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Unit (1):-

Matter:-

Lesson (1):- Measuring tools:-

Matter: - It is everything that has a mass & occupies a space (volume).

Q1 - What is the matter?

Q2 - Define the matter.

Q3 - Matters are similar in having,.....

Q4 – Writ the scientific term:-

-Every thing that has a mass & occupies a space (volume).

Q5 - Give reason:-

-A glass is a matter.

- A water is a matter.

- An oil is a matter.

Mass: - It is the amount of matter in an object.

Volume: - It is the space occupied by matter.

Q1 - What is the Mass?

Q2 - Define the Mass.

Q3 - What is the Volume?

Q4 - Define the Volume.

Q5 – Writ the scientific term:-

- The amount of matter in an object.

- The space occupied by matter.

Q6 - Give reason:-

-The T.V has a volume.

Q7 - The amount of material that the object contains is

	<u>Measuring tools.</u>	<u>Measuring units.</u>
<u>1) Length.</u>	<ul style="list-style-type: none"> - Measuring ruler. - Graduated tape. 	<ul style="list-style-type: none"> -1kilometer =1000 meters. (Km) (m) -1meter = 100 centimeters. (m) (cm)
<u>2) Mass.</u>	<ul style="list-style-type: none"> - Common balance. - Sensitive balance. 	<ul style="list-style-type: none"> -1 ton = 1000 kilograms. (kg) -1 kilogram = 1000 grams. (kg) (g)
<u>3) Volume.</u>	<ul style="list-style-type: none"> - Graduated cylinder. It is used to measure the volumes of: -liquids such as water, oil...etc -An irregular solid body. - Measuring ruler. It is used to measure the dimensions of a regular solid body. 	<ul style="list-style-type: none"> - Solids :- <ul style="list-style-type: none"> - Cubic meter (m^3). - Cubic centimeter (cm^3). - Liquids :- <ul style="list-style-type: none"> - Liter (L). -cubic meter (m^3). - Milliliter (ml). - Cubic centimeter (cm^3). <p>Liter =1000 ml = 1000 cm^3.</p>

Q1 -is used to estimate Volume of Liquids.

Q2 - From units of Mass are &

Q3 - 2 Kg = Grams.

Q4 - Meter is the unit of Measuring But (Kg) is the unit of

Q5 - The graduated ruler is used to measure

Q6 – Uses of:-

-Measuring ruler

-Sensitive balance

- Graduated cylinder

- Graduated tape

- Common balance

- The centimeter (cm).....

- The meter (m).....

- The kilometer (km).....
- The gram (gm).....
- The kilogram (kg).....
- The ton.....
- The liter or milliliter.....
- The cubic meter (m^3) or cubic centimeter (cm^3).....

Q7 -is used to measure small length, whilemeasure large length

Q8 - 3 meters =Cm.

Q9 - We estimate the Mass of chemical materials & gold by using

Q10 - the Mass of fruit is measured by but Mass of Jewelry by

Q11 - The types of balances are &

Q12 - 2 Liters = cm^3 .

Q13 - Liter is the unit of measuringof the liquids.

Q14 - Join (A, B)

A	B
1) Ton	a) Occupies 1000 cm^3 .
2) Gram	b) 1000 Kg.
3) Liter	c) Unit of Mass.
4) Kg	d) A space occupied by a cube of side length = 1Cm.
	e) 1/1000 of Kg.

Q15 - Write the scientific term:-

- A unit of measuring small lengths.
- A device of measuring small mass as gold and silver.
- A device used to estimate volume of liquids & irregular solid body.
- A unit of measuring small mass.

