Thermal Energy Study Guide

Name: _____ Hour_____

Goal 1

Define the following in your own words:

1. Conductor -

   Two examples -

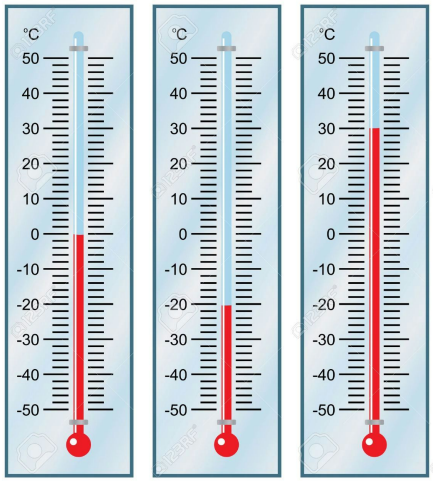
2. Insulator -

   Two examples -

Goal 2

1. A balloon was blown up and placed in the freezer. When it was taken out of the freezer, it expanded. Which of the following explains the changes in kinetic and thermal energy when the balloon was taken out of the freezer?
   a. Kinetic energy increases, thermal energy increases
   b. Kinetic energy decreases, thermal energy increases
   c. Kinetic energy increases, thermal energy decreases
   d. Kinetic energy decreases, thermal energy decreases

2. In which picture are the molecules moving the slowest? How do you know?



3. At what temperature does water freeze?

_____°F, _____°C, _____K

4. At what temperature does water boil?

_____°F, _____°C, _____K

5. What temperature is absolute zero?

_____°F, _____°C, _____K

6. What is room temperature?

_____°F, _____°C, _____K

7. Describe what is happening to the kinetic energy of the particles in water as it goes from 40 degrees Celsius to -2 degrees Celsius.

8. Describe what is happening to the kinetic energy of the particles in water as it goes from 80 degrees Celsius to 103 degrees Celsius.

9. In an experiment, one thermometer was placed under a light blue t-shirt and one thermometer was placed under a dark navy t-shirt. A heat lamp was then set up to shine on both shirts. The temperature was measured and recorded for 2 hours. Describe or illustrate what happens to the temperature of each thermometer. Explain WHY this happens.

Goal 3

1. You have iced tea in a glass you are outside on a hot day. Describe the direction of heat transfer.

2. You have a cup of hot cocoa in the classroom. Describe the direction of heat transfer. When does the transfer of thermal energy stop?

3. Define EQUILIBRIUM as it refers to thermal energy:

Goal 4

Identify which of the three ways heat is transferred in each example below (Conduction, Convection, Radiation). Explain WHY!

1. Holding cold snow in my hand. _____

_____

2. Getting too hot sitting next to the fire. _____

_____

3. A hot tube is heated through this process. _____

_____

Fill in the blank with Conduction, Convection and Radiation below.

4. Near the ceiling of a room the air is warmer. The warm air rises because of _____.

5. A student holds the back of his hand near an iron to see if it is hot. Heat is transferred to his hand by _____.

6. A huge rock at the state park gets so hot during the day that you can't sit on it from _____.

7. You lay on that same rock at night so that you can keep warm by _____.

8. Give an example of **convection** you see in your everyday life. Explain how heat is transferred in your example. Include density in your explanation. *Answer in complete sentences*.

Goal 5

1. What happens to the melting point/freezing point of water when you add salt?

2. Describe the reason for pouring salt on the roads in the winter.

3. Why do we use salt to make ice cream?