Name: KEY\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_

Review for Summative: LT 2.6, 2.7

The quiz will be **Monday, 10/28 (A day) and Tuesday, 10/29 (B day).**

**Practice Problems:** There is 1-2 of each type of question you will be expected to do on the quiz.

1. Fill in the blanks using the words provided: Using the analyzing temperature data activity from the first day: Water has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (higher/lower) specific heat capacity than rocks or soil do. Because of this, it takes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (more/less) energy to heat up water than soil. Therefore, coastal communities need \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (more/less) to change the temperature, which keeps their climate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hotter/colder) in the summer and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hotter/colder) in the winter.
2. Something that conducts heat well is a \_\_\_\_\_\_conductor\_\_\_\_\_\_\_\_\_\_\_\_. Something that does not conduct heat well is an \_\_\_\_\_\_\_\_insulator\_\_\_\_\_\_\_\_\_\_\_.
3. If I want to keep my coffee hot, is it better to put it in a cup made of metal, which is a good conductor, or a cup made of plastic, which is an insulator? Explain.

A plastic cup will keep the coffee hotter because it’s an insulator. Insulators block the transfer of heat/energy. A metal coffee cup would quickly absorb the heat from the hot coffee 🡪 cold coffee ☹

1. If I add 45 cal of heat to glass (specific heat of 0.50 cal/g˚C) and 45 cal of heat to wood (specific heat 0.40 cal/g˚C), which will have the greater temperature change (assuming mass is equal)? Why?

The wood will experience a higher temperature change because it has a lower specific heat. Specific heat is how much energy (J) it takes to raise the temperature of 1 g by 1˚C. Thus, substances with lower specific heats require less energy to raise the temperature.

1. Steel has a specific heat of 0.11 cal/g˚C. Granite has a specific heat of 0.06 cal/g˚C. If we have the same mass, which one needs more energy to increase its temperature by 15 ˚C? Why.

Steel will require more energy to increase the temperature because steel has a higher specific heat. Substances with higher specific heats require more energy to increase their temperature.

1. A 25.0 g piece of metal at 100 ˚C is placed in 25.0 g of water at 20 ˚C. The metal’s specific heat is 0.9 J/g˚C and water’s specific heat is 4.184 J/g˚C.
   1. Which way does energy flow? Metal 🡪 water
   2. How will the final temperature of the water and the metal compare? They will be equal
   3. What will have a greater temperature change, the metal or the water? Why? The metal will experience a larger temperature change because it has a lower specific heat.
2. Water has a specific heat of 4.184 J/g °C, while ice has a specific heat of 2.11 J/g °C. If 10 g of each were to cool by 10 °C, which one would release more heat? Justify your answer.

Water would release more heat because it has a higher specific heat. Substances with higher specific heat hold more heat at a given temperature than substances with lower specific heat.

1. How much heat is required to raise the temperature of 67.0g of water by 40.3 °C? The specific heat of H2O is 4.184J/g°C) **[Ans: 11300 J]**

Q = 67.0 g (4.184 J/g°C) (40.3°C)

1. What is the mass of a sample of metal that is heated from 58.8°C to 88.9°C with a specific heat of 0.4494 J/g°C, if Q = 4500.0 J? **[Ans: 333 g]**

m = Q = 4500.0 J

C(Tf – Ti) (0.4494)(88.9 – 58.8)

1. Calculate the heat capacity of a piece of wood if 1500.0 g of the wood absorbs 6.75×104 joules of heat, and its temperature changes from 32°C to 57°C. **[Ans: 1.8 J/g°C]**

C = Q = 67500 J

m (Tf – Ti) 1500 (57 – 32)

1. To what temperature will a 50.0 g piece of glass raise if it absorbs 5275 joules of heat and its specific heat capacity is 0.50 J/g°C? The initial temperature of the glass is 20.0°C. **[Ans: 230 °C]**

5275 J = 50 g (0.50) (Tf – 20)

5275/25 = Tf – 20

Tf = 211 + 20