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Estimating volumes of matter:-**Estimating volumes of solid:-****Regular solid:-**

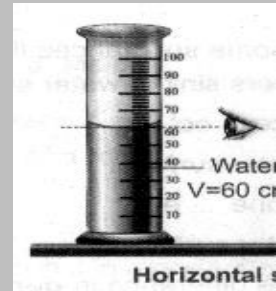
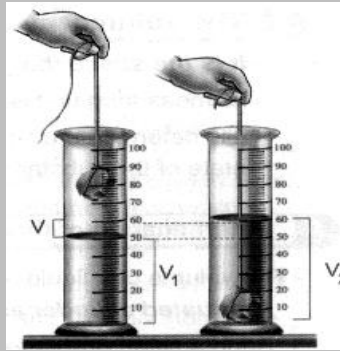
$$\text{Length} \times \text{Width} \times \text{Height} = \dots \text{cm}^3.$$

Irregular solid:-

- 1) Put a quantity of water in graduated cylinder.
 - 2) Record the level of water (V1).
 - 3) Put irregular solid.
 - 4) Record the new level of water (V2).
- So: - The volume = $V_2 - V_1 = \dots \text{cm}^3$

Estimating volumes of liquid:-

- 1) Put the liquid in graduated cylinder.
- 2) Record the level of liquid.



On reading the measuring cylinder, the vision must be in a horizontal position at the bottom point of water level .



Equal volumes of different substances have different masses.



When body is submerged completely in a cylinder full of a liquid the liquid is spilled.
So the volume of the body = the volume of the spilled water.

Q1 - volume of the brick (cuboid) = X X

Q2 - Write the scientific term:-

-Length X width X height.

Q3 – Equal volumes of.....substances have.....

Q4 - If the volume of water = 100 Cm^3 , After adding a stone the volume of water becomes 120 Cm^3
Calculate the volume of the stone?

Q5 - A glass is filled with water and (10 equal-sized) marbles are added to it. Calculate the volume of each marble if the volume of the poured water = 20 Cm^3 .

Q6 - Explain practically:-

- How to estimate the volume of an amount of water or any liquid?
- How to estimate the volume of a marble or stone or irregular solid?

Q7 - Give reason:-

- When some pieces of stone are put (submerged) completely in a glass full of water, an amount of water is spilled out of the glass.

Q8 – What happens when: -

- A body is submerged completely in a cylinder of a liquid.

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Lesson (2):- Matter states & its changes:-

<u>According to the properties the States of matter are three:-</u>			
	<u>Solids</u>	<u>Liquids</u>	<u>Gases</u>
<u>Example</u>	Iron – wood – glass.	Water – oil – milk.	Air – oxygen – water vapor.
<u>Properties (shape &volume)</u>	Solids have definite shape & definite volume.	Liquids have definite volume but its shape changes according to the container (indefinite shape).	Gases shapes & volumes are changing according to the container (indefinite shape & volume).

Q1 - Give reason:-

1. Salt is solid while oil is liquid?
2. Air is a gaseous matter?
3. The shape of water inside the cylinder differs from its shape inside the conical container?
4. Milk is a liquid matter?
5. Wood has a definite shape and volume?
6. On putting a mixture of gravels and water in a refinery with minute holes water passes while gravels remain in the refinery?
7. Oxygen has indefinite shape and volume?

Q2 - What happens?

1. When an amount of milk is poured from a graduated cylinder into a test tube?
2. When you put three equal amount of water in three different containers?
3. When you blow air in different balloons?

Q4 - Write the scientific term:-

1. A state of matter that has definite shape &volume.
2. A state of matter that has indefinite shape &volume.
3. A state of matter that takes the shape of the container only.
4. A state of matter that takes the shape & the volume of the container.

