

Name:

Date:

1. What is the difference between temperature and heat?

2. _____ is energy in motion. _____ is stored energy and
_____ be measured. _____ can be measured.

3. When you heat a substance and the temperature rises, how much it rises depends upon
its _____.

4. The definition of specific heat capacity is the amount of _____ required to do what?

5. You can touch the aluminum pan of a TV dinner soon after it has been taken from the oven, but you will burn your hand if you touch the food it contains. Explain.

6. Why doesn't the temperature of water (for example) continually increase as it is heated?

questions continued on next page

Unit 8D Practice Problems 2 Heat Calculations

7. What equations must be used to calculate the heat associated with a phase change?

Why can't the specific heat equation be used? _____

Use these charts as needed in the following calculations: You will need your own paper to complete your calculations.

Substance	Specific Heat (J/g °C)
H ₂ O(l)	4.184
H ₂ O(steam)	2.02
Al(s)	0.89
Fe(s)	0.45

Water
$\Delta H_{\text{fus}} = 334 \text{ J/g}$
$\Delta H_{\text{vap}} = 2260 \text{ J/g}$

8. How much heat is required to warm 275 g of water from 76 °C to 87 °C?
9. PCl₃ is a compound used to manufacture pesticides. A reaction requires that 96.7 g of PCl₃ be raised from 31.7 °C to 69.2 °C. How much energy will this require given that the specific heat of PCl₃ is 0.874 J/g °C?
10. A quantity of water is heated from 25.0 °C to 36.4 °C by absorbing 325 J of heat energy. What is the mass of the water?
11. A 500. g sample of an unknown metal releases 6.4×10^2 J as it cools from 55.0 °C to 25.0 °C. What is the specific heat of the sample?

12. In a household radiator, 1000.g of steam at 100. °C condenses (changes from gas to liquid). How much heat is released?
13. How much heat is necessary to change a 52.0 g sample of water at 33.0 °C into steam at 110.0 °C? This problem requires several steps since temperature changes and a phase change takes place. Use the hints to solve.
- Solve for the heat required to increase the water temperature from 33.0° C to 100.0 °C. Stop here because the water will change phase at this temperature.
 - Solve for the heat required to change the water into steam (no change in temp).
 - Calculate the heat required to change the temperature of the steam from 100.0 °C to 110.0 °C.
 - To get the heat required for the whole process, _____ the calculated heats from above.