

Density

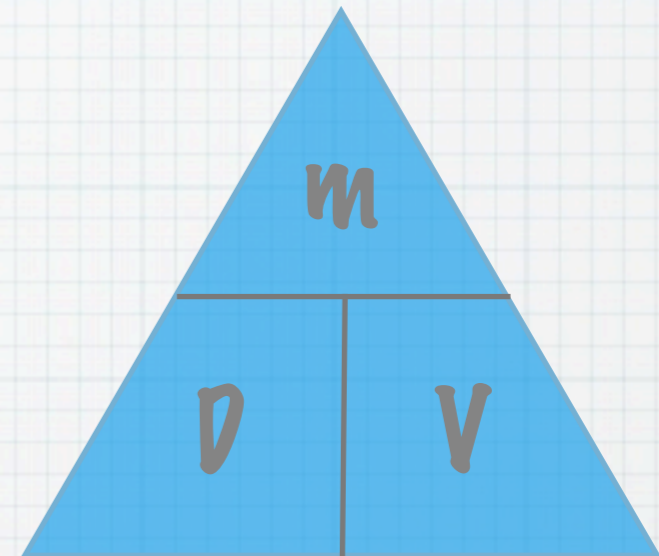
A closer look at physical properties

Density

- * Density is a physical property that can be useful if you have two substances that are similar in appearance and texture and you would like to identify them.

Density

* Density = $\frac{\text{mass}}{\text{volume}}$



Mass = kg or g

$$(1\text{kg} = 1000\text{g})$$

Volume = m^3 or cm^3 or mL

$$(1\text{mL} = 1\text{cm}^3)$$

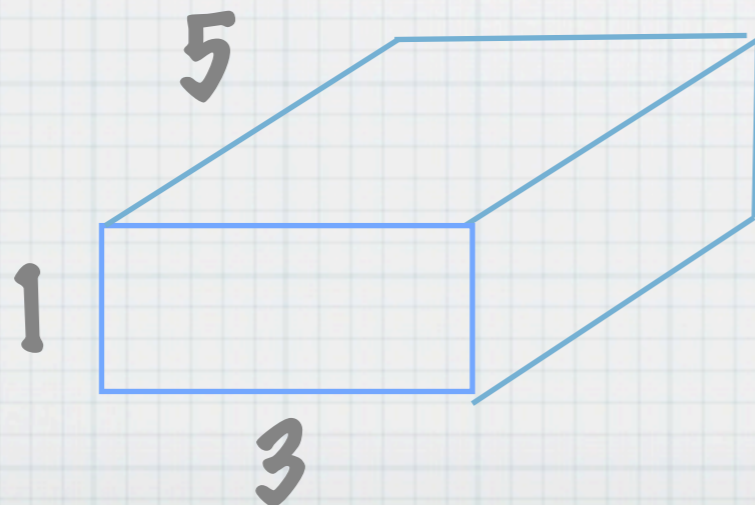
$$(1\text{cm}^3 = 1000000\text{m}^3)$$

Density

- * But how do you measure mass and volume?
- * i) Mass: Weight the object

Density

- * But how do you measure mass and volume?
- * i) Volume: Depends if it's regular or irregular
- * Regular: square or rectangle, measure with a ruler



