PT3 2015

SCIENCE

EXAM TIPS website

www.andrewchoo.edu.my

MENGIKUT SUKATAN
LEMBAGA PEPERIKSAAN MALAYSIA

MESTI "**DOWNLOAD**" untuk persiapan PT3.

News:

Kejayaan terbesar – Hebat

1. Hampir kesemua soalan 2014 yang keluar dalam PT3, Nota Exam Tips pasti ada (lihat **2014**).

2. INGAT, Nota Exam Tips ini bukannya banyak.

3. Nota Exam Tips diberi bab demi bab untuk memudahkan pembacaan.

4. Untuk Nota Exam Tips 2015 yang lebih tepat dengan contoh soalan dan sample jawapan sekali, "order" Buku Exam Tips 2015 sekarang.(versi Bahasa Inggeris)

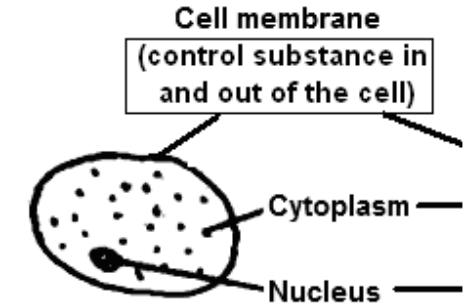
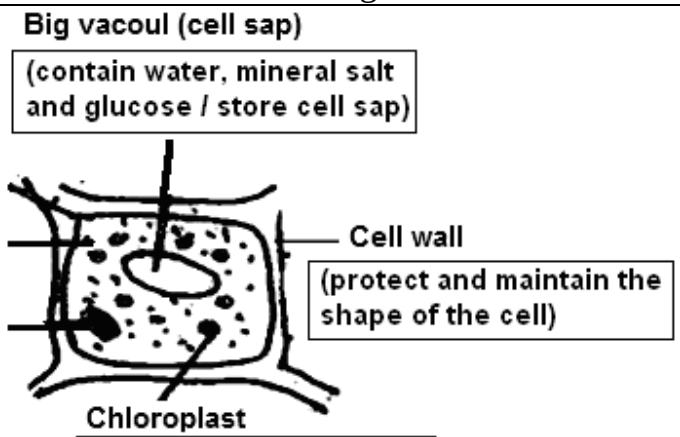
5. Buku "Exam Tips" 2015 mesti ditempah untuk skor PT3 2015.

NOTA EXAM TIPS PT3 website
FORM 1 SCIENCE

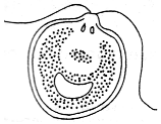
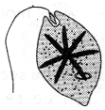
CHAPTER 2 CELL AS A UNIT OF LIFE

1.a. **Cells:** - carry out life processes
- basic unit of life.

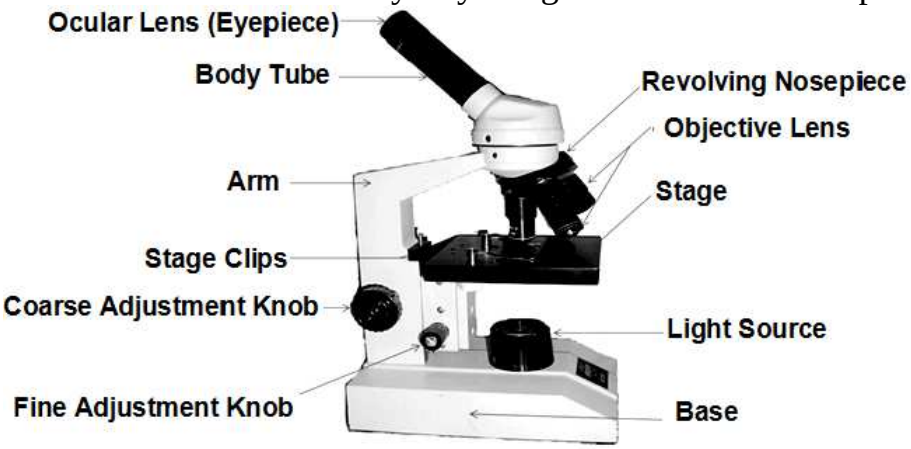
b.

Cell 2014	
a. **Animal**	b. **Plant**
- e.g. cheek cell	- e.g. onion cell
 i. No cell wall / fixed shape ii. No chloroplast / big vacoul	 i. Has cell wall / fixed shape ii.Has chloroplast / big vacoul

2.

Organism 2014			
Multicellular (can't move)		**Unicellular (can move)**	
Plants		**Animals**	**Plants**
- with chloroplast - can make food by photosynthesis  Spirogyra	- without chloroplast - can't make food.  Mucuor  Hydra  Mushroom 	- Without chloroplast - Can't make food  Paramecium  Amoeba	- With chloroplast - Can make food by photosynthesis  Chlamydomonas  Euglena

3a. **Microscope –** is to observe and indentify tiny things such as bacteria in patient's body.

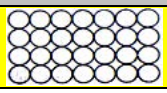
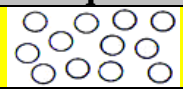
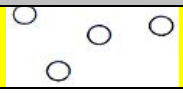


b. Place specimen → Add a drop of water →cover with a cover slip → make sure air bubble are not trapped under the cover slip.

4. Magnetic Resonance Imaging (MRI) scan in used to observe internal body clearly.

CHAPTER 3 MATTER

1. **States of Matter 2014**

	Criteria	Solid	Liquid	Gas
i.	**Diagram**			
ii.	**Arrangement of the particles**	- Arranged closely together in **orderly arrangement** - vibrate in its fixed positions	- Start to move apart slowly. - Still **closely together** but not orderly arranged. - Has a fixed volume	- **Far apart** and move more rapidly at higher speed. - **no fixed volume**
iii.	**Compressible**	Can't	Can't	**Can be compressed**
iv.	**Diffusion**	-	Slow	Fastest
v.	**Forces between the particles**	- Strong	- **Weak**	- No force
vi.	**Movement of particles**	- Vibrate in a fixed positions	- Vibrate and move through the liquid	- Move about freely / randomly.
vii.	**Kinetic energy**	- Decrease	- Medium	- Higher
	Example	- Iron/sugar/cork	- Alcohol/water	- Oxygen/Hydrogen
viii.	**Space between particles**	- very small	- small	- big

2a.

Matter	
Solid ⇌ (melting / heat up; freezing /cooling) Liquid	
Freezing	**Melting**
- Kinetic energy ↓/ heat is released - Distance between molecules nearer. - The particles become closely together and orderly arranged. - Particle vibrate only - Can't move freely	- Kinetic energy ↑/ heat is absorbed - Distance between molecules become further - The particles move further apart and faster - Move randomly - collision greater

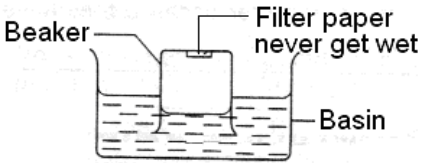
Number of molecules unchanged
Size of molecule unchanged

b.

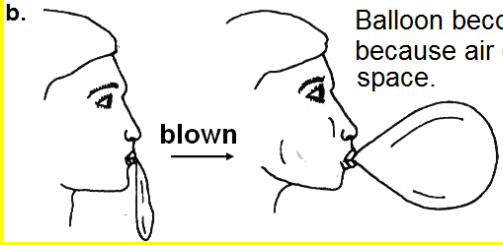
Liquid ⇌ (heat up / boiling; heat loss / condensation) Gas	
- Kinetic energy ↓/ heat loss - Distance of particles closer - Particles moves slower	- Kinetic energy ↑/ heat absorbed - Distance of particles increase - Particles moves faster

3. **Properties of particles in matter: 2014**
- has volume, mass and occupy space.

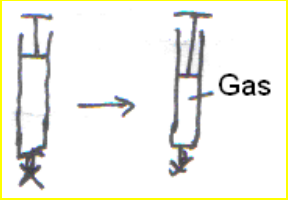
a. **Air occupies space**



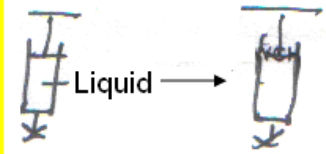
b.



4a. **Gas is compressible** (because the gas particles are far apart)



b. **Liquid is uncompressible** (because the liquid particles are closely together)



CHAPTER 4 VARIETY OF RESOURCE ON EARTH

1.

Characteristic	
i. **Metal**	ii. **Non-metal**
- Ductile - Malleable **2014** - Shinny - Conduct electricity / heat - Has very high melting point - e.g: gold, copper, zinc,iron (*except:* **mercury** which is only shinny and **conduct** electricity only).	- Fragile - Non-shinny / dull - Insulator / **do not conduct electric** - e.g: wood, glass, **sulphur**, chlorine, carbon

CHAPTER 5 THE AIR AROUND US

1 a. **Composition of Air 2014**

	Inhale	Exhale	Differences
Nitrogen	78%	78%	Unchanged
Oxygen	21%	16%	Decrease
Carbon dioxide	0.03%	4%	Increase
Inert gas	0.9%	0.9%	Unchanged
Water vapour	Less	More	Increase

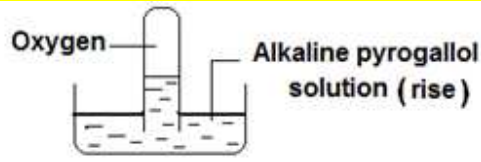
- Oxygen is decreases in exhale air as it is used for respiration.
- **Inert gases :** Angon, Neon, Krypton, Helium

2. **Ways to prevent air pollution 2014**
- enforcement of laws
- used unleaded petrol
- practice car-pooling system
- ban open burning in public area.
- replanting tree / reforestation
- reinforce the law to require the manufactures to install a filter at chimney
- proper treatment of effluent

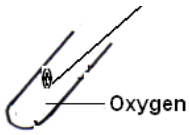
3. **Prevent depleting of ozone 2014**
- reduce the usage of CFC materials in air conditioning and aerosiol can
- use eco-friendly refrigerator and air conditioning

4. **Ozone layer 2014**
- Consist of three oxygen atoms.
- protect our earth from harmful ultra-violet
- ultra-violet can cause eye cataract and skin cancer.
- ozone layer can be depleted by CFC (chloroflour-carbon)

5.



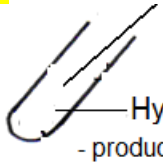
i. Oxygen 2014 can



a. dissolve into water
b. dissolve into alkaline pyrogallol solution
c. **relight a glowing splinter (support combustion)**
d. for respiration of organism
- neutral/ colourless

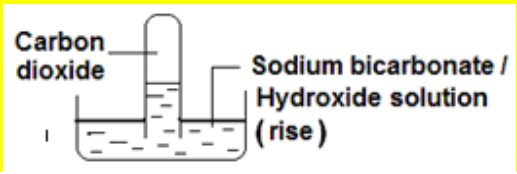
e. tasteless
f. Colourless and odourless

ii. **Hydrogen**



- produce a 'pop' sound

6.



Carbon dioxide (acidic)

a. Dissolve or absorbed by sodium bicarbonate solution / sodium hydroxide solution.
b. Turns bicarbonate indicator yellowish
c. Turns lime water cloudy **2014**
d. Turns moist blue litmus paper into red (acidic).
e. Extinguish a burning splinter / do not support combustion.
f. Excess carbon dioxide cause greenhouse effect.
g. Used in photosynthesis process.
h. Sour taste
i. Slightly soluble in water
j. Colourless and odourless

7a.

Natural Resource	
- living things - air - water - soil	- minerals - gas - light - fossil fuel (petroleum, natural gas, coal)

b. Conservation is using natural resources efficiently without any wastage.
Examples:
i. Only mature tree to be felled.
ii. Recycling the wastes.

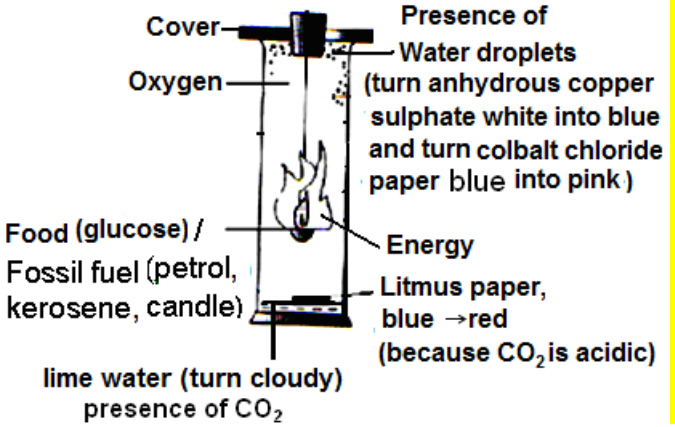
c. Preservation is protect and maintain the natural resources at its natural state.
Examples:
i. Declare forest reserved
ii. Establish wildlife sanctuary.

