# LESSON 2: Heat

## Primary Learning Goal

I can solve problems involving the transfer of thermal energy (heat).

Unit Analysis

Significant Figures

# Measuring Heat

## Example
What quantity of heat is transferred to the water in a kettle in one minute?

# Data

volume of water in the kettle, $V_{H2O}$ = 973 mL

initial temperature of the water, $T_1$ = 20.3°C

final temperature of the water, $T_2$ = 29.1°C

specific heat capacity for water, $c_w$ = 4.18 J g$^{-1}$ °C$^{-1}$

# Analysis

Calculate the quantity of heat, q, transferred to the water.

$q = m c \Delta T$

$= m_{H2O} \, c_{H2O} \, \Delta T_{H2O}$

$= m_{H2O} \, c_{H2O} \, (T_2 - T_1)$

$= (973 \, g)(4.18 \, Jg^{-1}{}^{\circ}C^{-1})(29.\underline{1}\,^{\circ}C - 20.\underline{3}\,^{\circ}C)$

$= (973 \, \cancel{g})(4.18 \, J\cancel{g^{-1}{}^{\circ}C^{-1}})(8.\underline{8}\,^{\circ}\cancel{C})$

$= \underline{3}5\,790.832 \, J$

## Conclusion

The heat transferred to the water in the kettle in one minute is 36 kJ.