

Alice M.

Thermodynamics

9/17/26

• heat affects
different materials
in different ways

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Water: $\frac{1 \text{ gram}}{1 \text{ ml}}$

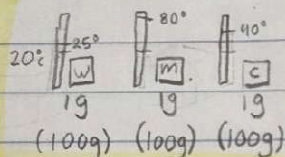
C_p = Specific heat capacity

$$\Delta Q = m \cdot \Delta T \cdot C_p \left(\frac{4.2 \text{ J}}{1^\circ \text{C}} \right)$$

mass

(1 ml = 1 gram) * only water

1 newton =
 $\frac{1}{4}$ pound



heat = energy measured
in joules

$$\frac{4.2 \text{ J}}{1^\circ \text{C}} = 4.2 \text{ joules per gram per celsius}$$

Q = energy (heat) - joules

m = mass - grams

ΔT = Celsius

$\frac{1}{27^\circ} \leftarrow 1 \text{ calorie}$
1 gram of H_2O

units of energy

- joule
 - calorie
 - Calorie
 - BTU
- (units for energy)

$$\text{water} = \frac{\text{force} \times \text{distance}}{1 \text{ meter}}$$

1,000 calories = 1 Calorie
* KiloCalorie

1 newton x
1 meter =
1 joule

BTU = British thermal units
* 16 oz

THERMO DYNAMICS

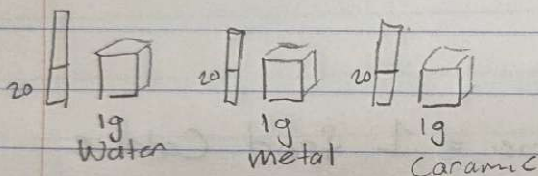
$$\Delta Q = m \cdot \Delta T \cdot C_p$$

(1 mL = 1 gram)

density = $\frac{\text{mass}}{\text{volume}}$

Water = 1 $\frac{\text{gram}}{\text{mL}}$

$C_p = ?$
Specific
Heat
Capacity



4.2 joules
raise 1g by 1 celcius

if you lit a match underneath all three, the matches would release the same amount of heat. However each substance would become a different temperature.

Different substances respond differently to heat.

Q = usually represents energy

m = mass

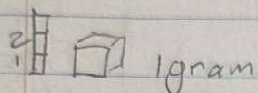
T = Temperature

- Joule
- calorie
- Calorie
- B.T.U



different units of
energy

calorie:



energy of one calorie is defined by how the temperature of the water behaves
heat required to be raised 1°Celsius

Calorie:

1,000 science calorie = 1 food Calorie

$$\text{Work} = \text{force} \times \text{distance}$$

★ newton

$$1\text{ n} \approx \frac{1}{4} \text{ lb}$$

B.T.U.:

British Thermal Unit