8a. **Respiration 2014**

Food / Glucose + Oxygen
→Carbon dioxide + Water+ Energy

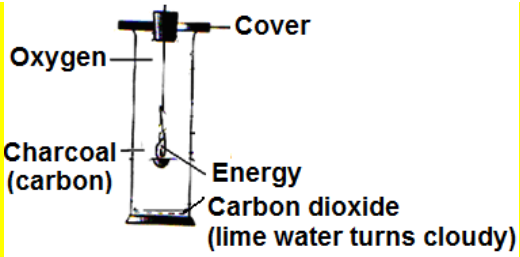
9. **Combustion of food / fossil fuel**

Fuel (candle) + Oxygen
→Carbon dioxide + Water vapour + Energy



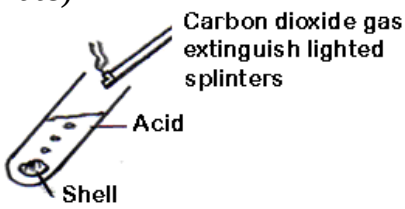
10. **Combustion of charcoal / carbon**

Carbon (charcoal) + oxygen
→ carbon dioxide + energy



d. Combustion needs fuel/ carbon, oxygen and heat.

11. **Snail shell + dilute acid →carbon dioxide** (Carbonate)



8 a. **Pollutant**

i. **CFC**	Thinning the ozone layer
ii. **Lead**	Damage the

	nervous system
iii. **Soot**	Retard the growth of plant cause respiratory problem
iv. **Carbon dioxide**	Cause green house effect and global warming
v. **Chemical waste/sulphur dioxide**	From factory
vi. **Fertilizer / Nitrogenous compound**	From agriculture land

vii. **Oil**	From tanker ship at the port or harbour
viii. **Carbon monoxide (from exhaust pipe)**	Harmful to respiratory system / **reduce in take of oxygen** to the brain.
ix. **Acid rain**	corrode roofs and buildings

CHAPTER 6 SOURCES OF ENERGY

1. **Potential Energy 2014**
   - Going upward / aeroplane flying
   - Stretch or compress a rubber/spring
   - Water in a dam / catapult / fruit on tree
   - Winding the spring of a toy car.
2. **Kinetic Energy**
   - Moving / dropping / falling / spinning / flying / vibration

3. **Chemical Energy 2014**
   - Battery / dry cell / candle
   - Food / photosynthesis
   - Fossil fuel (petroleum, natural gas, coal)

4. **Biomass / Biogas 2014**
   - Produce by decomposition decaying of agriculture wastes such as oil palm husk or coconut shell or animal wastes.
   - Renewable energy

5. a. **Source of energy**

Source of energy	
a. **Renewable (alternative energy)**	b. **Non-renewable**
- Wave - Wind / windmill - **Biomass** / biogas (Decaying of plant / animal waste) - Solar panel / sunlight **2014** - Fire wood / plant / charcoal - Hydroelectric / water **2014** - Geothermal: hot water from inside the earth. **Advantage** - It is economical - Produce unlimited electricity - It is pollution free. - It is renewable energy **Disadvantage** - high cost of installation and maintenance.	- **Radioactive** / uranium /nuclear (release heat, sound and light energy) - **Fossil fuel** (petroleum, coal, natural gas) **Disadvantage** - It cause pollution - It is non-renewable energy **Ways to overcome shortage of fuel** - encourage the use of renewable energy - replace fuel resources of vehicles with electric

b. **Power plant (Geothermal energy)**
   - to heat up factories and homes
   - to turn turbines to generate electricity from Geysers, volcanic eruptions

c. **Principle of conservation of energy**:
- **Energy** cannot be created or destroyed
- energy can change from one to another

6. Malaysia does not have strong wind, therefore cannot generate efficient electrical energy.

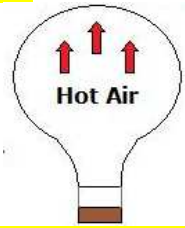
CHAPTER 7 HEAT

1.

Differences	
Evaporation	**Boiling**
- occur on the surface	- occur all over the liquid
- occur at any temperature below 100ºC	- occur at 100 ºC only
- slow process	- quick process

2. **Function of Car Coolant**
- increase the boiling point of the water
- maintain the engine at the best operating temperature
- absorb excess heat
- lower the temperature of the water

3. **Hot air balloon**

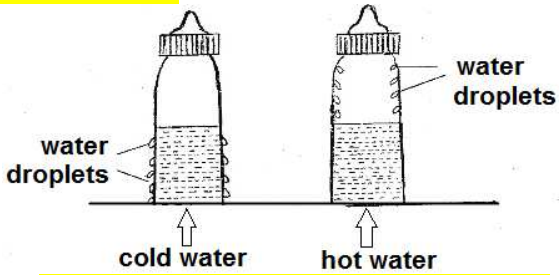


- The air in the hot air balloon expands when heated.
- As hot air is less dense than the ordinary cold air, the balloon rises up.

4. **Igloos**

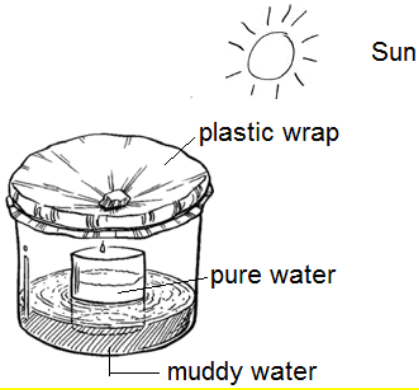
- Made up of ice
- Ice is a good insulator of heat.
- Heat is therefore trapped inside the igloos.
- It prevents heat loss from the igloo.

5. **Water bottle**



- when surrounding water vapour comes in contact with cool outer surface of bottle. The water vapour condensed and form water droplets outside the bottle.
- Hot water evaporated and rose to the top of bottle. As hot water vapour touched cool inner surface of bottle, it condensed and form water droplets inside the bottle.

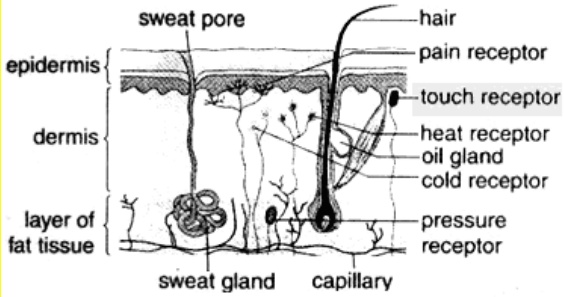
6. **Water from muddy**



- The heat from sunlight causes muddy water evaporates to form water vapour. The water vapour form water droplets

when it comes into contact with cooler inner surface of plastic sheet. Mud remains at bottom of basin. The water droplets fall into glass as pure water.

1. **SKIN** = the biggest sensory organ of touch

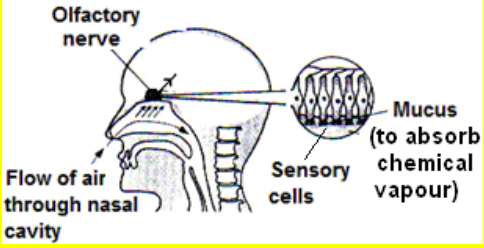


a. **The sensitivity of the skin depends on the**:
   i. Thickness of the epidermis
      (thickness ↑ = sensitivity↓)
   ii. Number of receptors presence
      (number ↑ = sensitivity ↑)

b. The skin on the neck, lips **2014**, fingertips, and armpit are more sensitive because these parts have
   i. thin epidermis
   ii. more receptors

than the skin of the knee and elbow or heel.

2. **NOSE**
(SENSORY OF SMELL)



a. **Ways to protect your sense of smell:**
   i. avoid exposure to toxic substances
   ii. the chemicals can damage the receptors of cell

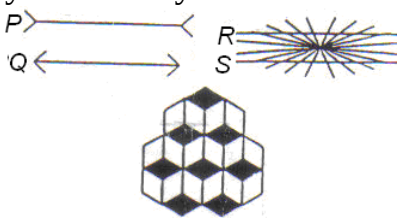
3e. Chemical → nasal cavity → mucus → sensory cell → impulses → olfactory nerve → Brain

4a. **Astigmatism 2014**
- Image form on the retina is not very clear because the **cornea is not evenly curved**
- Overcome by wearing glasses with **cylindrical lenses**.

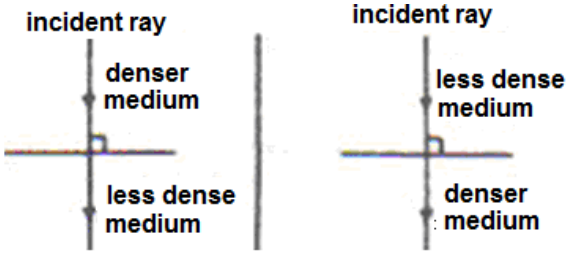
b. Colour blindness 2014
- Unable to differentiate certain colours such as green and red.

5a. **Optical illusion.2014**

i. The brain **cannot interpret accurately** the information sent by the receptors in the eye caused by disturbances.



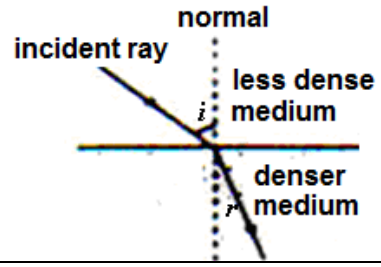
6a. The light ray is directed perpendicular to the surface into a different medium.
- The incident ray moves straight along the normal through the medium.
- Angle of incidence = Angle of refraction = 0°.



b. The incident ray moves from a **less dense medium to a denser medium**.2014
- The light ray is refracted towards the

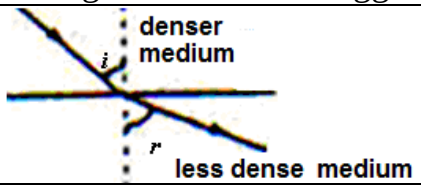
normal.

i = angle of incidence bigger
r = angle of refraction smaller



c. The light ray moves from a **denser medium to a less dense medium**.
- The light ray is refracted away from the normal.

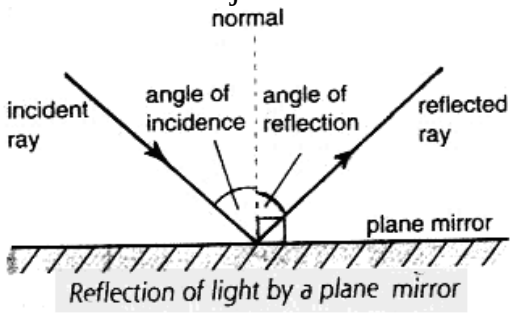
i = angle of incidence smaller
r = angle of refraction bigger



LIGHT AND SIGHT

1. Reflection of light

- Occur when light bounces off the surface of an object.



Reflection of light by a plane mirror

a. According to the **Law of Reflection**:

i. The incident ray, reflected ray and the normal are all on the **same plane**.

ii. The **angle of incident** is **equal** to the **angle of reflection**.

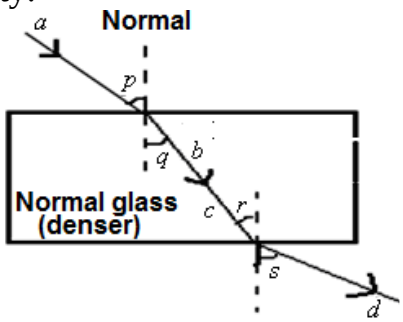
2. **Formation of shadow**, eclipse of moon and sun is because of

i. Light travels in a straight line.

ii. Light cannot pass through an opaque object

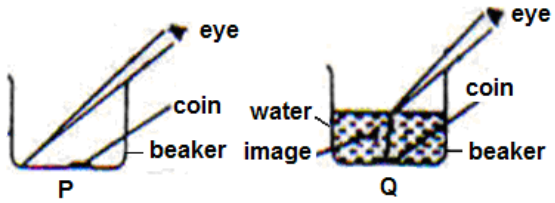
3. REFRACTION OF LIGHTS

a. Occur when light travels from one medium to another medium of different density.



p = angle of incident
q = angle of refraction
r = angle of incident
s = angle of refraction
a = incident ray
b = refracted ray
c = incident ray
d = refracted ray

4. **Daily phenomena of refraction of light**:



- The coin cannot be seen in P.
- The coin can now be seen as it appears to be closer to the surface in Q

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HUMAN DIGESTIVE SYSTEM

1. a. **Digestion system -** To digest food and absorption of digested food

b. Digestion is a process of breaking down large food substances into simpler molecules to be absorbed by body cells.**2014**

2. Mouth → Oesophagus → Stomach → Duodenum → Small intestine → Large intestine → Anus

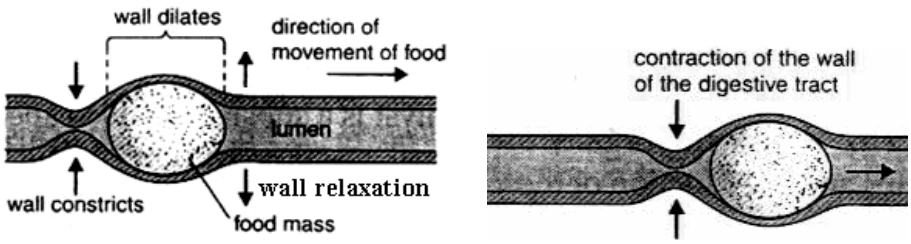
3. **Digestion Table**

Alimentary	Medium	Enzyme	Food	Digested
d. **Small intestine** (intestine juice) i. digest food ii. absorption of digested food **2014**	Acidic	a. Erepsin	Peptones / Protein	Amino acids
		b. Maltase c. Sucrase d. Lactase	Maltose Sucrose Lactose	Glucose Glucose Glucose
e. **Large intestine**	Reabsorption of water and mineral salts **2014**			

HUMAN DIGESTIVE SYSTEM

1. **Peristalsis.**

- Is the **contraction** and **relaxation** of the walls of the oesophagus or alimentary canal to push digested food along the alimentary canal.



