7.2 Fluids & Density

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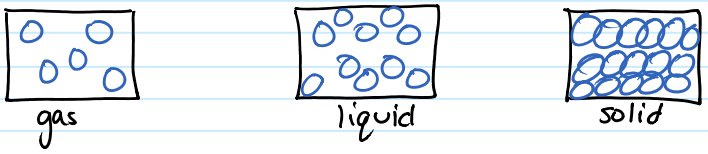
Fluid: - any form of matter that can flow
- liquids and gases are fluids since they do not have a fixed shape
- solids are NOT fluids

ex. lava, water, syrup

Density:

- the amount of **mass** for each unit of **volume**
- a way to measure how tightly packed the particles in an object



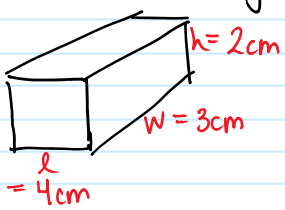
least dense → most dense

Measuring / Calculating Density

- both mass and volume are needed when calculating density

MASS: can be measured using a triple-beam balance (grams)

VOLUME: for objects that are block shaped
length x width x height

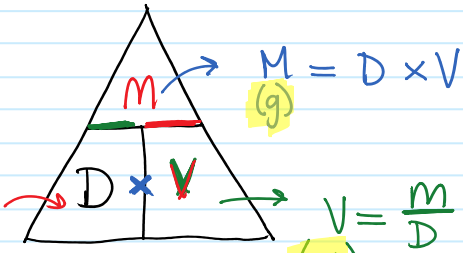


Volume = ?

$= l \times w \times h$
$= 4 \times 3 \times 2$
$= \boxed{24\ cm^3}$

→ for objects with irregular shapes we use displacement (indirectly)

→ for liquids → direct method using a graduated cylinder (mL)



(g/mL) or (g/cm³)

$D = \frac{mass}{volume}$

Ex #1

Calculate density of a $4\ cm^3$ rock that has a mass of 24g.

$$D = \frac{m}{V} = \frac{24\ g}{4\ cm^3} = \boxed{6\ g/cm^3}$$

* don't forget units !!

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don't forget units !!

Ex #2

Calculate density of a 5 mL sample of oil that has a mass of 4.5 g.

$$D = \frac{m}{V} = \frac{4.5\ g}{5\ mL} = \boxed{0.9\ g/mL}$$

Ex. #3

Calculate volume of a 6 g marble that has a density of 2.2 g/mL.

$$V = \frac{m}{D} = \frac{6\ g}{2.2\ g/mL} = \boxed{2.7\ mL}$$

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