Energy Unit Study Guide

Concept or Term	√	Definition or Explanation
Energy		Energy is defined as the ability to do work or cause change
Kinetic Energy		Energy of a moving object
Mechanical		Energy of an object due to its movement
Electrical		Energy of electrons moving in one way in wire
Sound		Energy of compression waves moving through a substance
Electromagnetic		Electromagnetic radiation (like light waves, microwaves, radio waves, x-rays, etc.) that move in longitudinal waves
Thermal		Energy caused by its atoms and molecules moving and vibrating within the substance
Potential Energy		Stored energy in an object
Gravitational		The energy an object or substance has because of its vertical position (or height)
Nuclear		Energy stored in the nucleus of an atom which is released if the atom is broken apart
Chemical		Energy stored in the bonds between atoms which are released if the bonds are broken by a chemical reaction
Conduction		Movement of heat from one SOLID to another, from warmer to colder
Convection		Transfer of heat from one place to another in LIQUIDS or GASES
Radiation		Heat transfer from fire or the sun in the form of wave energy being emitted
Renewable energy		Renewable energy sources come from nature and can be replenished in less than 100 years
Solar		Solar energy converts the sun's light into electricity with the use of solar panels and the photovoltaic effect.
Wind		Used to generate electricity through wind turbines, or to pump water with a windmill.
Biomass		Material that can be burned to create heat or converted to be burned as fuels.
Hydroelectric power		The water flows through a turbine to spin a generator, which produces electricity through the electromagnetic effect.
Geothermal		Heat within the earth that can be used as steam to heat items or to spin a generator.
Nonrenewable energy		These sources cannot be replenished and are usually used up completely.
Coal		Sedimentary rock with a high amount of carbon and hydrocarbons.
Oil		Liquid form made from prehistoric plants and animals.
Natural gas		Occurs deep beneath the earth's surface.
Nuclear		Energy can be released when those bonds are broken in a process called nuclear fission.
Electromagnetic effect		The effect that occurs in copper wire when wrapped in spinning magnets, which produces an electric current.
Turbine generator		A device with blades, which is turned by a force. The mechanical energy of the spinning turbine is converted into electricity by a generator through the electromagnetic effect.
Photovoltaic effect		The process by which radiant (light) energy is changed into electrical energy by exciting electrons out of the material they are in to become a current.

Review Questions

1. What is the difference between conduction, convection, and radiation?
2. Give a definition and an example of both kinetic and potential energy.
3. Describe how chemical energy can be transformed into mechanical energy.
4. Describe how electrical energy can be transformed into sound energy.
5. Categorize all the energy sources as either renewable or nonrenewable.
6. Explain two differences between renewable and nonrenewable energy.
7. Explain how the electromagnetic effect produces electricity from a turbine generator.
8. Explain how the photovoltaic effect produces electricity.
9. How can water be used to create electricity?
10. Explain two advantages and two environmental problems from using fossil fuels.
11. How are uranium and coal similar? How are they different?
12. Describe what a current is and give an example of how it is created.
13. List and describe four **forms** of energy.