Food moves along the digestive tract by the process of peristalsis.

2. **Mouth** (Starch is digested)

a. i. The salivary glands secrete saliva, which contains amylase enzymes.

ii. Starch $\xrightarrow[\text{enzyme}]{\text{amylase}}$ maltose / glucose

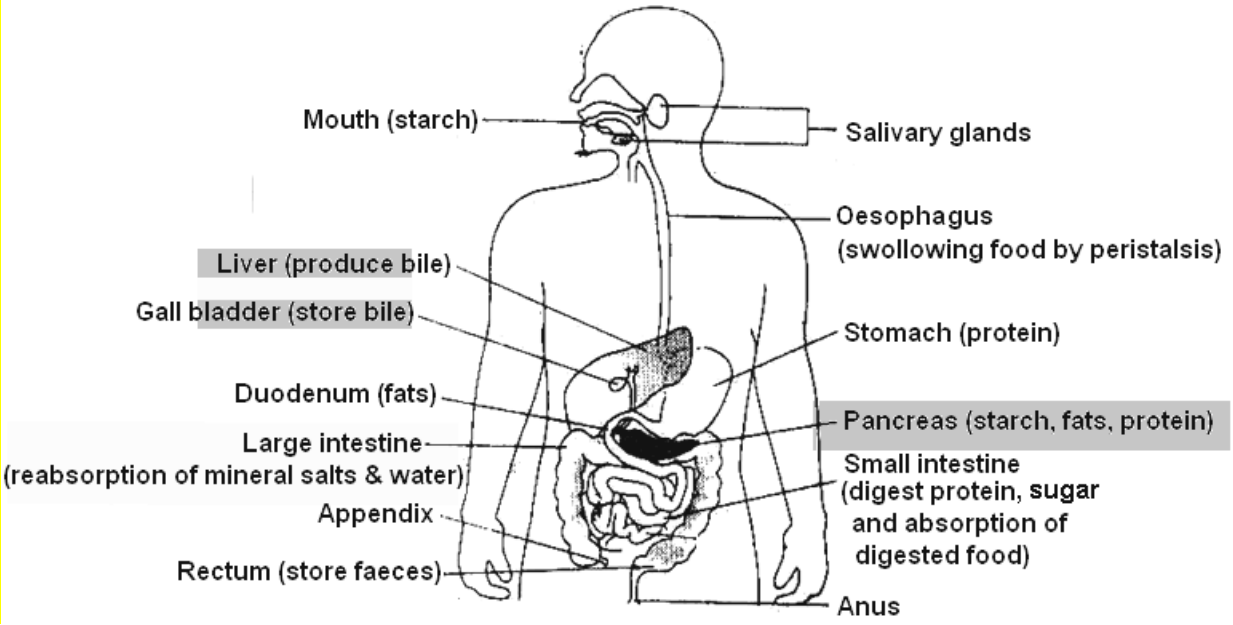
b. **Stomach.** (Protein is digested)

Secretes gastric juice which contains:

i.	**Hydrochloric Acid**	- Neutralize the alkaline from the saliva. - Stop the function of amylase enzymes in the saliva.. - Provide an acidic medium for the action of protease enzymes in the stomach. - To kill bacteria

ii.	**Casein enzymes**	- Congulate the liquid milk into solid form. Liquid milk $\xrightarrow{\text{casein enzyme}}$ solid milk.
iii.	**Protease / Pepsine enzymes**	Protein $\xrightarrow{\text{protease / pepsine enzyme}}$ peptones / amino acid

3.Digestive system



4. **Characteristic of ileum that good in absorption**:

- 6 meters long.
- Thin walls.
- Has many villous (increase the surface area of absorption).

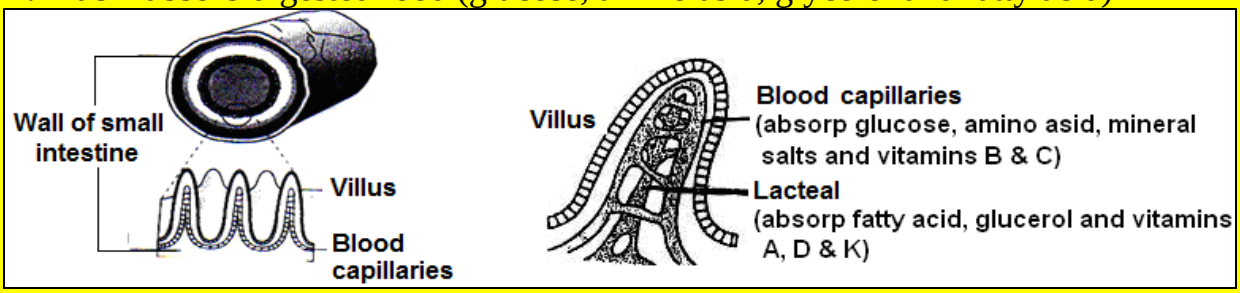
i. **Blood capillaries**

- Absorb glucose, amino acids, minerals and water soluble vitamins (B & C).

ii. **Lacteal**

- Absorb fatty acids, glycerol and fats-soluble vitamins (A, D, E, & K)

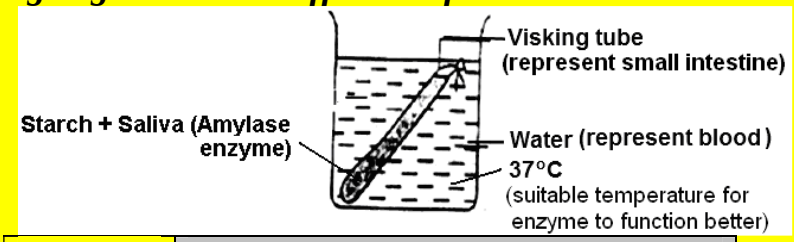
Villus – absorb digested food (glucose, amino asid, glycerol and fatty acid)



5.

Classes of Food	enzyme →	End Product / Digested food
Carbohydrate / Starch	Amylase →	Glucose
Protein	Protease →	Amino acid
Fat	Lipase →	Fatty acids and glycerol

Experiment Showing Digestion and Diffusion of Food



a. **Observation**:

	Water	
	Beginning	**End**
Starch	×	×
Glucose	×	✓

b. No starch is present in the distilled water at the end as the starch molecules are too big to diffuse through the visking tube.

c. The water turns brick-red precipitate when tested with Benedicts solution (presence of glucose). The glucose molecules are small enough to diffuse through the visking tube.

d. **Conclusion:**

The **amylase enzyme** in the saliva has digested the starch into glucose which is small enough to diffuse into the water through the visking tube.

e. If the water is boiled, the enzyme in the saliva will be destroyed and the starch will not change into glucose.

5. **Digestion Table**

Alimentary	Medium	Enzyme	Food	Digested
a. **Mouth** (saliva)	Alkali	Amylase	Starch (carbohydrate)	Maltose/ glucose
b. **Stomach** (gastric juice) - digest food **2014**	Acidic contain hydrochloric acid	i. Casein	Liquid milk	Solid milk
		ii. Pepsin / protease	Protein	Peptones / amino acid
c. **Duodenum** i. **Gall bladder** (bile)	Alkali	Fats → (bile) fats emulsion (small droplets) To emulsify fats into small droplets.		
ii. **Pancrease** (pancreatic juice)	Alkali	a. Amylase	starch	Maltose / glucose
		b. Lipase	fats emulsion	Fatty acid + glycerol
		c. Trysin / protease	Protein / peptones	Amino acid

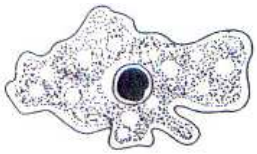
1.

Cellular

Unicellular

Animals

Paramecium

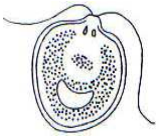


Amoeba

- without chlorophyll
- Can't make food by photosynthesis

Plants

Euglena



Chlamydomonas

- Contain chlorophyll
- Can make food by photosynthesis.

can move

Multicellular

Spirogyra

With chlorophyll (can make food by photosynthesis)

Hydra

Mucour / fungi

Mushroom / fungi

Without chlorophyll (can't make food by photosynthesis)

can't move

1. a. **Interaction** (to maintain the balance of ecosystem/ control size of population/ ensure survival of organism)

2. **Saprophytism** – are organism eats dead organism such as mushroom lives on dead tree.

3. **Biological Control**

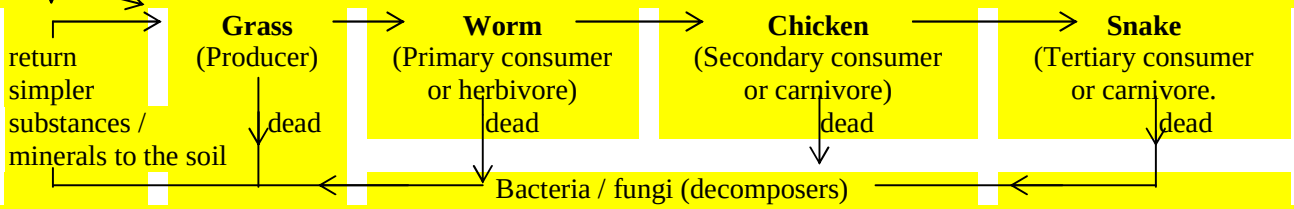
a. **Advantages:**

i Do not pollute the environment or damage the ecosystem.
ii It is economical and cheap / save labour, energy and cost.
iii It does not affect and kill other organisms.
iv It is a safe method.

4. Disadvantage: It is a **slow process**.
: The snakes may bite the workers.
: The population of fox decreases because the population of rat decreases.

6. **Food chain** - transfer of energy from one organism to another organism.
- is a relationship between organisms in an ecosystem that starts with producers.
- the sun is the main source of energy.

i. 
sunlight (main source of energy)



i. If snakes are killed, the population of chickens will increase, worm decrease but grass increase.
ii. If chicken increases, the chicken will compete for food and the population of worm decrease but grass increase. However, the population of snake increases.

a. Predator-prey 2014	- **One organism eats another organism**. - Guppy fish eats the larvae of the mosquitoes - Snakes eat rats / frog eat fly **2014** - Tigers (predators benefits) eat deer (preys loses) [If number of predators ↑, number of preys ↓]
b. **Competition 2014**	- **Animals compete for food, shelter, mates, spaces or sunlight** (same need / to get survival need) - Plants compete for space, sunlight, water and minerals.**2014** - Paddy plants and maize plants in the same box. - Paramecium Aurelia and paramecium Caudatum compete for survival.

	- Rose and Carnation in the same garden. - Horse and cow on the same field compete for grass. - Sparrow and pigeon compete for food
c. **Decomposers**	- fungi and bacteria that **break down dead organisms** / change complex substance to simple substance. - return simpler substances / minerals to the soil as nutrient for the growth of plant.
d. **Producers**	- green plants has chlorophyll and is able to make its own food through photosynthesis. Convert sunlight / light energy into food (chemical energy). - change simple substance to complex substance.
e. Consumer	- Organism that eats each other.