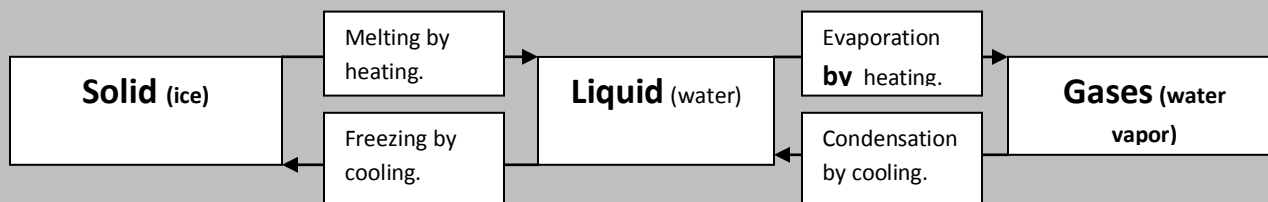
Q5 – complete:-

1. The states of matter are ,and
2. Iron hasstate at ordinary Temp. But water is
3.substances have definite shape & volume.
4. Liquids have definite & indefinite
5. On transferring water from one container to another its shape will
6. Molecules ofare very closed, but in are very far.
7. Matter can be pressed in case of itsstate.
8. When we pour water from container (A) into (B) , then into (C) ,the
 - a. Volume of water in container (A) is
 - b. Shape

Changes of matter according to heating & cooling :-

- Matter exists in only one state at the ordinary room temperature.
- Matter can be changed from one state to another by heating or cooling.

	<u>Solids</u>	<u>Liquids</u>	<u>Gases</u>
<u>Melting :-</u>	It s the change in a matter state from solid to liquid by heating .		
<u>Evaporation :-</u>		It s the change in a matter state from liquid to gas by heating .	
<u>Condensation:-</u>		It is the change of matter from the gaseous state into the liquid state when cooling .	
<u>Freezing :-</u>	It is the change of a matter from liquid into solid by cooling .		



Q1 - Give reason:-

- 1) Ice change into water if a beaker of ice exposed to air?
- 2) On making tea water drops are formed on the cover of a teapot from inside?
- 3) Water freezes when it is put in the freezer?
- 4) The decrease in the amount of water in a teapot when it is boiled for some time?
- 5) Formation of water drops on the outer surface of a bottle filled with ice?
- 6) The washed clothes become dry after exposing them to the heat of the atmosphere?
- 7) Gaseous matter is compressed and packed in cylinders?
- 8) A piece of copper has a definite shape when we carry it from a vessel to another one?
- 9) The glass bottle which is put in the freezer of the refrigerator should not be full of water?

Q2 - What happens?

- 1) When you put pieces of ice in a pan and heat them?
- 2) When you put a cold sheet of glass over a container containing water vapor coming from boiling water?
- 3) When a bottle of water is put in freezer?
- 4) When you take out a bottle of water from the fridge and leave it a while?
- 5) If we leave a glass filled with ice in air?
- 6) If you boil water and expose product to a cold surface?

Q3 - What the meant by or define:-

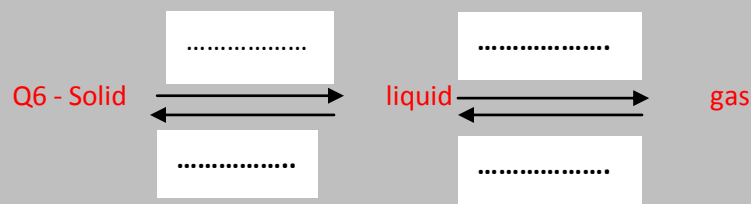
- a. Melting.
- b. Condensation.
- c. Evaporation.
- d. Freezing.

Q4 - Write the scientific term:-

- 1) The change of matter from solid to liquid by heating.
- 2) The change of matter from liquid to gas by heating.
- 3) The change of matter from gas to liquid by cooling.
- 4) The change of matter from liquid to solid by cooling.

Q5 - Complete:-

- 1) When the solid, it becomes liquid.
- 2) Water vapor changes into by
- 3) If a liquid freezes, it becomes
- 4)is the solid state of water.
- 5) Water condenses if it touchessurface.



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Lesson 3 :- Elements around us :-**The element:** - It is the building unit of matter. And it is the simplest form of matter

That cannot be decomposed into two substances or more.

