Specific Heat Worksheet
$(m)(\Delta T)(C_{sp})=Q$

1. _____ is the amount of energy that it takes to raise the temperature of 1 gram of a substance by 1 degree kelvin

2. _____ is the temperature at which all molecular motion ceases

3. _____ process is a change in matter in which energy is absorbed

4. _____ process is a change in matter in which energy is released

5. What is the specific heat of a substance that absorbs 2500 joules of heat when a sample of 100 g of the substance increases in temperature from 10 °C to 70°C?

6. If 200 grams of water is to be heated from 24.0°C to 100.0°C to make a cup of tea, how much heat must be added? The specific heat of water is 4.18 J/g·C

7. How many grams of water would require 2200 joules of heat to raise its temperature from 34°C to 100°C? The specific heat of water is 4.18 J/g·C

8. A block of aluminum weighing 140 g is cooled from 98.4°C to 62.2°C with the release of 1080 joules of heat. From this data, calculate the specific heat of aluminum.

9. 100.0 mL of 4.0°C water is heated until its temperature is 37°C. If the specific heat of water is 4.18 J/g°C, calculate the amount of heat energy needed to cause this rise in temperature.

10. A total of 54.0 joules of heat are absorbed as 58.3 g of lead is heated from 12.0°C to 42.0°C. From these data, what is the specific heat of lead?

11. The specific heat of wood is 2.03 J/g·°C. How much heat is needed to convert 550 g of wood at -15.0°C to 10.0°C?

12. What is the total amount of heat needed to change 2.25 kg of silver at 0.0°C to 200.0°C? The specific heat of silver is 0.129 J/g·°C

13. Granite has a specific heat of 800 J/g·°C. What mass of granite is needed to store 150,000 J of heat if the temperature of the granite is to be increased by 15.5°C?

14. A 55 kg block of metal has an original temperature of 15.0°C and 0.45 J/g·°C. What will be the final temperature of this metal if 450 J of heat energy are added?

15. Object A specific heat is 2.45 J/g·°C and object B specific heat is 0.82 J/g·°C. Which object will heat up faster if they have the same mass and equal amount of heat is applied? Explain why.

16. When a 120 g sample of aluminum (Al) absorbs 9612 J of energy, its temperature increases from 25°C to 115°C. Find the specific heat of aluminum.

17. 25.0 g of mercury is heated from 25°C to 155°C, and absorbs 455 joules of heat in the process. Calculate the specific heat capacity of mercury.

18. What is the specific heat capacity of silver metal if 55.00 g of the metal absorbs 47.3 **calories** of heat and the temperature rises 15.0°C?

19. If a sample of chloroform is initially at 25°C, what is its final temperature if 150.0 g of chloroform absorbs 1.0 **kilojoules** of heat, and the specific heat of chloroform is 0.96 J/g°C?

Temperature Conversion

$$K = °C + 273 \qquad °F = (9/5 \text{ x } °C) + 32$$
$$°C = K - 273 \qquad °C = 5/9 \ (°F - 32)$$

Convert the following to Celsius

1) 32 K _____   4) 1020 K _____   7) 350° F _____

2) 45 K _____   5) 200° F _____   8) 0° K _____

3) 70 K _____   6) 273 K _____   9) 100° F _____

Convert the following to Kelvin

10) 0° F _____   13) 70° F _____

11) -50° C _____   14) -150° C _____

12) 90° C _____   15) 400° F _____