**Specific Heat and Phase Change Worksheet**

Hf for water = 334 J/g Hv for water = 2260 J/g

q=Hm q=mcΔT c for water = 4.18 J/g°C

1. Calculate the amount of energy required to melt 112 grams of ice.
2. A 15.0 g bar of iron is cooled from 95.0 ̊C to 22.5 ̊C. Calculate the amount of energy released from the iron.

1. How much energy is required to cool 32.00 grams of water from 78°C to -6 °C?
2. If 3200 joules are absorbed by 21 grams of water whose initial temperature was 23°C, what was the final temperature of the water?
3. A 150.0 gram sample of an unknown metal at 75.0 ̊C is added to 150.0 grams of water at 15.0 ̊C. The temperature of the water changes to 18.3 ̊C. Calculate the specific heat of the unknown metal.

1. How much energy is released when 20.0 grams of water are frozen?

1. An unknown metal is heated from 15.2 ̊C to 43.9 ̊C. The amount of energy needed to heat 20.0 g of the substance is 126.3 J. What is the specific heat capacity of the substance?
2. Calculate the amount of energy released when 10.4 grams of water are heated from 37 ̊C to 190 ̊C.
3. A piece of lead with a mass of 51.36 grams was heated to 100.0 ̊C. It was quickly immersed in 10.0g of water that was at a temperature of 24.6 ̊C. The water and lead came to a temperature of 35.2 ̊C. What is the specific heat of lead?
4. What is the total energy change in kilojoules when 465 grams of water vapor is cooled from 149 ̊C to -43 ̊C.