$$V = l \times w \times h$$

$$V = 5 \times 3 \times 1$$

$$V = 15 \text{ cm}^3$$

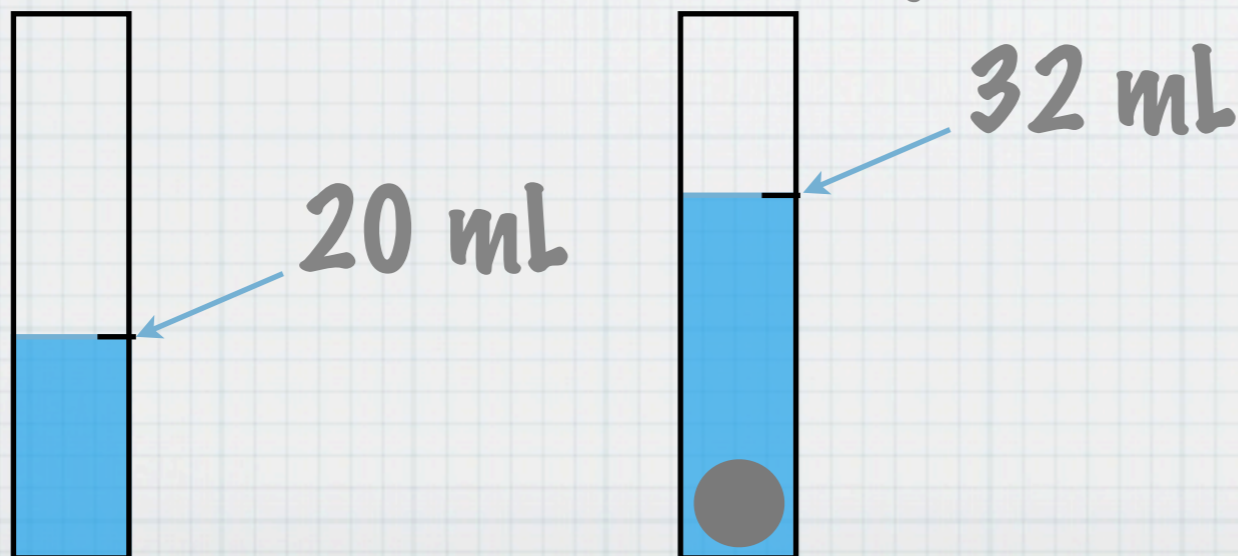
Density

* But how do you measure mass and volume?