Q1 – What is the element?

Q2 – Define the element?

Q3 – Give reason:-

-Sulphur is an element?

Q4 - Write the scientific term:-

- It is the building unit of matter. And it is the simplest form of matter

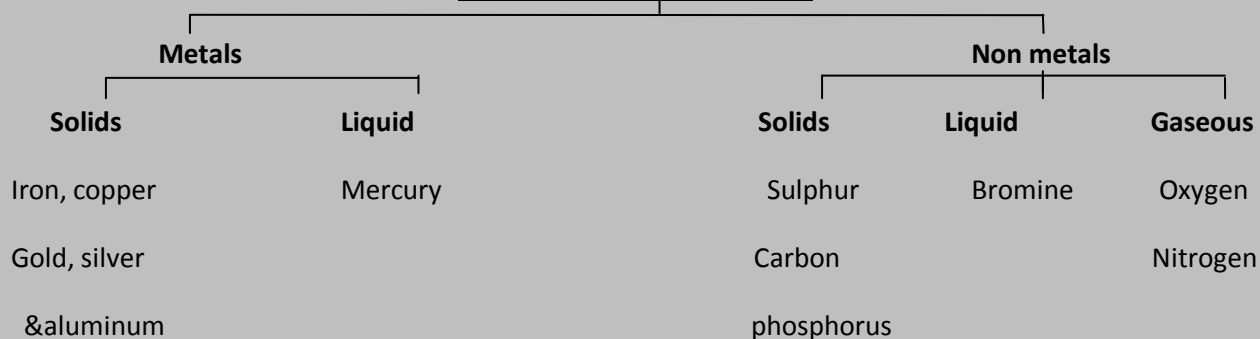
That cannot be decomposed into two substances or more.

Q5 – All the materials you see in your environment are made up of.....

**The number of elements:** - 112 elements divided into.

a) Natural elements: 92 elements.

b) Artificial elements: 20 elements.

**The element is consists of smaller particles known as molecules & molecules are consists of atoms.****An element contains one type of atoms which are different from the atoms of other elements.****Classified the elements into:-**

Q1 – Complete:-

1. Copper, iron, oxygen & are examples for
2. Iron, copper, aluminum, gold, silver & lead are examples for

3. Mercury is an example for
4. Sulphur , carbon & phosphorus are examples for
5. Bromine is an example for.....
6. Oxygen and nitrogen are examples for

<u>Properties of elements :-</u>		
	<u>Metals:-</u>	<u>Non metals:-</u>
1 – Luster (shiny):-	Have luster.	Have not luster.
2 – Conductivity of electricity:-	Good conductors.	Bad conductors except Carbon.
3 – Conductivity of heat:-	Good conductors.	Bad conductors.
4 – Melting and boiling points:-	High.	Low.
5 – Malleability:-	Malleable (can be hammered, pulled & bent).	Not malleable (cannot be hammered, pulled & bent).
6 – The state at room temperature:-	Solids except mercury (liquid).	Solids, liquids, gaseous.
7 – Example :-	Iron, Copper, Gold, Silver, aluminum & Mercury.	Sulphur, Carbon , phosphorus, Oxygen& Nitrogen

Q1 – what is the metals?

Q2 – what is the non metals?

Q3 – Define:-

1. Metals.
2. Non metals.

Q5 - Write the scientific term:-

1. A group of elements having luster, good conductors of electricity and heat , high melting point , malleable and ductile , all of them are solids except mercury which is a liquid.
2. A group of elements that does not have luster, bad conductors of heat and electricity except carbon , low melting point ,not malleable and ductile .

Q4 – Complete:-

1. The group of elements that have luster is known as.....
2. The group of elements that does not have luster is known as.....
3. All non metals elements are bad conductors for electricity except
4. All metals are solid exceptis
5. The group of elements that have high melting & boiling points is known as.....
6. The group of elements that have low melting & boiling points is known as.....

