Density (notes)

- is a measure of how much matter (\_\_\_\_\_\_) is in a certain volume (\_\_\_\_\_\_\_\_\_\_\_\_\_).

- it can be calculated with the following mathematically expression

Density (\_\_\_\_) = \_\_\_\_\_\_\_\_\_\_\_\_

If you have two of the variables above you can figure out the missing variable using the triangle below

Therefore,

To find **mass**, M = D multiplied by V

To find **volume**, V = M divided by D

To find **density**, D = M divided by V

States of Matter and Density

- **Solids** have the highest density

ex. copper 8.9 g/cm3, aluminum 2.643 g/cm3 etc.

- **Liquids** have densities in between solids and gases

ex. water 1.0 g/cm3, gasoline 0.7 g/cm3

- **Gases** have the lowest density

ex. air 0.0012929 g/cm3, helium 0.00018 g/cm3 etc.

Density and Different Substances

**- When comparing substances (assuming equal mass) the following can be said,**

* Objects with lower densities will have larger volumes
* Objects with higher densities will have smaller volumes

ex. 10g of Alcohol will take up much more space (higher volume) than 10g of water because alcohol has a lower density

**- When comparing substances (assuming equal volume) the following can be said,**

* Objects with lower densities will have smaller masses
* Objects with higher densities will have larger masses

ex. 10ml copper will be heavier (higher mass) than 10ml of aluminum because copper has a higher density

Examples

1) Find the mass of 10 cm3 of copper.

2) Find the volume of 50 g of aluminum.

3) 21 g of silver has a volume of 2 ml. What is the density of silver?

4) Find the mass of 500 ml of gasoline.

5) Find the volume of 100 g of air.

6) 18 g of titanium has a volume of 4 cm3. What is the density of titanium?