Matter

Definition of matter in general

What is matter? Matter is anything where **mass** can occupies **space**. All living things are matter but not all non living things are matter.
Jirim terdiri daripada jisim yang memenuhi ruang

Example of living things are matter:-
Contoh bendah hidup yang terdiri daripada jirim

a) Animals / Haiwan
b) Human/ Manusia
c) Insects/ Seranga

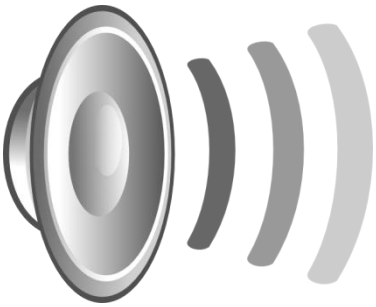


Non living things are matter:-
Benda bukan hidup yang terdiri daripada jirim

a) Fridge/ Peti sejuk
b) House/ Rumah
c) Car / Kereta

Non living things are not matter
Benda yang tidak terdiri daripada jirim

a) Electricity / Elektrik
b) Sound/ Bunyi
c) Light / Cahaya

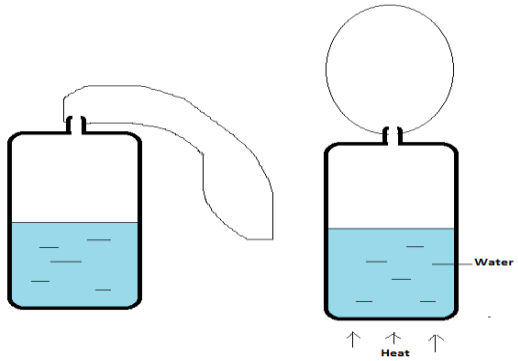




A very simple Experiment Air Has Mass / Udara mempunyai jisim

A very simple experiment to demonstrate that air has mass. When one of the balloons is pricked, the red balloon moves downwards while the blue balloon move upwards. This can clearly shown that air has mass.

Udara mempunyai jisim. Belon merah akan tercondong ke sebelah kanan apabila belon biru dipecahkan.

Experiment to show that air Occupy Space/ Udara terdiri daripada ruang



When the water is heated up the balloon rises. This clearly shows that balloon the hot air fill up the space in the balloons

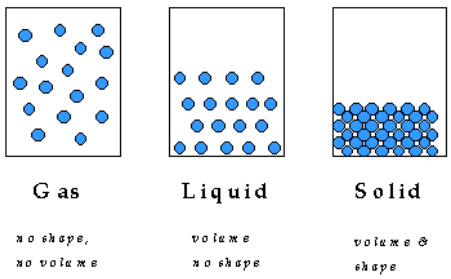
Apabila air dipanaskan, belon akan mengembang. Ini menunjukkan bahawa, udara memenuhi ruang

Measuring the mass of other material

a) Sand- Spring balance
b) Stone- spring balance
c) Chair/ table- spring balance
d) Sugar –Lever balance

State of Matter

a) Solid
b) Liquid
c) Gasses



Solid
- Close, well arranged and compact
- Has Shape
- Fixed Volume

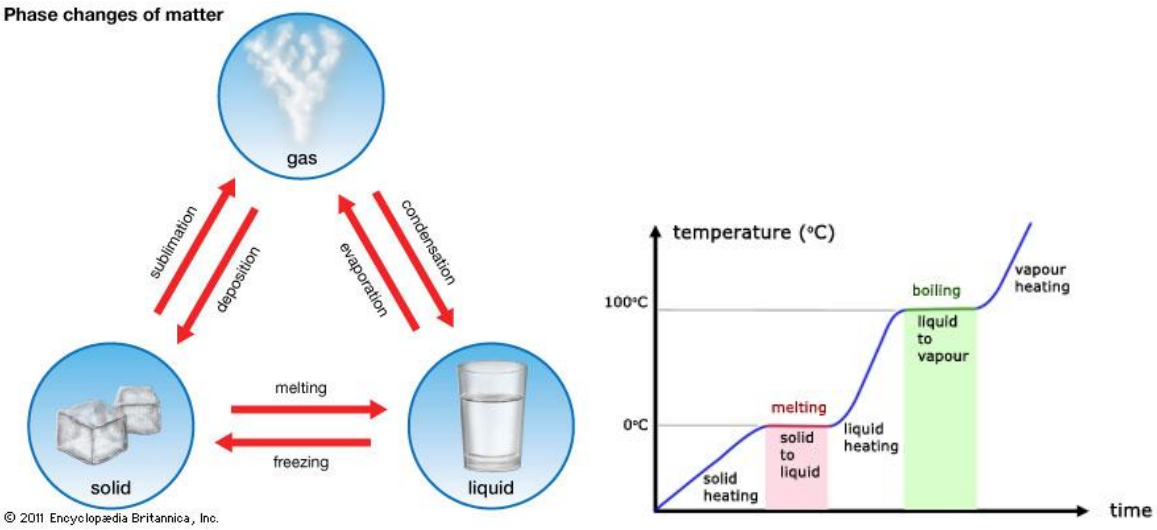
Liquid
- Not compact but still close together
- Non fixed shape
- Fixed Volume