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<u>1 – Luster (shiny):-</u>		
<u>The object.</u>	<u>The element.</u>	<u>Luster.</u>
Nails.	Iron (metal).	Have luster.
Lock.	Cooper (metal).	Have luster.
Spoon.	Aluminum (metal).	Have luster.
Coal.	Carbon (non metal).	Have not luster.

<u>2 – Conductivity of electricity:-</u>		
Using: - Battery (dry cell)-Electric wires – Lamp-The following objects.		
Steps: - Set up electric circuit by using different objects.		
Observe: - The light of lamp in each case.		
<u>The object.</u>	<u>The element.</u>	<u>Conductivity of electricity:-</u>
Tip of pencil.	Carbon (graphite)	Good conductors (non metal).
Fork.	Iron.	Good conductors (metal).
Coin.	Cooper.	Good conductors (metal).
Foil paper.	Aluminum.	Good conductors (metal).
Sulphur column.	Sulphur.	Bad conductors (non metal).

Q1 - Give reason:-

1. Iron and copper are metals?
2. Sulphur is considered as non metal?
3. Gold and silver are used in making jeweler?
4. Copper is used in manufacture of electric wires?
5. Aluminum can be bent or hammered, but the piece of coal (carbon) cannot be?
6. Cooking pans are made of Aluminum?
7. Handles of cooking pots are made of wood or plastic?
8. Carbon is non metal although it is used in making the electrode of dry cell?
9. When making an electric circuit with a foil paper the electric lamp lights but when making an electric circuit with Sulphur crystal the electric lamp doesn't light?
10. Aluminum is considered as a metal but bromine is a non metal?
11. We mustn't approach a nail to an electric source?
12. The melting point of iron nail is higher than that of Sulphur crystals?
13. Copper is used in making status and metallic coins?
14. Car chassis, doors and bridges are made of metals not of non metals?
15. The electrician stands on wooden chair when he makes some electrical repairs?
16. Iron is used in making lamp posts?

Q2 - What happens if?

1. You connect a graphite rod of a pencil with a circuit having an electric lamp and why?
2. You put a piece of wax at one end of Sulphur bar and expose the other to a candle flame and why?
3. You heat a piece of copper and some crystals of Sulphur to high temperature?

4. You fix a piece of wax at one end of an iron bar and expose the other to a candle flame and why?
5. The handles of cooking pots are made of Aluminum and why?
6. You connect some Sulphur crystals with an electric circuit that has a lighted lamp and why?

Example of used elements (metals & non metals):-	
<u>Elements:-</u>	<u>Used:-</u>
Iron.	Cars frames – Bridges – Door – Lampposts.
Aluminum.	Cooking pots – Foil paper.
Cooper.	Statues – Coins – Electric wires.
Gold & Silver.	Jewels.
Carbon (graphite).	Positive poles of dry cells (Batteries).

Q1 – use of:-

1. Iron.
2. Aluminum.
3. Cooper.
4. Gold & Silver.
5. Carbon (graphite).

Q2 – complete:-

1. We use.....in manufacturing jewels.
2. We use.....in manufacturing bridges.
3. Poles of electric cells are made up of..... .

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Lesson (4):- Physical & Chemical changes :-