7. Pyramid Number

a. A pyramid number is a hierarchy that **shows the number of organisms** in each level of the food chain.

b. **Moving up a pyramid number** shows:
   i. a decrease in number of organisms.
   ii. An increase in organism size.
   iii. 90% energy loss between one level to another level

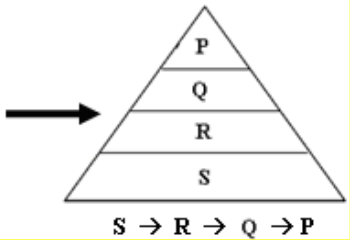
c. The number of organisms at each level must be maintained so that there are enough organisms to support the next level of organisms.

d. **The importance of maintain the relative number** of organism in each level
   i. To maintain the balance of ecosystem
   ii. To maintain the number of producer and consumer

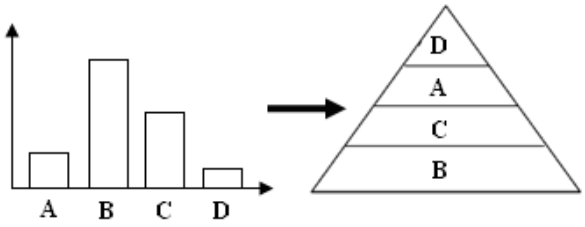
e. The amount of energy is decreasing from bottom to the summit. The energy lost through life processes and physical activities such as respiration, movement and others.

8i.

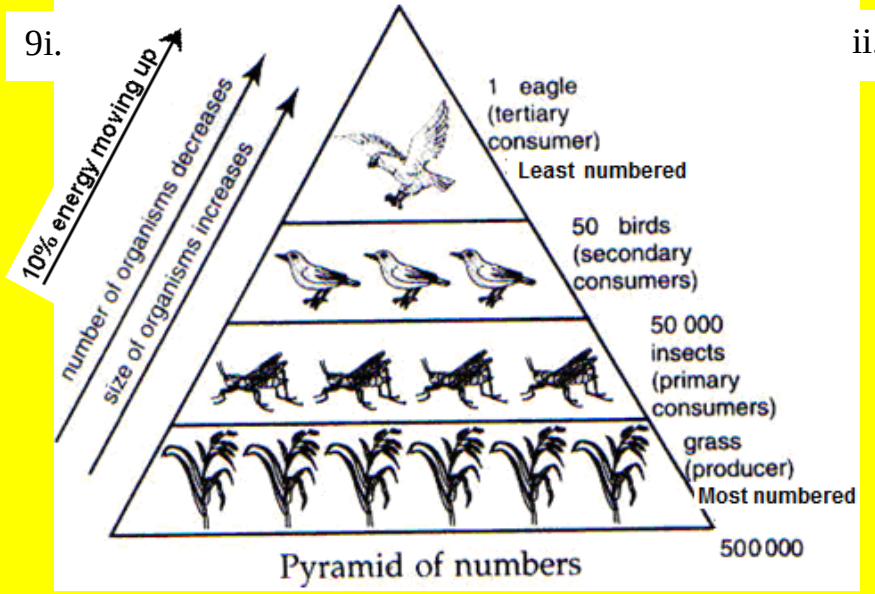
Organism	Number
P	2
Q	50
R	300
S	5000



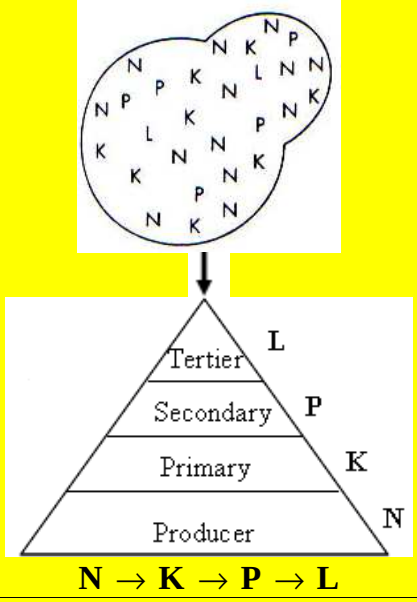
ii.



9i.



ii.



N → K → P → L

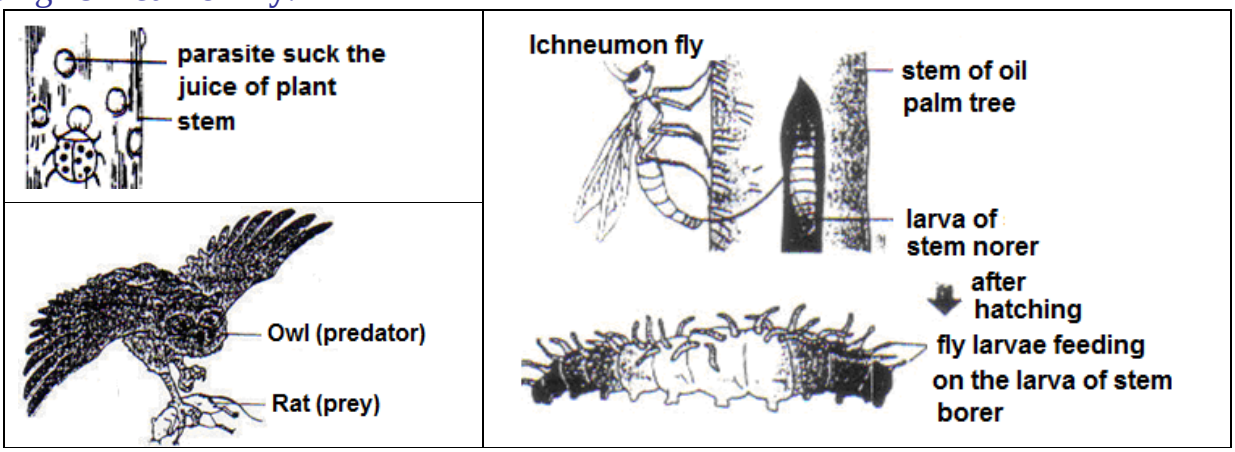
iii. **Producer** – which is the **most number** is put at the **base** of the pyramid.
iv. **Tertiery** –which is the **least number** is put at the **summit** of the pyramid (predator).

2. Biological Control

b. Using **natural predators** to control / reduce the population of pests (**predator - prey interaction**)

b. **Examples of biological control:**

- Rearing guppy fish in ponds or canals to feed on the larvae of the mosquitoes.
- Using ladybird beetles to feed on aphids.
- Planting Impetrate Cylindrice grass to control the growth of weeds in plantations.
- The **stem borer larva** who feed on the leaves of the oil palm tree can be controlled by using **Ichneumon fly**.



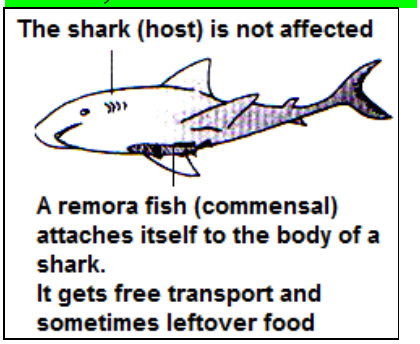
(Using owls or snakes to control the population of rats in the paddy field / palm oil estate).

3.

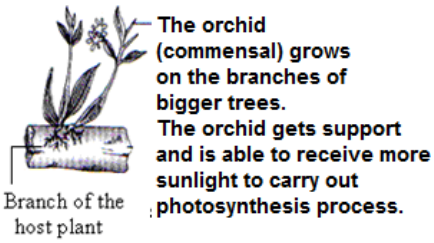
Symbiosis (living together)

i. Commensalisms 2014

- **Benefits one organism while the other organism is not affected/harmed**
- Commmensal benefits but host is not affected.
- Examples: **remora fish and shark, barnacles and whales, orchid and tree.2014**



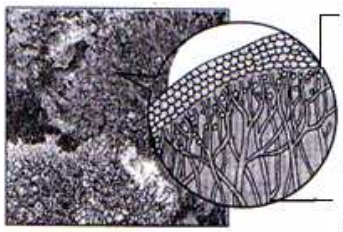
Remora fish and shark



Orchid and tree

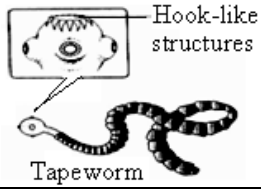
ii. Mutualism

- **Benefit both organisms.**
- Examples:
  a. **Nitrogen – fixing bacteria** (Rhizobium bacteria) in the nodules of the leguminous plant (peanut plant) supply nitrate to the plant while the plant give habitat and juice to the bacteria.
  b. **Cowbird** and **cow**.
  c. **Algae and** fungi living together.
  d. The **sea anemone** attaches itself to the shell of the **hermit crab**.
  e. Mynah and buffalo.



iii. Parasitism 2014

- **Benefits one organism but the other is harmed**
- Parasite benefits but host is harmed.**2014**
- Examples:
  a. **Aphids suck on the tree trunk**.
  b. **Rafflesia flowers 2014 suck nutrient on the tree trunks.**
  c. **Tapeworm suck nutrient in our intestine.**
  d. **Fungus (parasite) on tree trunk (host)**



1. Test of water 2014

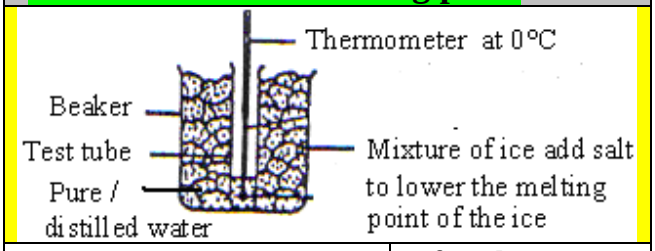
i. Turn anhydrous **copper sulphate crystal** from white to **blue**.

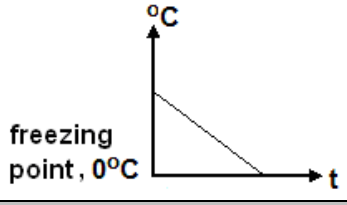
ii. Turn anhydrous **cobalt chloride paper** from blue to **pink**.

2. **Anhydrous calcium chloride / silicagel**

- absorb of water only / drying agent.

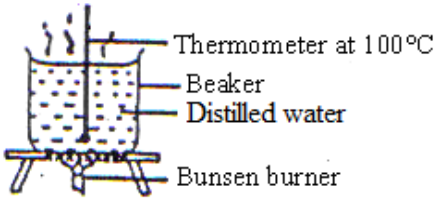
i. **To find freezing point 2014**

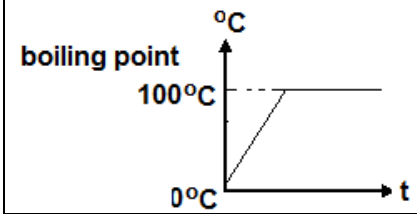




a fixed temperature when water turns into ice

ii. **To find boiling point**





is a fix temperature when water turns into gas

3. Determine the freezing point of pure water is 0°C and the boiling of pure water is 100°C.

4. COMPOSITION OF WATER 2014

a. **Electrolysis**

- **to break up /separate water molecules (compound) into its elements using electric energy.**

b. Electric energy $\xrightarrow{electrolisis}$ Chemical energy

e.g.:

i. **Water** $\xrightarrow{electrolisis}$ **Hydrogen + Oxygen**

ii. **Sodium chloride** $\xrightarrow{electrolisis}$ **Sodium + Chlorine**

5. EVAPORATION OF WATER

Liquid (water) ⟶ **Gas** (water vapour)

b. Release of water molecules into the air from the **surface** of the water (The water molecules absorb heat energy and turn into gas).**2014**

c. **Factors affects the rate of evaporation of water are:-2014**

i. **Humidity of air**
(Humidity ↓ , evaporation ↑)

ii. **Temperature of the environment**
(temperature ↑, evaporation ↑)

iii. **Surface area**
(surface ↑, evaporation ↑)

iv. **Movement of air**
(movement ↑, evaporation ↑)

6. Ways to save water

a. Use a pail instead of water direct from the tap.

b. Do not use washing machine to wash a few pieces of clothes

c. Wash the car on the grass instead on the pavement.

