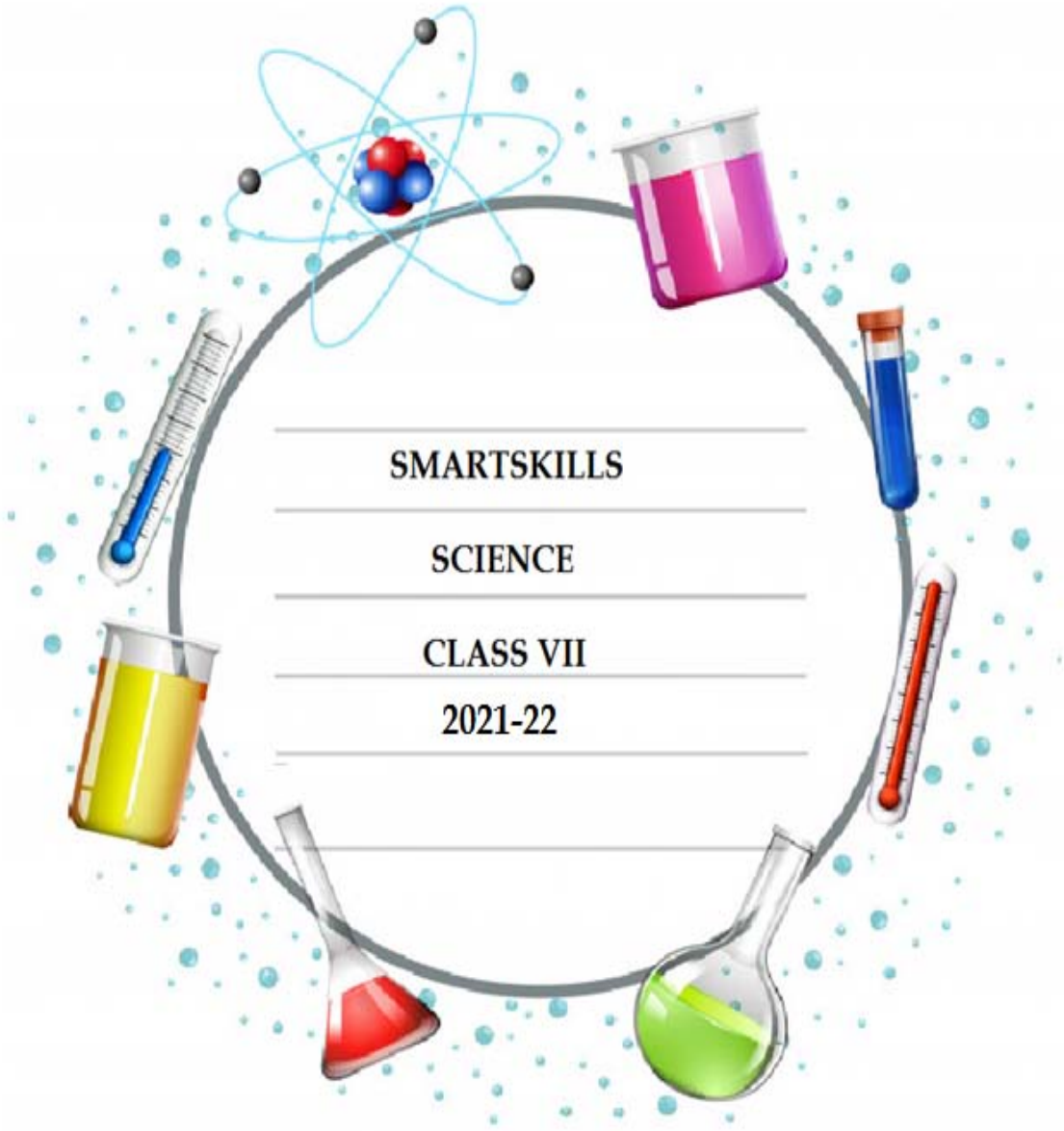


SMARTSKILLS

SCIENCE

CLASS VII

2021-22

KEY FEATURES OF SCIENCE SMART SKILLS

This edition is enriched with activities, quizzes, crosswords, multiple choice questions, in-text questions etc. to check the child's grasp of the concept.