* i) Volume: Depends if it's regular or irregular

* Irregular: two methods you could use

* a) Graduated cylinder

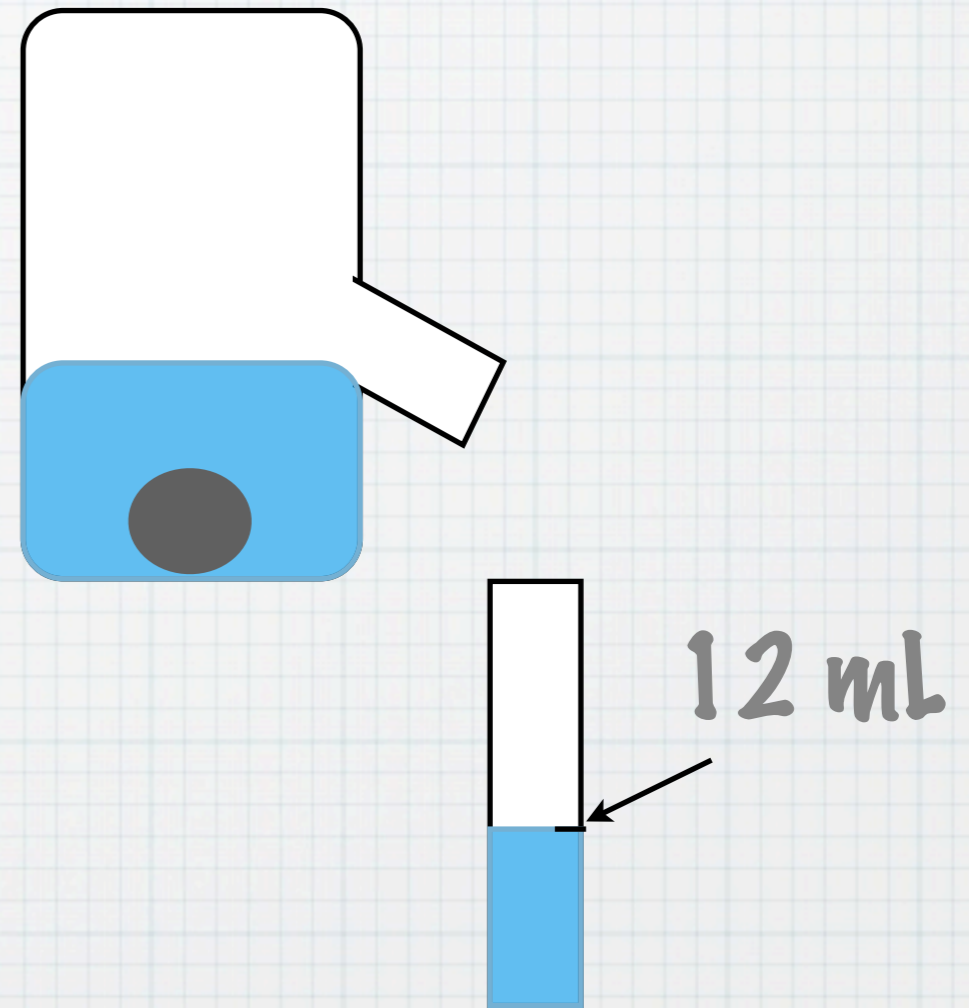


Volume of Object
= final volume - initial volume

$$= 32 \text{ ml} - 20 \text{ ml} \\ = 12 \text{ ml}$$

Density

- * b) Use an overflow can
 - * 1) Fill can to arm. Let excess water drip out
 - * 2) Gently place object in can, collect water that is displaced with graduated cylinder
 - * 3) Read graduated cylinder for volume

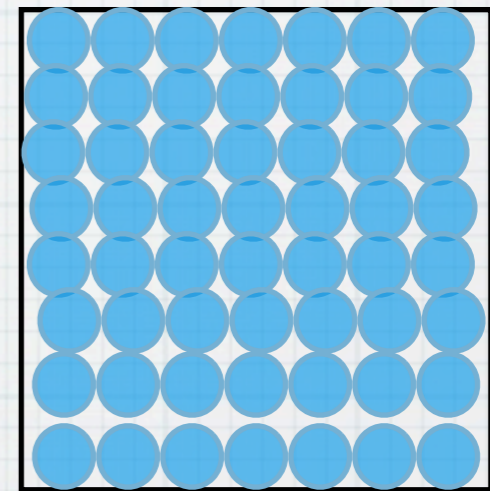
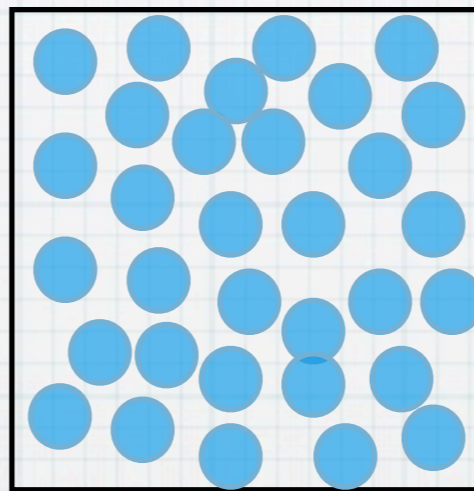
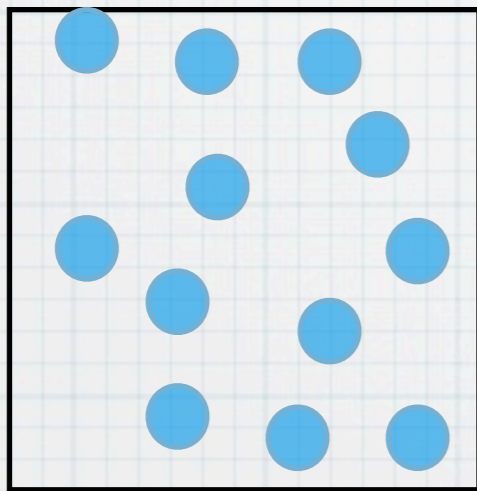


Density and Particle Theory

- * The particle theory states that matter is made up of particles packed together. Some particles can be packed closer than others.

Density and Particle Theory

- * The same number of particles may take up different volumes depending on how they are packed.



Which of the following is considered to be more dense?

How might this explain why a block of iron is heavier than a block of aluminum of the same size?