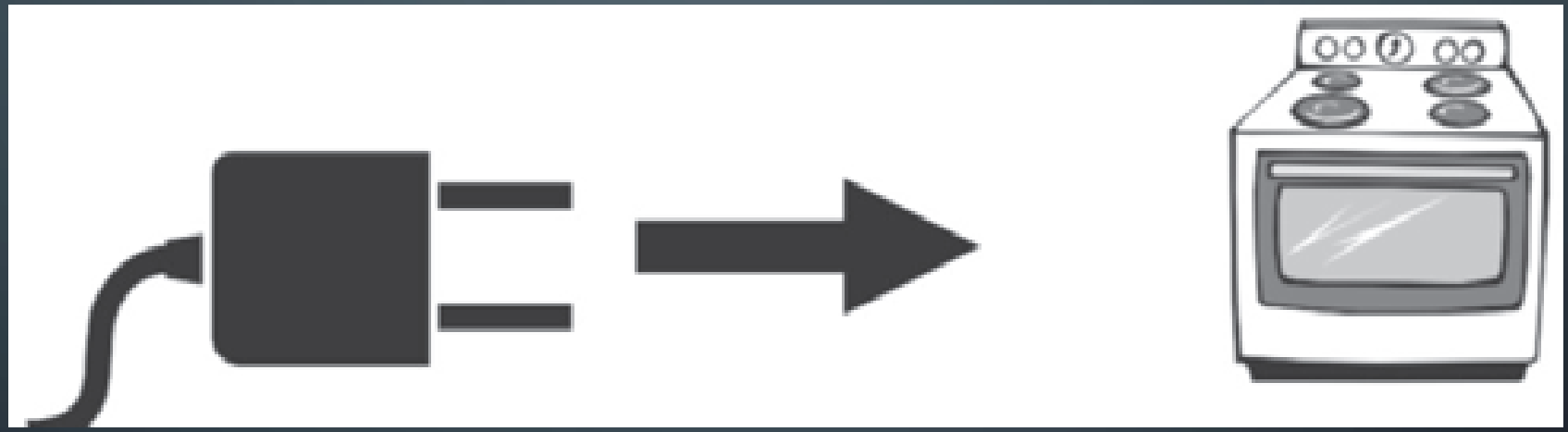
- Energy is neither created nor destroyed, only changed
  - Law of Conservation of Energy
  - First Law of Thermodynamics
- No energy transfer is 100% efficient so some energy is lost to the environment but that does not mean it was destroyed, just lost

QUIZ TIME!

NAME THE TRANSFER



NAME THE TRANSFER



Electrical energy is transported to your house through power lines.

When you plug an electric fan to a power outlet, electrical energy is transform into what type of energy?

MECHANICAL ENERGY

What type of energy cooks food in a microwave oven?

ELECTROMAGNETIC ENERGY

What type of energy is the spinning plate inside of a microwave oven?

MECHANICAL ENERGY

WHAT TYPES OF ENERGY ARE SHOWN BELOW?

Mechanical and Thermal Energy

(Don't forget friction)

WHAT TYPE OF ENERGY IS SHOWN BELOW?

Chemical Energy

WHAT TYPES OF ENERGY ARE SHOWN BELOW?

Electrical, Mechanical and Electromagnetic Energy

YOUR TURN

- With your table, come up with a description of how mechanical energy could be transformed to electrical energy.

- With your table, come up with a description of how electrical energy could be transformed to thermal energy.