7. Differences between **2014**

Boiling	Evaporation
i. Occurs only at boiling point 100°C (fixed temperature)	Occurs at any temperature (below 100°C)

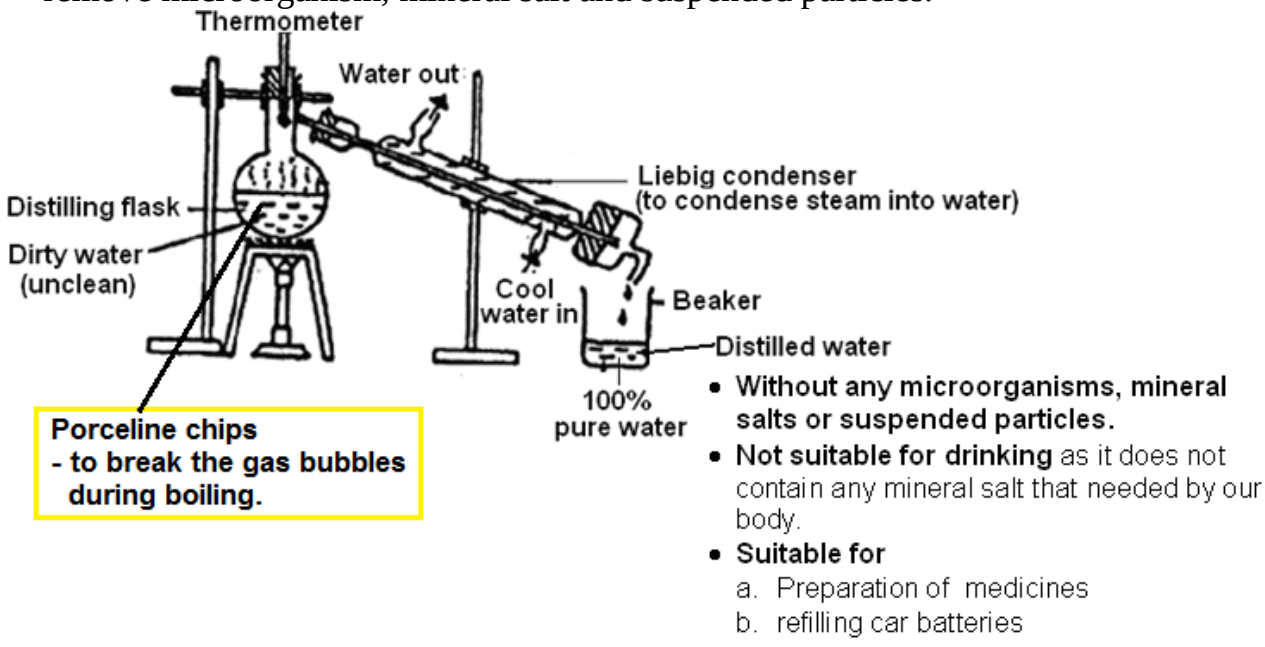
ii. Occurs all over the water (whole)	Occurs only at the **surface** of the water exposed
iii. Fast / Vigorous process	It is a slow process

8. Acid / alkali of a solution can be tested by various indicators as shown below:

Indicator	Colours in solution		
	Neutral	**Acidic**	**Alkaline**
a. Litmus paper	violet	Red	blue
b. Methyl orange	Orange	Red	Yellow
c. Universal indicator	Green **2014**	Yellow	Violet
d. Phenolphthalein	Colourless	Colourless	Pink
e. Bicarbonate indicator	Red	Yellow	Red

9. Distillation (to obtain pure water / distilled water) **2014**

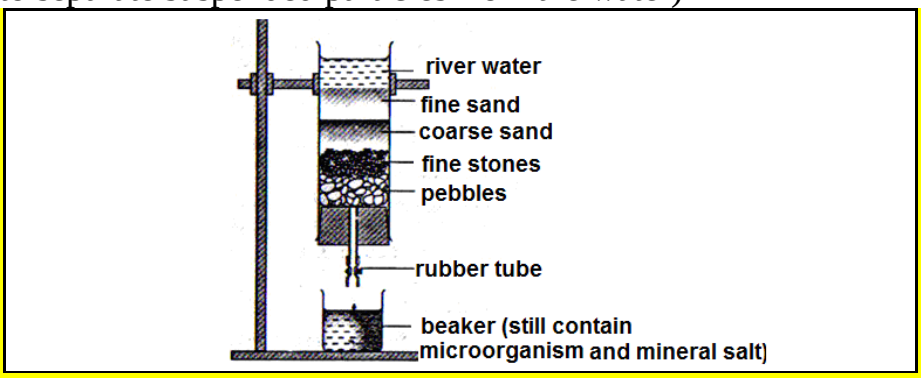
- remove microorganism, mineral salt and suspended particles.



10. Method of water Purification

a. Filtration	- To separate the suspended particles / insoluble solids from water. - Still contain microorganism and dissolved mineral salts.
b. **Boiling**	- To kill microorganisms in small amount of water. - Still contain mineral salt and suspended particles.
c. **Chlorination**	- To kill microorganisms in large amount of water / swimming pool. - Still contain mineral salts and suspended particles. Excess chlorine is harmful to health too.
d. **Distillation**	- Water is heated, so that its component evaporates as a vapours and then condensed to obtain pure water (distilled water) **without** any soluble mineral salts, microorganism or suspended particles.

11. Filtration (to separate suspended particles from the water)

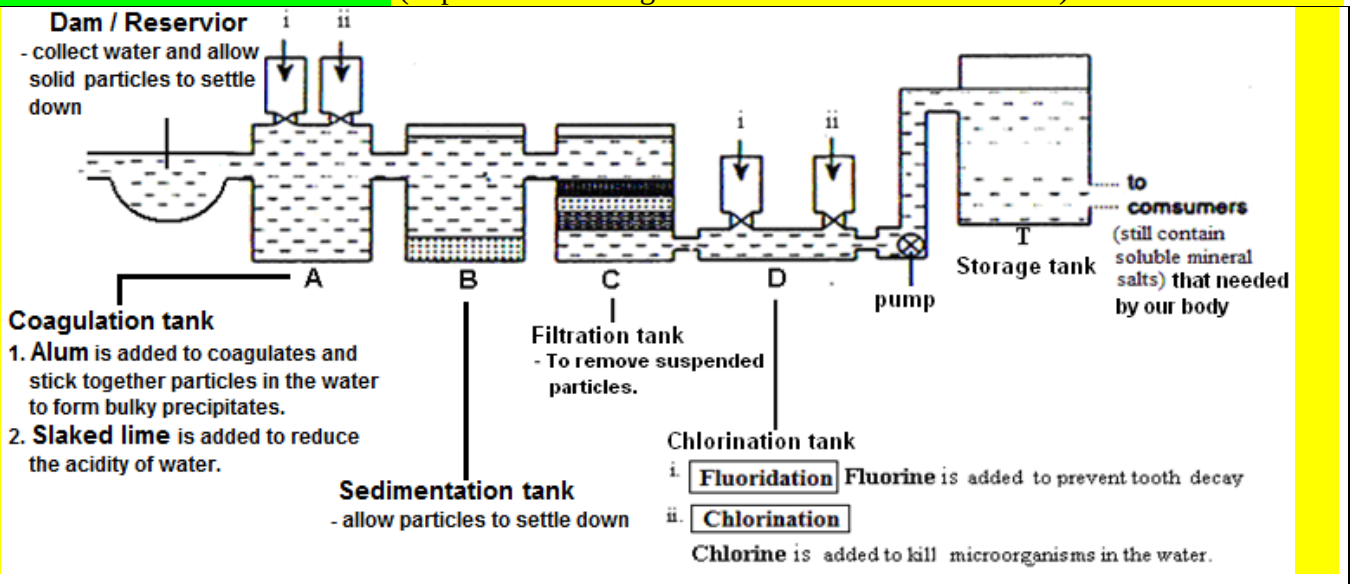


*Filtered water needs to be boiled to kill the microorganism before it is consumed.

12. **Pollution of water** is **contamination of water with harmful substances. It affects our health such as**

a. **Domestic waste**	- garbages - carcases - faeces from seawage	contain microorganism which cause cholera, sickness / diseases
b. **Industrial waste**	- chemical waste - radioactive waste	harmful chemical / toxic that kill aquatic life
c. **Agriculture waste**	- fertilizers - pesticides - weed killer	
d. **Port / Harbour waste**	- oil spills	

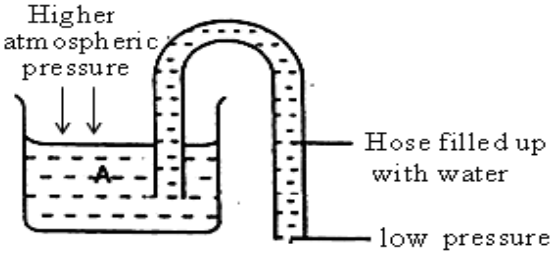
13a. **Water Treatment Plant 2014** (to produce drinking water with soluble mineral salts)



b. **Coagulation** → **Sedimentation** → **Filtration** → **Chlorination**

1. **Appliances using principle of air pressure.**

a. **Siphon**



- When the water flows out of the hose, the water pressure in the hose decreases.
- The water flow out because of **higher atmospheric pressure on the surface** of the water push the water out of the siphon.

b. Dropper

- A rubber dropper can't suck water if there is a hole
- the air pressure inside the dropper equal to the atmospheric air pressure
- the atmospheric air enters the hole.

c. **Syringe 2014**

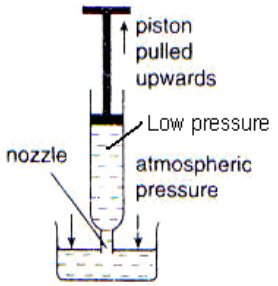


*Diagram (i)***2014**

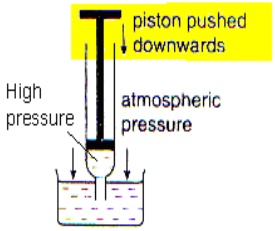


Diagram (ii)

Low Pressure	High Pressure
i. Distance between air particles increase. ii. The frequency of collisions become lesser. iii. Volume bigger iv. Pressure lower v. Particles move slower.	i. Distance between air particles decrease / nearer. ii. The frequency of collisions become greater. iii. Volume smaller iv. Pressure higher v. Particles move faster.

2. **Gas under high pressure/compressed gas**

a. At very **high pressure**, gas particles become closer and turn into liquid and usually stored in cylinder tanks.**2014**

b. Cooking gas, oxygen and insecticide sprays or aerosol can usually **stored at very high pressure in liquid** form as the volume of liquid is lesser than volume of gas **(larger volume of gas can be stored as liquid).** It can easily be carried too.**2014**

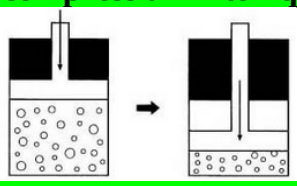
c. **Safety precautions of cylinders gas 2014**

i. Must be kept in an open area with good ventilation. / Ensure no leakage in the container.

ii. Must be kept in upright position / **vertically.**

iii. Must be kept far away from heat.

3. **Method to compress air into liquid 2014**

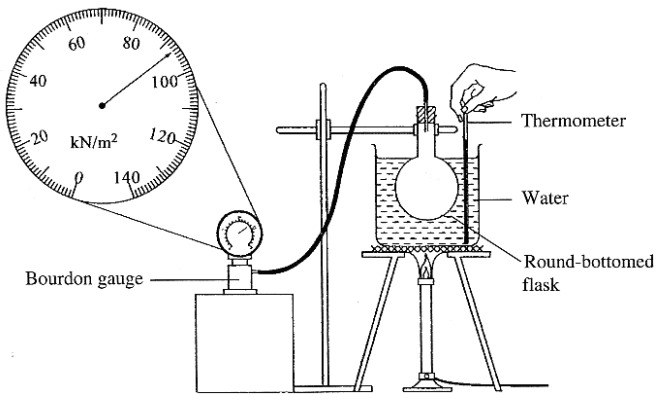


i. The gas particles are far apart

ii. There are large spaces in between the gas particles

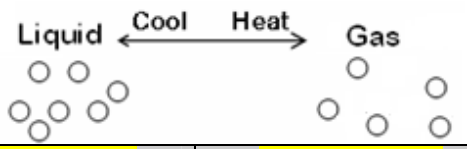
iii. When the piston is pressed, the gas particles move into the spaces and is compressed

4. Experiment showing that temperature affects air pressure



Variables
Manipulated: temperature Constant : size of the ball / volume of air Responding : Reading of the pressure gauge
Hypothesis
The higher the temperature, the bigger the pressure gauge reading
Relationship
The reading of Bourdon gauge increases with the temperature.
Inference
The air pressure increases with the temperature.
Conclusion
Temperature affects the air pressure.**2014**
Definition of air pressure
- is the pressure gauge reading.
Precaution
Water is needed to be stirred during heating. So that the air in the flask is heated evenly.

5.



Air is cooled	Air is heated
- distance nearer / closer - kinetic energy lower / collision lower / particles move slower - pressure lower - loss of heat	- distance further a apart - kinetic energy higher / collision greater / particles move faster - pressure higher - absorb heat

Mass, size, number of molecules and the weight remain unchanged

5. **The changes in the atmospheric pressure at different altitudes.**
(**Altitude -**distance above sea level)
   a. Altitude ↑→ density of air ↓→Air pressure ↓
   b. The gravitational pull between the earth and air molecules is greater nearer to earth compared to further away. These molecules are closer together and the pressure increases between them.
   c. As the altitude increase, there are lesser air molecules and the molecules are more dispersed. The air becomes thinner and air density is lower.
   d. The thinner or less dense air exerts less pressure.
   e. At high altitudes,
      i. Mountain hiker will feel sick because the thinner air and lower atmospheric pressure make breathing difficult.
      ii. Boiling water at a temperature below $100\,^{\circ}C$. As the altitude increases, the external pressure on the water decreases, so it will take less energy to free the water molecules from their bonds. Thus, less heat is required to boil water.