<u>1- Physical Change:-</u>	<u>2- Chemical Change:-</u>
It's the change in the shape and appearance of the matter without any change in its structure or properties .	It's a change in the structure of the substance producing new substance with different properties.
<u>Examples:-</u> 1. <u>Ice cycle :-</u> Ice $\xrightarrow{\text{melting by heating}}$ Water $\xrightarrow{\text{evaporation by heating}}$ Water vapor $\xrightarrow{\text{condensation by cold surface}}$ Water $\xrightarrow{\text{freezing}}$ Ice . So change of Ice to Water then change water to water vapor then change water vapor to water then change water to ice is a physical change (the shape change) without structure change. 2. <u>Melting of wax:-</u> Solid wax (candle) $\xrightarrow{\text{melting by burning(heating)}}$ melt wax (liquid) $\xrightarrow{\text{by glasses}}$ melt wax change into solid wax . So change of solid wax to liquid wax then to solid wax again is physical change (the shape change) without structure change. 3. <u>Grinding of sugar:-</u> Sugar cub $\xrightarrow{\text{grinding by mortar}}$ sugar cub change to powder but the sweetly taste of sugar does not change. So change of sugar is physical change (the shape change) without structure change. 4. <u>Dissolution of table salt (or sugar) in water:-</u> Table salt (solid) $\xrightarrow{\text{dissolve in water by stirring}}$ dissolving salt in water $\xrightarrow{\text{by heating}}$ the water is evaporated & salt formed again. So change of salt is physical change (the shape change) without structure change. <u>Other examples for physical change of matter:-</u> <ol style="list-style-type: none"> 1. Melting of any solid matter as chocolate, wax and ice. 2. Malleability, ductility and bending of elements. 3. Grinding chalk into powder. 4. Freezing of any liquid matter. 5. Evaporation of water forming water vapor. 6. Paper recycling. 	<u>Examples:-</u> 1. <u>Burning of sugar:-</u> Spoon sugar $\xrightarrow{\text{burning by heating}}$ burning sugar . So by heating the white sugar change into brown color & sugar loses its sweetly taste & it cannot be returned to normal shape and taste. So Burning sugar is a chemical change as the shape and structure. 2. <u>Burning of paper:-</u> White paper $\xrightarrow{\text{burning by flame}}$ burning paper. So by burn white paper change to black substance & it cannot return to normal shape and color. So Burning paper is a chemical change as the shape and structure of white paper change. 3. <u>Iron rust:-</u> Iron wire $\xrightarrow{\text{leave it in the wet air}}$ iron rust formed. So when leave iron wire in wet air a brittle brown layer is formed on the iron wire is called (rust) cannot return to normal color .So rusting of iron is a chemical change as the shape and structure of iron wire change. <u>Other examples for chemical change of matter:-</u> <ol style="list-style-type: none"> 1. Fermentation of fruits. 2. Fermentation of sugar. 3. Burning of any matter as a candle or wood. 4. Addition of yeast to pastry. 5. Production of yoghurt from milk. 6. Digestion of food. 7. Photosynthesis process.

- ⇒ Melting of a candle is a physical change, while burning of a candle is chemical change.
- ⇒ Rusting of iron is formed due to the reaction between iron and both oxygen and water.
- ⇒ Melting of iron is a physical change as its structure does not change.
- ⇒ Comparison between the physical change and the chemical change:-

	Physical change	Chemical change
Change in shape.	changing	changing
Change in structure.	No changing	changing

Q1 – What is a Physical change?

Q2 – What is a Chemical change?

Q3 – Define a Physical change.

Q4 – Define a Chemical change.

Q5 - Write the scientific term:-

1 - It's the change in the shape and appearance of the matter without any change in its structure or properties.

2 -It's a change in the structure of the substance producing new substance with different properties.

Q6- Give reason:-

1. Dissolving salt in water is considered physical change?
2. Melting of ice is a physical change?
3. Melting of wax is a physical change?
4. The change of water into ice is a physical change?
5. Burning of paper is considered a chemical change?
6. Burning of wood is considered a chemical change?
7. Formation of a layer of rust on the surface of wet iron wire?
8. Changing the sugar flavor after heating it strongly on a burning spoon?
9. Fermentation of milk is a chemical change?
10. Burning a piece of sugar is considered a chemical change?
11. Sugar keeps its flavor after dissolving it in water?
12. A black substance is produced after burning a piece of paper?
13. Formation of clouds and rains is a physical change?
14. Burning a piece of bread is a chemical change?
15. Rusting of iron is considered a chemical change?