The **H.O.T.S.** (High Order Thinking Skills) questions will help in developing child's logical and analytical thinking and will greatly enhance the development of independent thinking skills.

The activities will help to focus child's attention on the concept to follow and explain and reinforce the scientific concepts.

The **LET US DO** sections have activities like research, group work, peer work etc which will help the child to apply the concepts of science.

The **Smart notes** contains scientific facts and summary of the chapters. This will help in creating awareness among the students about the world of science as well as strengthen the grasp on the concepts.

Last but not the least – This smart skill has been prepared to help the children develop a scientific aptitude by

- Reinforcing concepts
- Strengthening expression
- Developing independent thinking
- Understanding the reasoning of day to day phenomena

CONTENTS

Syllabus- Physics and Chemistry
CLASS – VII
2021-22

Text book – Science textbook for class VII (NCERT)

April-MAY
Heat (Physics)
Concepts – Heat – A form of energy, Units of heat, Hot and cold objects, Hot and cold are relative, Temperature, Thermometers, least count, Transfer of heat – Conduction, Convection and Radiation, Conductors and Insulators.

Activities:
- To experience that hot and cold are relative.
- Demonstrations of conduction, convection and radiation
- Reading a thermometer – differentiating between laboratory and clinical thermometer
- Understanding least count and be able to calculate least count
- Conductors and insulators
- Demonstrations to show difference in conductivity of substances

Physical and chemical changes (Chemistry)

Concepts- Identification of Physical changes, Chemical changes

Activities:
- Various physical and chemical changes to be demonstrated
- caramelization as a chemical change
- cooking as a chemical change

JULY- AUGUST
Physical and Chemical Changes (Chemistry)
Concepts: Burning of magnesium ribbon , Rusting of iron, Crystallization.
Writing word equations on the examples of chemical changes as given in the chapter.

Activities:

- To demonstrate Rusting of iron and how to prevent it
- To show the change in the colour of copper sulphate solution when iron is put in the solution.
- magnesium ribbon burning
- zinc reaction with HCl to form hydrogen gas bubbles will be shown
- lime water turning milky

Motion and Time (Physics)
Concepts – Types of motion, Speed of moving objects – slow or fast, Uniform and non uniform motion, Measurement of time using periodic events, Units of time and speed, Measuring speed, Plotting Distance-time graph

Activities:
- To measure the speed and average speed of a moving object
- To determine time period of a pendulum

- To identify the factors affecting the time period of a simple pendulum
- To plot distance- time graphs
- Race amongst different houses

Revision and exams

SEPTEMBER

Water and Waste water story

Discussion of terms like potable and non potable water, need to conserve water, causes for decrease in water table and potable water ,pollution in water. Terms related to water pollution namely sullage water,foul waste, trade waste, agricultural waste , eutrophication will be introduced.

activities in lab

To test water for its:

1. Physical Properties like :Colour and odour

2. Chemical properties like:TDS,Chlorine content,estimation of hardness

and softness of water,Presence of other toxic contents (lead) Will be done in the

science lab.Samples for the above activity will be:

1. Sample A -student to test the water from their own bottle and Sample B Lab water sample.

This is followed by a Kahoot quiz /worksheetdone in class

OCTOBER

Language of chemistry (chemistry)
Concepts- Introduction to Atoms, Molecules, Elements, Compounds, Mixtures. Symbols of elements, Atomicity and Valency of elements, Chemical formula writing, naming a chemical compound, writing word equations.