1. Work Done

a. Work done is when a **force** moves an object to a **distance**

b.

Work Done = Force × Distance
(Joule) (Newton) (Metre)

2. Power

a. Power is rate of work done / work done in a second.

b.

$$\textbf{Power (Watt)} = \frac{\textbf{Work Done (Joule)}}{\textbf{Time (second)}}$$

$$= \frac{\text{Force} \times \text{Distance}}{\text{Time}}$$

c. **A box with mass 10kg is lifted up to a height of 0.5.m in 2s.**

i. **Calculate the work done**

Work Done = Force x Distance

= 100N x 0.5m

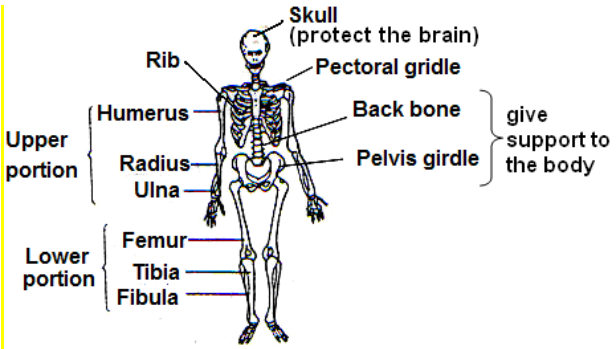
= 50J

ii. **Calculate the power.**

$$\text{Power} = \frac{\textbf{Work}}{\textbf{Time}} = \frac{50}{2} = 25W$$

1. **Support system in animals** (Skeletal system)
   To:
   a. Give support to other parts of the body.
   b. Give shape of the body.
   c. Protect the soft organs in the body.
   d. Enables the body to move.
   e. Produce blood cells.

2. Human Skeletal System maintained by
   i. calcium
   ii. good body positive

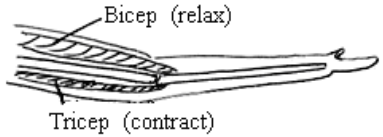


Human Skeletal System

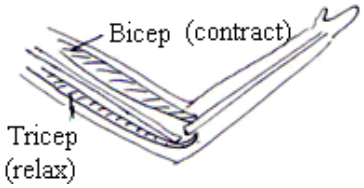
b. **Femur** = the largest bone
   Stirrup = the smallest bone

3. **Bones**
   i. Land vertebrates such as elephant / horse have thick and shorter bones to support its heavy body weight.
   ii. Bird has **hollow bones** which are **stronger** and **lighter** to enable it to fly and for easy movement.
   iii. Hollow bone which has **more surface area** is stronger and lighter than the compact bone.

4. **Movement of arms**
   a. Straighten the arm



   b. Bending the arm.

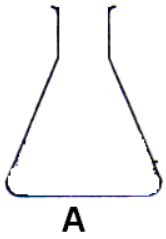


1. a. **Stability of an object affected by 2014**
   i. Height of CG of an object. (height ↓ = stability ↑)
   ii. Base area of an object (broader ↑ = stability ↑)
   iii. Weight of CG of an object

   b. The bench is stable because of **2014**
   - CG Lower
   - Base area wider

2. **Other examples to lower the CG for better stability**
   a. **Giraffe stands with its legs spreads wide apart to increase its base area and lower the CG for a better stability. 2014**
   b. A motorcyclist slants its body when making a bend to lower the CG.
   c. A climber slant forward when climbing a mountain to lower the CG.
   d. Passengers are advised to fill up the seat in the lower deck first in a double decker bus and to be seated in a boat to lower the CG.
   e. The jockey bends his body in a horse-race to lower the CG.
   f. An acrobat spans his hands or holding a long pole when walking on a tight-rope to wider the base area.
   g. An old man using a walking stick or a baby crawling and bicycle with an extra wheels to wider the base area.
   h. Lean the ladder not too close to the wall for wider base area.

3. **Apparatus in the laboratory**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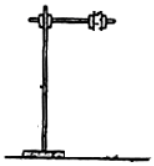
B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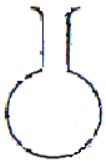
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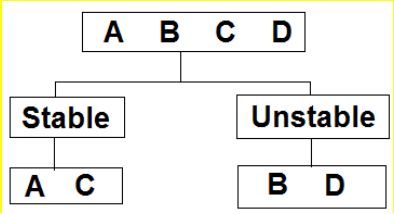


4. **Body builder and martial arts participant can make themselves more stable by:2014**
i. Spreading their legs to widen the base area
ii. Bent their legs to lower the centre gravity.
iii. The wider the base area, the more stable they are.
iv. The lower the centre gravity, the more stable they are.

1. **Harmful substances to the respiratory system from cigarettes smoke**.

i.	**Tar (trickles brown)**	- Kills the cilia in the trachea / blacked the lungs.
ii.	**Nicotine**	- Causes addiction and cancer / harden blood vessels and cause high blood pressure.
iii.	**Carbon Monoxide (same as smoke from car's exhaust pipe)**	- Prevent oxygen from binding with haemoglobin / reduce oxygen to the brain.
iv.	**Carcinogens and toxins**	- Cause cancer
v.	**Acidic oxides** (such as carbon dioxide, nitrogen dioxide and sulphur dioxide gaseous) same as gases from factory.	- Kills the cilia and corrode the trachea. - Damage the lung tissues.

2. **The effect of cigarette smoke on the lungs**

c. Smoking can cause respiratory diseases:

i. **Lung cancer** iii. **Emphysema** v. **Pheumonia**

ii. **Chronic bronchitis** iv. **Heart diseases**

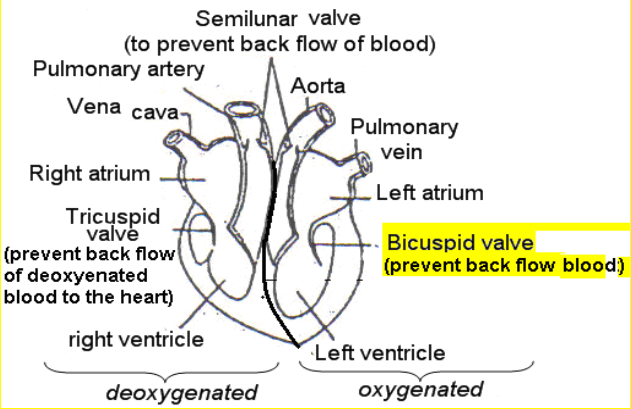
d. Cigarette smoke contains nicotine, a drug which causes a person to feel pleasure. A smoker will feel depressed when not smoking. This will cause the smoker to continue smoking to get the effects of nicotine.

e. **Way to overcome cigarette**

i. educate the public the effect of smoking

ii. increases the price of cigarette to discourage public to smoke

1. Transport System In Human



a. i. **Heart** (blood circulation system)

- **To pump blood round the body.**
- Made up of cardiac muscles. These cells required food and oxygen to carry out activities.

ii. **Important** to maintain a healthy heart

- to prevent heart diseases and maintain the continuous supply of oxygen to the body cells.

iii. Exercise keeps the heart healthy by:

- strengthen the heart muscles
- control the blood pressure.

b. i. **Pulmonary circulation**

Pulmonary artery carries deoxygenated blood from the heart to the lungs while pulmonary vein carries oxygenated blood from the lungs back to the heart.

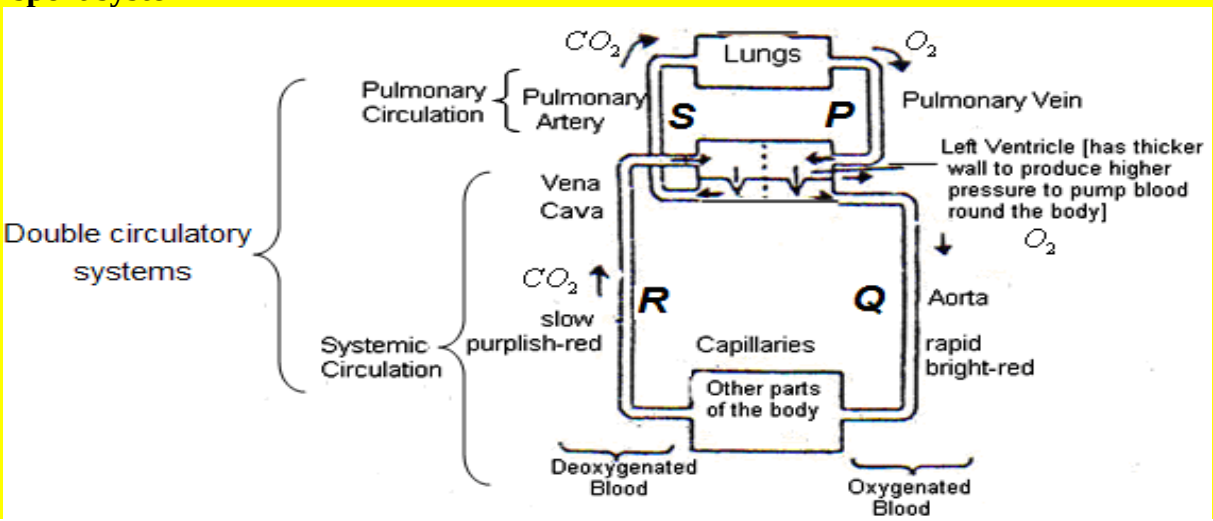
ii. **Systemic circulation**

Artery aorta carries oxygenated blood from the heart to the body's cells while vena cava carries deoxygenated blood from the body's cells back to the heart.

ii. **R → S**: **Deoxygenated blood** flows from the body parts to the heart then up to the lungs.

2. A narrow blood vessel will cause heart attack, hypertension and stoke.
3. The healthy blood vessels can pump a greater amount of blood at faster rate while arrowed blood vessel can pump less amount of blood at slower rate.
4. Patient with narrow blood vessel are advised to
   i. avoid taking saturated fat (lead to high blood cholesterol level and heart diseases)
   ii. eat plenty fruits and vegetables
   iii. take a balanced diet
   iv. Lunch menu: rice, steamed fish / chicken, vegetable, salad / fruit and water.

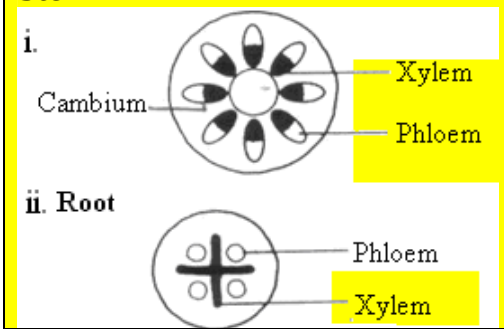
5. Transport system



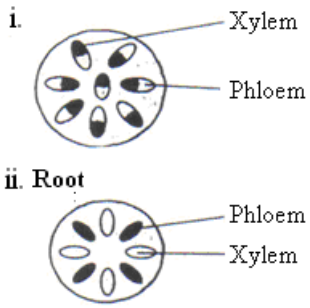
6. **The transport System in plants.**
   a. The **xylems** also absorb water and mineral salts from the roots up to the leaves during transpiration. Xylem also **give support** to the plant.
   b. The **phloem** transports food (glucose) from the leaves down to the other parts of the plant during photosynthesis.

c. The **cambium separates** the xylem and the phloem. It also **builds** new xylem and phloem cells.

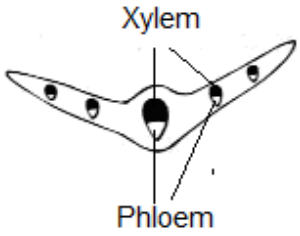
Dicotyledon (Balsam)
Stem



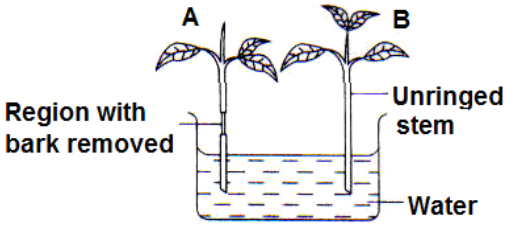
Monocotyledon(Maize)
Stem



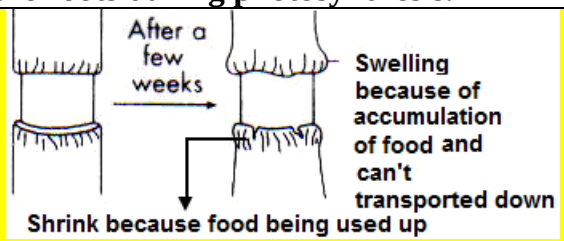
Leaf



7. **Phloem transports food from the leaves down to the roots during photosynthesis.**



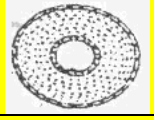
* **Plant B** function as a **control experiment**.
Hypothesis: Phloem transports food.
Variables
Manipulated : ringed or unringed
Constant : type of plant
Responding : condition of the bark.
Conclusion : Phloem transport food from the leaves down to the roots.



