BR: January 31st

Think about it Thursday.

Are temperature and heat the same thing?

Write for 2-3 minutes on whether you think they are the same or different. Explain your reasoning.

Jan 21-9:04 AM

Thursday, January 31st

Objective: Students be able to describe specific heat and perform calculations.

1. Bellringer
2. Guided Notes: Energy and Specific Heat
3. Hand Back Tests

DUE: none

HW: Specific Heat Practice & Test corrections

Jan 21-8:46 AM

Temp vs. Heat

temperature: average KE of molecules (how fast they're moving)

-- measured in **Celsius or Kelvin**

heat: energy transferred from a warmer object to a cooler one

-- measures ability to do work

-- measured in **Joules or Kilojoules**

endothermic: system absorbs heat (surroundings feel cool)

exothermic: system gives off heat (surroundings feel hot)

Jan 29-10:36 AM

ENERGY Units:

joule: SI unit for energy

4862 J x 1 kJ / 1000 J

* --- **1000** J = **1** kJ

calorie: non-SI unit for energy

* 1 cal = **4.184 Joules**

Calorie (capitalized): nutritional unit for energy

-- 1 Cal = **1000** cal = **1** kcal

Jan 29-10:36 AM

Law of Conservation of energy

First Law of Thermodynamics:

Energy *can be neither* created *nor* destroyed.

Heat lost by the reaction (system) = heat gained by the surroundings (universe)

system: set of parameters that work is being done to (thing that we are looking at)

surroundings: outside of the system (everything around the thing that we are looking at)

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Specific Heat

-- the amount of **energy** required to **raise** the temperature of 1 gram of a substance by **1°C**

EQUATION:

$$q = mc\Delta T$$

(delta = change in)

Q = heat (J) c = specific heat constant (J/g*°C)

m = mass (g) ΔT = change in temp (final temp - initial temp) °C

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Specific Heat

Substance	Specific Heat J/g◦C @ 25◦C
Water (l) (liquid)	4.184 *
Water (s) (ice)	2.03
Water (g) (steam)	2.01

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Practice q = mcΔT

How much heat energy is required to raise the temperature of a 55 g sample of water from 22.4 °C to 94.6 °C?

Q - ? J
m - 55 g
c - 4.184
ΔT - 94.6 - 22.4 = 72.2

$Q = (55)(4.184)(72.2)$
$= \frac{16,614.66 \text{ J}}{1000}$
$= 16.6 \text{ KJ}$

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Practice q = mcΔT

If 980 kJ of energy are added to 6.2 L of water at 25°C, what will the final temperature of water be?

Q = 980,000 J
m = 6200 g
c = 4.184
ΔT = (f - i)

* For Water:
1 L = 1000 mL
1mL = 1 gram

(f - 25) = 37.7 62.7 °C
+25 +25

980,000 = 6200(4.184)ΔT

$\frac{980,000}{25,940.8} = \frac{25,940.8\,\Delta T}{25,940.8}$

ΔT = 37.7

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