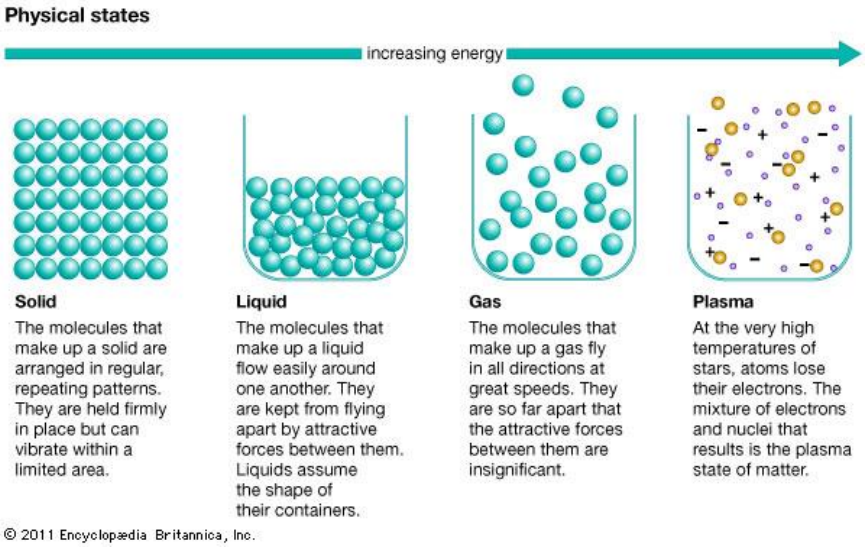
Gas
- Not arrange
- Non fixed shape
- Non Fixed Volume

Density (Floating and Sinking)

Density is define as mass per unit volume

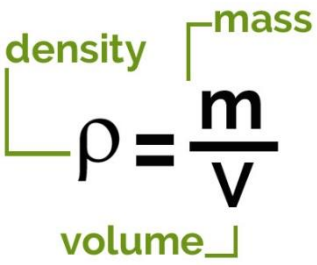
$$\rho = \frac{mass}{Volume}$$





Density

Calculation is shown below



Float or sink of an object is all depending on the density of the object. Let's look at the diagram below

Detail discussion about 3 States of Matter

Discussion	Solid	Liquid	Gas
Arrangement of the matter **Susuna zarah zarah**	Particles are arrange in a very close up manner Zarah zarah disusun dengan sangat rapat	Particles are arrange in not very close in manner Zarah- zarah disusun dengan lebih longgar	Particles are arrange far from each other Zarah- sarah disusun jauh antara satu sama lain
Movement of the matter **Pergerakan zarah zarah**	Particles vibrates at the fixed location Zarah zarah bergetar pada kedudukan yang sama	Particles are able to move freely Zarah-zarah boleh bergerak dengan lebih jauh	Particles move freely Zarah- zarah bergerak dengan bebas
Shape **Bentuk**	Fixed shape Bentuk yang tetap	Shape following the container Bentuk mengikut bentuk bekas	Shape following the container Bentuk mengikut bentuk bekas
Volume **Isipadu**	Fixed Volume Isipadu yang tetap	Fixed Volume Isipadu tetap	Volume dependent on the shape of the container Isipadu bergantung pada bekas
Density **Ketumpatan**	High density Ketumpatan tinggi	Medium density Ketumpatan tinggi	Less dense Ketumpatan rendah
Compressable **Kemampatan**	Cannot compressed Tidak dapat dimampatkan lagi	Very hard to compress Susah dimampatkan lagi	Easy to compress Senang dimampatkan
Kinetic Energy **Tenaga Kinetik**	Low kinetic energy Tenaga kinetik yang rendah	Medium kinetic energy Tenaga kinetic yang sederhana	High kinetic energy Tenaga kinetik yang rendah

Diffusion / Resapan

What is diffusion?
It is a process when medium particles travels from dense region to less dense region

Apakah itu proses resapan?
Satu proses dimana zarah zarah bergerak dari kawasan berketumpatan tinggi ke kawasan berketumpatan rendah

Diffusion in the liquid

3 seconds 10 seconds 20 seconds

Steps

1. Place 200ml water in the conical flask
2. Drop food coloring into the water and observed
3. Observed the water after 3 seconds, 10 seconds, 20 seconds

Result
Colour spread from 3 seconds to 20 seconds from high concentration to low concention

List Some Factors That Would Increase the Rate of Diffusion

- Temperature: As temperature increases the average kinetic energy of particles increases. Greater kinetic energies lead to increased velocities. The increased velocity means that there is a greater chance of collisions between particles, resulting in an increased rate of diffusion. Generally, the rate of diffusion increases with temperature.

  Suhu: Suhu yang tinggi menyebabkan tenaga kinetic zarah zarah bertambah. Ini membantu meningkatkan kadar resapan

- Density is defined as the amount of material that exists within a given volume. Regions of high density contain a greater number of particles per unit volume than regions of lower density. An increased number of particles leads to a greater chance of collisions, and this leads to an increased rate of diffusion. A lower number of particles leads to a reduced chance of collisions and this lowers the rate of diffusion. Therefore, high-density regions have a greater rate of diffusion than low-density regions.
  Ketumpatan bahan resap: Bahan resapan yang berketumpatan tinggi mempunyai bilangan zarah yang tinggi. Ini akan membantu meningkatkan proses resapan kerana zarah zarah dapat berlanggar denga lebih kerap di kawasan berketumpatan tinggi

- The concentration of a substance is defined as the number of solute molecules that can be found within a given volume. Volumes of high concentration gradient have a large difference in the concentration of molecules over a unit length. A large difference in concentration leads to a greater probability of molecular collisions over the region and therefore increases the rate of diffusion. Generally, the greater the concentration gradient, the greater the rate of diffusion.Concentration Gradient.
  Kawasan berketumpatan : Tempat yang berketumpatan tinggi lebih senang melakukan proses resapan. Ini kerana kawasan yang berketumpatan tiggi mempunyai zarah zarah yang lebih banyak dan ini dapat membantu proses resapan