Energy & Specific Heat Guided Notes

Name: _____ Per: _____

Energy

- _____- ability to do work or transfer heat
- Two Types of Energy

1. _____ – energy of motion
    - KE = _____
    - m=_____and v=_____
    - Atoms and molecules have kinetic energy
2. _____ – due to the position or composition of an object
    - _____- stored energy in the bonds of the atoms and molecules

Temperature vs. Heat

- _____- Average KE of molecules (how fast the molecules are moving)
- _____– energy transferred from a warmer object to a cooler one
    - measures the molecules ability to do work
- _____- system absorbs heat (surroundings feel cool)
- _____- system gives off heat (surroundings feel hot)

Energy Units

- joule – SI unit for energy
- calorie – non-SI unit used for energy
    - 1cal=_____ (exactly)
        - How many calories are in 75 joules?
- Calorie (capitalized) – the nutritional unit for energy
    - 1Cal=_____cal=_____kcal

Conversion Practice

- I had a granola bar this morning. It had 140 Calories.

  calories?

  joules?

  kilojoules?

Law of Conservation of Energy

- _____ can be neither _____ nor _____

Heat lost by the reaction (system) = Heat gained by the surroundings (water & universe)

- system: _____
- surroundings: _____

Specific Heat

defined as the amount of _____ required to _____ the temperature of 1 g of substance by _____

Equation: _____

- q= _____
- m= _____
- c = specific heat constant (J/g◦C) pg 520
- ΔT = _____ (◦C)

Substance	Specific Heat J/g◦C @ 25◦C
Water (l) (liquid)	
Water (s) (ice)	
Water (g) (steam)	

Practice Problems

- How much heat energy is needed to raise the temperature of a 55g sample of water from 22.4 ◦C to 94.6 ◦C?

- If 980 kJ of energy are added to 6.2L of water at 25◦C, what will the final temperature of the water be?

Check For Understanding

- How much heat energy is needed to raise the temperature of a 55 g sample of aluminum from 22.4 ◦C to 94.6 ◦C? (specific heat value on pg. 520)