Inferences

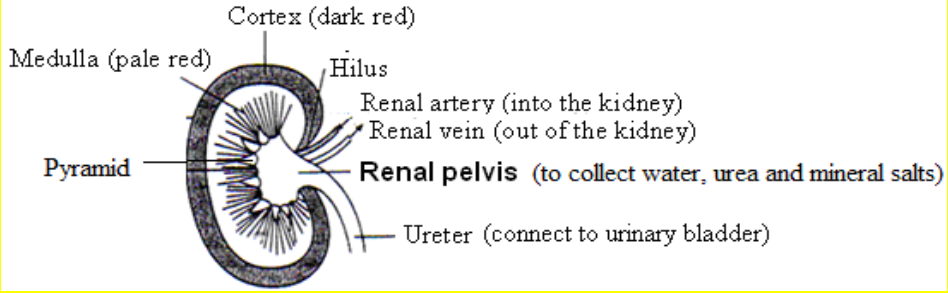
i. The swelling is due to the accumulation of food substances that is unable to be transported downwards as the phloem **has been removed**.
ii. The ringed area is wiped with paraffin to prevent the area from being dried up.
iii. After two weeks, the lower part of the plant die first because the lower part of the plant does not receive food substances.

8. Vein, capillary and artery

i. **Vein**	ii. **Capillary**	iii. **Artery** 2014
		
- big lumen. - thin wall - flow towards the heart. - carry low pressure deoxygenated blood except pulmonary vein. - with valve.	- Very thin wall (one-cell thick) - exchanging nutrients, oxygen / carbon dioxide with body's tissues.**2014** - the smallest vein. - Carry very **low pressure** oxygenated and deoxygenated blood. - Moves very slowly. - diffusion process efficient.	- small lumen. - Thick wall to withstand high pressure. **2014** - flow away from the heart. - carry **high pressure** oxygenated blood (except pulmonary artery). - without valve. - with pulse

9. Valve 2014
- to ensure blood flowing in one direction.
- to prevent backflow of blood

1. Kidney (bean shaped)



d. When body lack of water during fasting , more water will be reabsorbed into the blood and produces more concentrated urine.

e. Volume of urine produced lower on hot sunny day, because the kidney reabsorbs water into blood circulatory system to maintain body hydration.

2. Kidney failure

a. **Kidney defect because of** : i. Diabetes / High blood pressure
ii. Formation of kidney stone.
iii. High intake of salt and sugar
iv. taking drugs and unpre-scribed medicine.

d. Kidney failure will cause water retention in the body.

3. **Complex excretory waste products from plants and their uses**

Excretory product(s)	Source	Use(s)
i. **Tanin**	Bark of mangrove trees, tea leaves	Manufacture of ink.
ii. **Latex**	Stem of rubber trees	Making rubber products such as tyres and shoe, glove
iii. **Volatile oils**	Orange tree leaves, eucalyptus tree, Orange peel, rose petals.	Making oils for aromatherapy or medical use.
iv. **Resin**	Stem of pine trees.	Manufacture of varnish, paint and ink.
v. **Quinine**	Bark of Quinine trees / cinchona tree.	Used in medicine to treat malaria.
vi. **Caffeine, cocaine**	Coffee beans, coca leaves.	Manufacture of drugs for relieving pain.
vii. **Acid**	Mangroves trees, coffee and tea plants.	Used in leather treatment and manufacture of ink.
viii. **Opium**	Poppy fruit.	Making morphine.
ix. **Nicotine**	Tobacco leaves	Cigarette
x. **Ganja**	Cannabis	Relieve pain

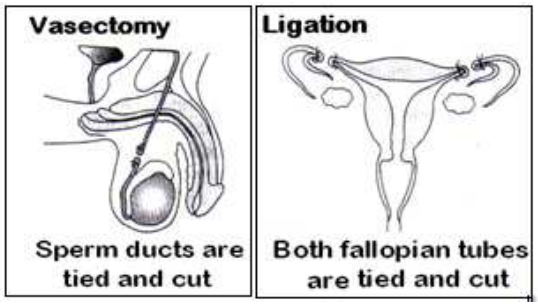
The Important of Pre-natal Care

1. **To ensure that both the expectant mother and foetus are healthy.**
   a. The foetal obtains his source of nutrients from the mother through umbilical cord / placenta.
   b. Therefore, the mother diet must contains:
      i. **Protein** -to build tissues.
      ii. **Carbohydrates and fats** -Provide energy for growing.
      iii. **Minerals**
         - **Iron** to build heamoglobin red blood cells.
         - **Calcium** and **phosphate** to build bone.
      iv. **Vitamins** -Strengthen mother's immune system and health of foetus.
      v. **Folic acid** - for brain development and nervous system.
   c. **Smoking, alcohol and drugs** on the other hand are harmful to the foetus. / damage to the brain cells which can affect the growth of the foetus.
      i. Smoking causes premature birth
      ii. Alcohol causes miscarriage
      iii. Drug causes abnormality to the foetus.

2. **Sterility/ Infertility –** unable to have children / inability to reproduce
   a. **In Man**
      - Low sperms count in the semen.
      - Disorder of testicle.
      - Blockage in sperm duct.
      - Inability to erect
      - Hormone imbalance.
   b. **In Woman.**
      - Inability to release ovum. (no ovulation)
      - Blockage in fallopian tube.
      - Disorder in uterus/ovary.
      - Hormone imbalance.

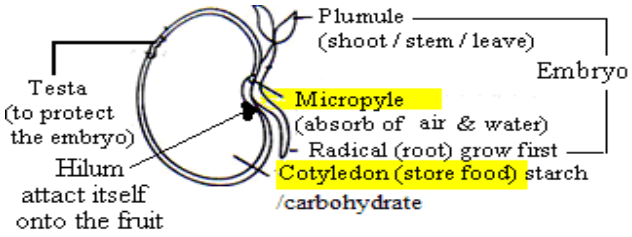
3. **Overcome Sterility / Infertility**
   a. **In vitro fertilization / artificial insemination.**
      - Give injection to stimulate ovum production
      - Retrieving ovum from the women and fertilizing them with sperms in **a dish** and
      - Then the embryo is implanted into the woman's uterus.
   b. **Hormone treatment**
      - Help the inability ovary to release ovum.
      - To increase sperms count
   c. **Surgery / laparoscope**
      - Help to clear blockage in fallopian tube / sperm duct.
   d. **Surrogate mother**
   e. **Rhythmic method** [have sex during **fertile phase** (day 11-17)].

4. **Birth Control Method –** for family planning
   a. In **Woman**
      i. **Contraceptive pills.**
         - To prevent ovulation.
      ii. **Spermicides.**
         - Introduce into vagina to kill sperms.
      iii. **IUD**
         - Inserted into uterus to prevent zygote from **implanting** into uterus.
      iv. **Diaphragms**
         - Rubber cap fitted into cervix to prevent sperm from entering the uterus.
      v. **Tubectomy (permanent)**
         - Legition of both fallopian tubes
      vi. **Natural method (Rythemic Method)**
         - Avoid having sex during fertile phase which is day 11 to 17.
         - Unreliable as the menstrual cycle is not constant.
   b. In **Man**.
      i. **Condom**
         - To prevent sperms from entering vagina / fertilisation.
      ii. **Vasectomy(permanent sterilisation)**
         - Cutting and trying up both sperm duct to prevent flow of sperm.



The Germination of Seeds

1a.



a. The plant will only make food / photosynthesis when the first foliage leaves appear.

Vegetative Reproduction In Flowering Plants

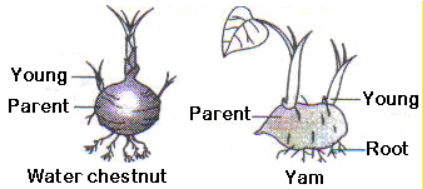
1. **Is an asexual reproduction of plant that grow from parts of the plant,** such as stems, leaves and roots.

a. **Rhizomes**

- **Grow horizontal underground** stems like lalang, ginger, lotus and tumeric.

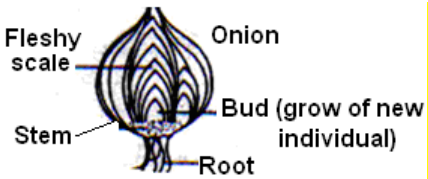
b. **Corms**

- Thick, **short underground stem swollen** with food reserves, like water chestnut and yam.



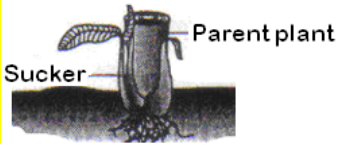
c. Bulbs

- With fleshy **scale leaves.**
- Food is stored in leaves, like **onion** and **garlic**, **tulips**, **lilies**.



d. **Suckers**

- Shoot growing from the stem, like **banana**, **bamboo** and **pineapple plants**.



1. **Minerals – natural elements or compounds that found on earth's crust.** **2014**
   - **The hardness of mineral can be determined by scratching the mineral with finger nail.**

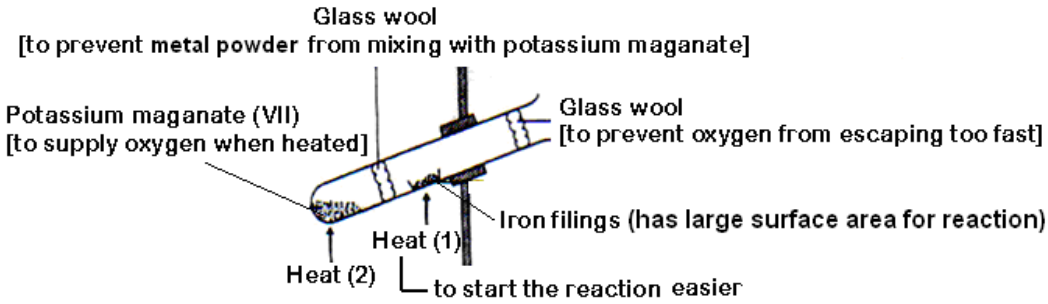
Natural element (non / less reactive)		Metal compounds (combination of metals and non-metals)	
- Mercury	- Platinum	- metal oxide	- metal sulphide
- Silver	- gold	- metal carbonate	

2. Potassium and sodium are reactive metals and store in paraffin oil to prevent them from reacting with water vapour in the air.**2014**

3. **Effect of heat on compound**

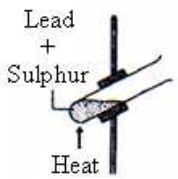
a. **Metal Sulphide + Oxygen** $\xrightarrow{\text{heated}}$ **Metal Oxide + Sulphur Dioxide** **2014**
(All metal carbonate / metal sulphide decompose when heated except potassium / sodium compounds)

4.a. **Metal reacts with oxygen to form metal oxide**
Metal + oxygen ⟶ **Metal** Oxide **(new compound)** **2014**
Iron + oxygen ⟶ **Iron oxide** [new substance reddish-black insoluble]



Variables: 1. **Manipulated**: type of metal 2. **Constant** : Presence of oxygen 3. **Responding** : Reactivity brightness of burning **Hypothesis** The more reactive the metal, the brighter the burning.	**Observation of ascending reactivity:** **Copper → Iron → Zinc → Aluminium** **Inference:** The more reactive the metal, the higher the rate of reaction. **Conclusion:** Different metal has different rate of reaction with oxygen.

b. **Metal react with sulphur to form metal sulphide**
Metal + sulphur ⟶ **metal sulphide (compound)** **2014**
Lead + sulphur ⟶ **lead sulphide** (Galena)



c. **Hypothesis** : **More reactive metals react more actively** / burn brightly with oxygen or sulphur.
d. The compound have different colours to the original metals / not same as original.