Q7 - What happens if?

1. Water evaporates from a salty solution?
2. We expose a cold glass sheet to water vapor?
3. We burn a piece of paper?
4. We heat a piece of ice strongly?
5. Adding yeast to dough's then baking .why?
6. Putting a piece of dry iron wire in a jar filled with dry oxygen .why?
7. We heat a piece of sugar strongly? A chemical change takes place and a brown substance is formed.
8. We put a bottle of water in the freezer for a day?
9. A bright shiny iron nail is moistened and exposed to air?
10. We grind sugar into powder .why?
11. We bend an iron sheet. Why?

Q8 – Complete:-

1. The changes that may occur to matter are&.....
2. Melting of a candle is a , while burning of a candle is
3. Rusting of iron is formed due to the reaction between and both..... and
4. Give examples on a Physical change.

.....

.....

5. Give examples on a Chemical change.

.....

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Lesson (5):- Chemical changes applications:-

<u>Combustion :-</u>	<u>Rust :-</u>
It is a Chemical change happens as a result of the presence of a plenty of oxygen in air and increasing temperature of burning substances to its ignition point.	Iron rust is a chemical change .occur when iron is left in wet (humidity) & air (oxygen). Chemical change is a brittle brown layer from a new substance (iron oxide) is formed.
Ex:- Fuel $\xrightarrow{\text{combustion}}$ Energy + harmful substances. <div style="text-align: center;"> ex. ↓ (carbon dioxide) </div>	Ex:- Iron $\xrightarrow{\text{rusting by wet \& air}}$ brittle brown layer (iron oxide) is formed (iron rust)
<u>Factors effected on combustion process :-</u> <u>1-Ignition point .(temperature):-</u> - Each substance has ignition point at which burning happens. - Combustion happens by increase of temperature of burning substances to reach ignition point. - Ex.:- Using friction & sun rays to increase of temperature of burning substances to reach ignition point. <u>2- Oxygen :-</u> -Plenty of oxygen is necessary for combustion occurrence. <u>3- The combustible substances :-</u> - The Combustion needs combustible substances to occur. <u>The fires :-</u> Fires start small then increase due to increase of temperature, Plenty of oxygen & a combustible substances. <u>To extinguish fires we use :-</u> - Water to decrease the temperature of fire. - Sand & heavy cover to separate air from the fire. - Using fire extinguishers. Carbon dioxide does not burn & does not help in burning .So that, it's used in an extinguishing fires.	<u>Factors effected on iron rust formation :-</u> <u>1-Air (oxygen):-</u> <u>2- Wet(humidity):-</u> <u>So:-</u> ➡ We store iron in dry places. ➡ Iron rusts due to the presence of Oxygen & Humidity. ➡ <u>Harms of iron rust :-</u> 1-Destory a huge number of buildings, bridges & machines. ➡ <u>Protection of iron from rust (separation of iron) :-</u> -by separating iron from wet air by :- 1-coating the outer surface by painting. 2-adding another metals to iron as Chromium & Nickel in order to produce stainless iron such as stainless steel. 3-Coating iron by a layer of Zinc.

Q1 – What is the Combustion?

Q2 – What is the Iron rust?

Q3 - Factors effected on combustion process are&.....

Q4 - Factors effected on iron rust formation&.....

Q5 - Give reason:-

1. We store iron in dry places.
2. Separation of iron.
3. To extinguish fires we use water.
4. To extinguish fires we use Sand & heavy cover.
5. Coating the outer surface by painting.
6. Adding another Metal to iron as Chromium & Nickel in order to produce stainless iron such as stainless steel.
7. Coating iron by a layer of Zinc.

Q6 – What is meant by?

1. Combustion.
2. Iron rust formation.
3. Protection of iron from rust (separation of iron).
4. Ignition point.