P.S. Physics Chapter 6 **Specific Heat Questions** Name_____

$Q = m \times \Delta T \times C$

1. In the change in thermal energy equation, what does *Q* represent?

2. In the change in thermal energy equation, what does *m* represent?

3. In the change in thermal energy equation, what does the Δ mean?

4. What is the definition of specific heat?

5. Which object will take in more heat, a silver spoon or a wooden spoon? Explain.

Some common specific heats:		
Air	***C* (J/g^{o}C)**	***C* (J/kg^{o}C)**
Aluminum	1.01	1010
Copper	0.902	902
Glass	0.385	385
Gold	0.837	837
Ice	0.129	129
Iron	2.11	2110
Mercury	0.450	450
Water	0.140	140
Air	4.184	4184

Complete the problems. Show all work and use the correct units.

1. A 142 g sample of an unknown substance was heated from 15^{o}C to 30^{o}C. The substance absorbed 275 joules of energy.
   a. What is the specific heat of this substance?

   b. What is the substance?

2. If the temperature of 28 g of ethanol increases from 15^{o}C to 65.5 ^{o}C, how much heat was absorbed by the ethanol? (specific heat ethanol = 2.44 J/g^{o}C)

3. How much heat must be absorbed by 375 g of water to raise its temperature by 25° C?

4. What mass of water can be heated from 25.0° C to 50.0° C by the addition of 2825 J?

5. A 25.0 g sample of material is heated from 30.0 °C to 50.0 °C. In the process, it absorbs 505 J of energy as heat.
   a. What is the specific heat of the sample?

   b. What is the substance?

6. How much energy is needed to raise the temperature of 5.00 g of iron by 30.0 °C?

7. Energy in the amount of 460 J is added to a 25.0 g sample of water at a temperature of 15.0 °C. What will be the final temperature?

8. How much heat is required to raise the temperature of 3.5 grams of water from 12°C to 35°C?

9. How much heat is needed to heat 20 grams of mercury form 20°C to 150°C?

10. A 300 gram bar of aluminum has to be heated from 25°C to 75°C. How many joules are needed to achieve this temperature increase?

11. The temperature of a 100 gram piece of copper is reduced from 103°C to 3°C. How much heat is lost?

12. How much heat is needed to heat 25 grams of iron from 0°C to 110°C?

13. A 20 gram substance absorbs 385 J of heat to change the temperature from 100°C to 150°C.
   a. What is the specific heat of the substance?

   b. What is the substance?

14. A 100 gram sample of mercury is heated form 0°C to a certain temperature. If 322 J of heat is needed to do this, what is the final temperature of the sample of lead?

15. A sample of iron is heated from 85°C to 100°C and it takes 202.5 J to do this. What is the mass of the iron sample?

16. How much heat is required to raise the temperature of 150 grams of aluminum from 345°C to 400°C?

17. A 400 gram substance absorbs 50,208 J of heat to change the temperature form 30°C to 60°C.
   a. What is the specific heat of the substance?

   b. What is the substance?