Name _____

Matter & Energy (p. 77 – 81)

I. Kinetic Theory

p. 77

1. **Define the term kinetic theory.** (Camp Randall Stadium – Wisconsin)

   Kinetic Theory – matter is made up of atoms + molecules (atoms + molecules act like tiny particles that are always in motion)

2. **The higher the temperature of the substance is, the** faster **the particles move.** (Water vs. Ice)

3. **More massive particles move** slower **than less massive ones (at the same temperature).** (Baseball Vs. Softball)

II. States Of Matter

p. 78

1. **List the four states of matter.**

   1. Solid 2. Liquid 3. Gas 4. Plasma

2. **Complete the following table.**

	States Of Matter				
	State Of Matter	**Type Of Packing**	**Shape**	**Volume**	**Kinetic Energy (1 = Greatest)**
Movie Theater Audience →	**Solid**	Tightly Packed	Definite	Definite	1
Students In Hallway →	**Liquid**	Tightly Packed	Shape of Container	Definite	2
Billiards →	**Gas**	Loosely Packed	Shape Of Container	Shape of Container	3
	Plasma	Loosely Packed	Irregular	Irregular	4

Bose-Einstein Condensate
- state of matter that exists at extremely low temperatures
Absolute Zero
- 273.15 °C
(Groups of atoms behave as single particles)

3. **List two examples of fluids.**

   1. Gases 2. Liquids

4. **Define the term plasma.**

   Plasma – state of matter that does not have a definite shape or volume

5. 99 **% of known matter in the universe is made up of plasma.**

6. **List four examples of plasma.**

   1. Stars 2. Lightning 3. Neon + Fluorescent Lights 4. Auroras

Name _____

II. Energy's Role

1. Define the term energy.

Energy – ability to change or move matter (ability to do work)

2. Match the types of energy with their definitions. (Not in the book.)

1. C. Elastic	A. Energy stored in chemical bonds.
2. A. Chemical	B. Reaction in which mass is converted into energy.
3. F. Gravitational	C. Energy stored in something that can stretch or compress.
4. G. Photosynthetic	D. Differences in electric fields.
5. B. Nuclear	E. Energy with electric and magnetic properties.
6. D. Electric Potential	F. Energy stored in objects due to position above surface.
7. E. Electromagnetic	G. Process in which sunlight is converted into energy.

3. Define the term temperature.

p. 80

Temperature – measure of the average kinetic energy of particles in an object

Thermal Expansion
Solid: Concrete on highways
Liquid: Alcohol in thermometers
Gas: Hot-air balloons

4. The more kinetic energy the particles of an object have, the higher **the temperature of the object.**

5. When the temperature of a substance is lowered, the particles will vibrate more slowly.

Circle One : True False

6. Define the term thermal energy.

Thermal Energy – the total kinetic energy of the particles that make up a substance

7. Why does the cooler ocean have more thermal energy than a hotter tea kettle?

- Even though the tea kettle steam has a higher kinetic energy, the ocean has many more particles and therefore a greater total kinetic energy.