5. **Calcium Compounds / Calcium Carbonate**

a. Such as limestone, marble, chalk, stalactites, stalagmites, egg shell, sea shell, teeth, corals, bone and snails shell.**2014**

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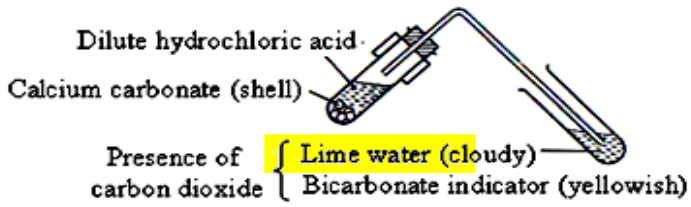
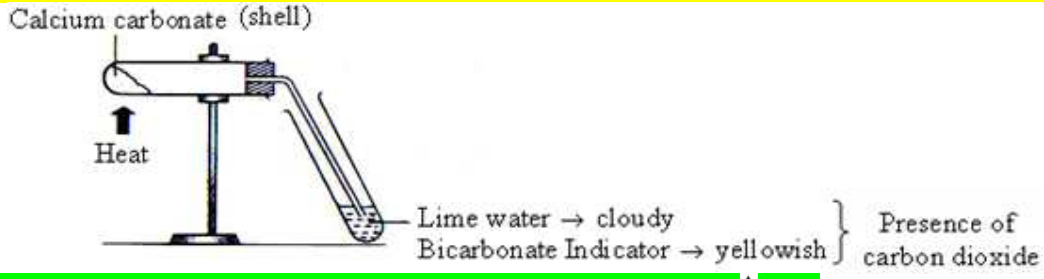
8. **Calcium compound**



a. i. **Calcium Carbonate + Hydrochloric acid → Calcium Chloride + Water + Carbon dioxide**
[limestone] [salt]

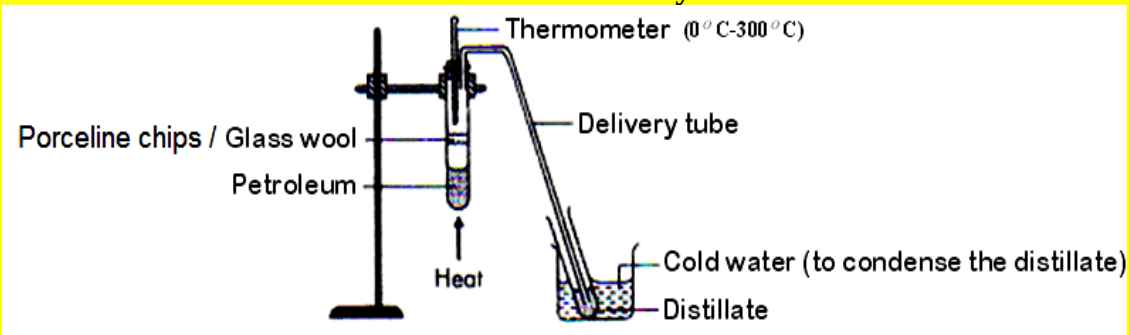
ii. **Calcium Carbonate + Sulphuric Acid → Calcium sulphate + Water + Carbon dioxide**
[limestone] [salt]



b. **Calcium Carbonate** $\xrightarrow{heat}$ **Calcium Oxide + Carbon Dioxide** **2014**
[limestone] [quicklime]

c. **Calcium Oxide + Water ⟶ Calcium Hydroxide + Heat energy 2014**
[quicklime] [a few drop] [slaked lime / alkali] [sizzling sound]

9. a. **A Fractional Distillation of Petroleum in the Laboratory**



i. ***Porcelin chips/Glass wool*** *– to prevent petroleum from spilling out during heating*

	1	2	3	4
Fraction	**Petrol**	**Naphtha**	**Kerosene**	**Diesel**
Temperature range / ˚C	50 - 100	100 - 150	150 - 200	200 - 250
Colour	Colourless	Yellow	Dark yellow	Brownish
Viscosity	Not viscous	Less viscous	Viscous	Very viscous
Colour of flame	Pale yellow	Yellow	Orange	Orange
Soot produced	A little	A little	A lot	A lot

b. **The higher the boiling point of the fractions:**
- The darker the colour
- The more viscous it is
- The harder it is to burn with a **darker** flames
- The more soot is produced during burning

c. **To study the effect of boiling point on the colour of the distillate**

Hypothesis : The higher the boiling point, the darker the colour of the distillate. **Relationship:** The colour of the distillate become darker with the boiling point. **Variables** Manipulated: boiling point Constant : volume of the petroleum	**Responding**: colour of the distillate **Inference** : Higher boiling point produces darker colour of the distillates. **Conclusion** : The boiling point affects the colour of the distillates.

10. **Fractional Distillation of Petroleum in Industry**

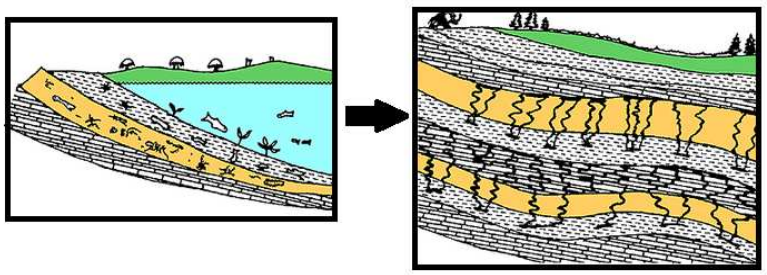
a. **Various fractions can also be used to make**
   i. Synthetic materials such as plastic, nylon, rayon, and synthetic rubber.
   ii. Chemical substances such as fertilizers, explosive, pesticides, cosmetics, and detergent.

11. **Natural gas**
   i. Usually found above the petroleum in the ground.
   ii. It is a mixture of hydrocarbon gases with low boiling points.
   iii. About 90% of natural gas is **methane** follow by ethane, **butane** (Malaysia) and propane
   iv. Burns completely, producing more energy but less soot.

12. **Coal** - burns in air to produce energy and a lot of soot,

13. Ways to conserve natural source of energy.
a. Use alternative energy such as wind, solar, water or biomass.
b. Use public transport.
c. RON 97 more expensive but cause less pollution than RON 95
d. use hybrid car (energy saving & no polution)

14. **Petroleum 2014**



a. Formed from the remains of living things that here decomposed million years ago.**2014**
b. Consists of a mixture of hydrocarbons.
c. Hydrocarbon is made up of carbon and hydrogen atoms only.
d. Different components of petroleum (hydrocarbons) can be separated by **fractional distillation** because different components has different boiling points.
e. All components are insoluble in water but burn easily in air.

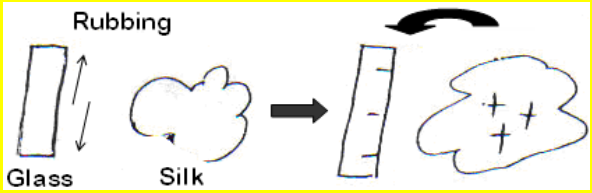
15. Petroleum industry has helped 2014
- To create more job opportunities and attract foreign investment.
- To build the country's socio-economy infrastructure
- Is one of Malaysia's main exports.

16. **Natural fuel resources 2014**
- exist naturally in the earth
- derive from animals and plants

Electrostatics

1. Electrostatics

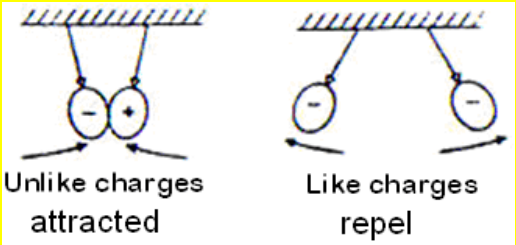
a. Is static electricity due to rubbing friction of two different insulators.



b. It becomes **positive charges** when loss of electrons are removed like glass, fur, ruler and hair.

c. It becomes **negative charges** when receive electrons like silk, polythene, balloon and ebonite or plastic comb.

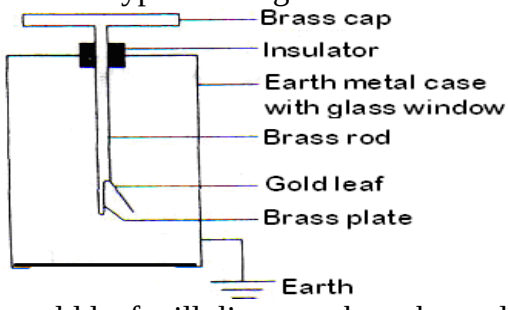
d.



2. Electroscope

a. To detect small charges

b. To test the type of charges



c. The gold leaf will diverge when charged object brought near the brass cap.

a. The gold leaf will close when the charged object and electroscope have different charges.

b. The gold leaf will diverge further when charged object and electroscope have same charges.

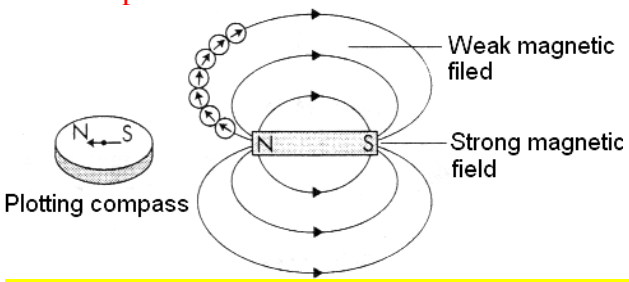
3. Magnetism

a. Magnet can attract iron, cobalt, nickle and steel.

b. When hung freely by a thread, a bar magnet always point to north and south of the earth.

c. Compass has a magnetized needle which is fixed at centre of gravity.

d. The magnet needle always point to the Northpole of Earth.



c. Magnetic field

- place around a magnet where its magnetic force acts.

d. Factors affect the patterns of magnetic field:

i. The arrangement of magnet

ii. The strength of magnets

e. Magnet field lines always

i. Begin from north pole to the south pole

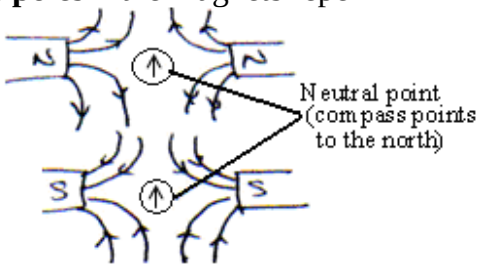
ii. No two lines can cross or touch each another.

iii. The magnetic field lines is more and close together at the poles of the magnet because the magnets field is stronger.

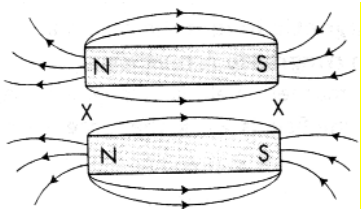
iii. **Like poles** = the magnets repel

a.

b.

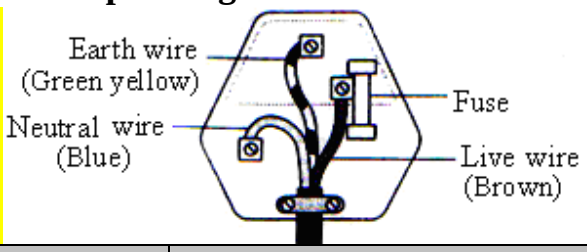


c.



i. **Unlike poles** = the magnets attracted

1. **Three-pin Plug**



a.**Wire**	**Description**
i. **Live wire (**brown) **code 'L'**	- Carries current from the branch substation to the electrical appliance
ii. **Neutral wire (blue) code 'N'**	- Carries current from the electrical appliance back to the branch sub substation
iii. **Earth wire (yellow green) code ' E'**	- Carries leaking current from metal body of electric appliance down to the earth - such as oven, refrigerator and washing machine. - such as TV or computer do not have earth wire.
iv.**Fuse** (made up by tin or lead) with high resistant and low melting point - connect to the live wire for safety	- Melt and cut off the circuit when there is large/excess current flow or a short circuit occur - Prevent electrical appliances from getting spoilt - to prevent excessive current

b. **Earth wire** and **fuse wire** are safety devices. **(prevent us from electric shock)**

c. If large current or short circuit will occur, the fuse will melt and cut off the circuit. The electrical appliances will not spoilt.

d. If a person get electric shocked.

i. do not touch victim so not to get electrocuted as well.

ii. switch off electrical source immediately

iii. Bring victim to hospital

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1. Modern technologies used for space exploration

a. Space shuttles

- It can be reused for future missions

b. Space telescopes 2014

i. **Hubble Space Telescope** is used to observe the galaxies and phenomena of outer space.

c. Space probes 2014

i. **Space probes** are robots that are sent from Earth to explore far away planets.

ii. In 1969, America sent three astronauts to the Moon on board Apollo II..Neil Armstrong and Edwin Aldrin were the first two men to step on the Moon.

2. Benefits of Technology in Outer Space to Man 2014

a. To understand more about universe

b. To improve the quality of life.

c. **Communication Satellite** enables us to receive live telecast, satellite TV and telecommunication and using internet.

d. **Weather Satellite** detect natural disaster, pollution and weather forecasting **2014**

e. **Environment Satellite** searching for natural resources **2014**

f. **Military Satellite** improve national defense and security system **2014**

g. **Global Positioning System Satellite** to direct ships, aircraft or vehicles.**2014**