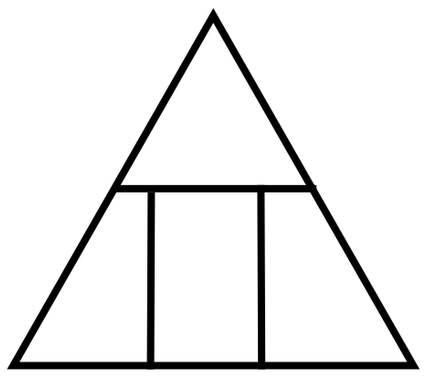
SPECIFIC HEAT WORKSHEETS

Name :

Date :

$Q = mc\Delta T$,
where Q= heat energy, m = mass, and ΔT = change in temp.Remember, ΔT = (Tfinal—Tinitial).



Show all work and proper units.

1. A 15.75-gpiece of iron absorbs 1086.75 joules of heat energy, and its temperature changes from 25°C to 175°C. Calculate the specific heat capacity of iron.

2. How many joules of heat are needed to raise the temperature of 10.0 g of aluminum from 22°C to 55°C, if the specific heat of aluminum is 0.90 J/g°C?

3. Calculate the specific heat capacity of a piece of wood if 1500.0 g of the wood absorbs 67,500 joules of heat, and its temperature changes from 32°C to 57°C.

4. 100.0 g 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.

5. Calculate the heat required to raise 0.6 Kg of sand from 30°C to 90°C? (Specific Heat of sand = 830 J/Kg°C)

KEY ANSWER

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$Q = mc\Delta T$,
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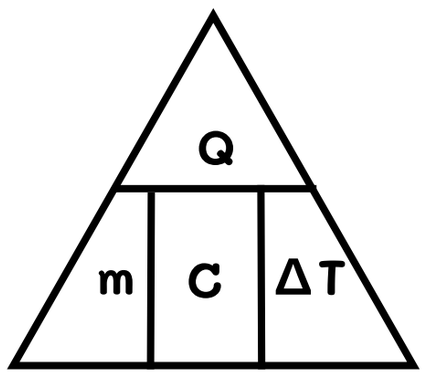

Show all work and proper units.

1. A 15.75-gpiece of iron absorbs 1086.75 joules of heat energy, and its temperature changes from 25°C to 175°C. Calculate the specific heat capacity of iron.
   c = q/(m.ΔT)
   c = 1086.75 J / (15.75 g × 150 °C)
   = 0.46 J/g °C

2. How many joules of heat are needed to raise the temperature of 10.0 g of aluminum from 22°C to 55°C, if the specific heat of aluminum is 0.90 J/g°C?
   q=mcΔT
   q= (10.0g)(0.90J/g°C)(33°C)
   q= 297 Joules

3. Calculate the specific heat capacity of a piece of wood if 1500.0 g of the wood absorbs 67,500 joules of heat, and its temperature changes from 32°C to 57°C.
   c = q/(m.ΔT)
   c = 67,500 J / (1500.0 g × 25 °C)
   = 1.8 J/g °C

4. 100.0 g 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.
   q=mcΔT
   q=(100 × 4.18 × 33) J
   q= 13,794 J

5. Calculate the heat required to raise 0.6 Kg of sand from 30°C to 90°C? (Specific Heat of sand = 830 J/Kg°C)
   q = mcΔT
   q =830 J/KgoC × 0.6 Kg × 60oC
   q = 29880 J.