Activities:
- Tennis ball/beads/ ball and stick model to demonstrate the concept of atom, molecule, element and compound.
- Youtube video on elements
- Lock and key game of chemical formula writing

NOVEMBER

Electric Current and its Effects (physics)
Concepts – Symbols of electric components – Circuit diagrams, Heating effect of electric current, Electric fuse, Magnetic effect of electric current, Electromagnet, Electric bell

Activities:
- To show how electric current flows
- Closed and open circuits

- Series and parallel circuits
- To show the heating effect of current
- To show the working of electric fuse and MCBs
- To understand the working of an electromagnet by a working model of an electric bell
- To make electromagnets using iron nails ,wires and batteries and study the factors affecting the strength of an electromagnet

DECEMBER

Acids, Bases and Salts (chemistry)

Concepts-classification of substances into acidic, basic and neutral; natural indicators-litmus, turmeric, china rose; Neutralization reaction, importance of neutralization reactions in everyday life

Activities:

- To test solutions of common substances for acidity and basicity
- Preparation of acids and bases
- Properties of acidic and basic substances
- To show neutralization reaction
- To use indicators to classify various readily available substances into acidic, basic and neutral
- Making indicators at home using china-rose and red cabbage
- To show the color changes of various indicators on acids and bases
- chemical properties of acids and bases
- uses of acids and bases in everyday life

JANUARY - FEBRUARY

Light (Physics)

Concepts – Rectilinear propagation of light, Reflection of light, Mirrors- Plane and spherical mirrors, Characteristics of images formed by Plane, Convex and Concave mirrors, Uses of these mirrors

Activities:

- To demonstrate rectilinear propagation of light
- To observe regular and diffused reflection
- Demonstration of lateral inversion using a plane mirror
- To demonstrate images formed by plane, convex and concave mirror
- To make a Newtons disc and understand how white light is made of seven colours
- To demonstrate the splitting of white light into seven colours using a prism

Light

Concepts – Lenses – Convex and concave, Characteristics of images formed by lenses, Uses of lenses, Colours – Newton's disc

Activities:

- To make a periscope and kaleidoscope
- To observe images formed by convex and concave lenses
- To make Newton's disc

REVISION

CHAPTER 4
HEAT

Learning outcomes:

- Students will be able to identify different types of thermometers.
- Students are able to measure temperature using a thermometer after finding its least count.
- Students will be able to convert the units of heat (calorie to Joule and vice versa)
- Students will be able to understand, identify, distinguish between the three modes of transfer of heat –conduction, convection and radiation.
- Students will be able to apply this knowledge to appreciate the practical applications of each of these modes of transfer of heat in our everyday lives.
- Students will be able to convert the given temperature into all three scales of measuring temperature – Celsius, Fahrenheit and Kelvin.
- Students will be able to find the least count of a scale.
- Students will be able to make accurate measurement of temperature using a clinical and laboratory thermometer.

Smart notes

Heat

- It is a form of energy.
- It is the energy that is transferred from one body to another as a result of temperature difference.
- The S.I. unit of heat energy is Joules (J).
- The CGS unit heat energy is calorie (cal).

Relationship between Joule and calorie:

1 calorie = 4.186 Joules =4.2 Joules (approx)

1cal = 4.2 J

Temperature

- It is the degree of hotness or coolness of the body.
- It is the thermal condition of the body which would determine the direction of flow of heat when this body is placed in contact with another body.
- The S.I. unit of temperature is Kelvin (K).
- The other units of temperature are _____.
- Temperature is measured by a device called _____.

There are two types of thermometer:

- Clinical thermometer
- Laboratory thermometer

Difference between clinical and laboratory thermometer-

Clinical thermometer	Laboratory thermometer
• The range is 35^0 C to 42 ^{0}C • It has a kink • It is used to measure temperature of the human body.	• the range is -10 ^{0} C to 110 ^{0}C • It does not have a kink • It is used to measure temperature of substances in laboratories

Conversion Formula:

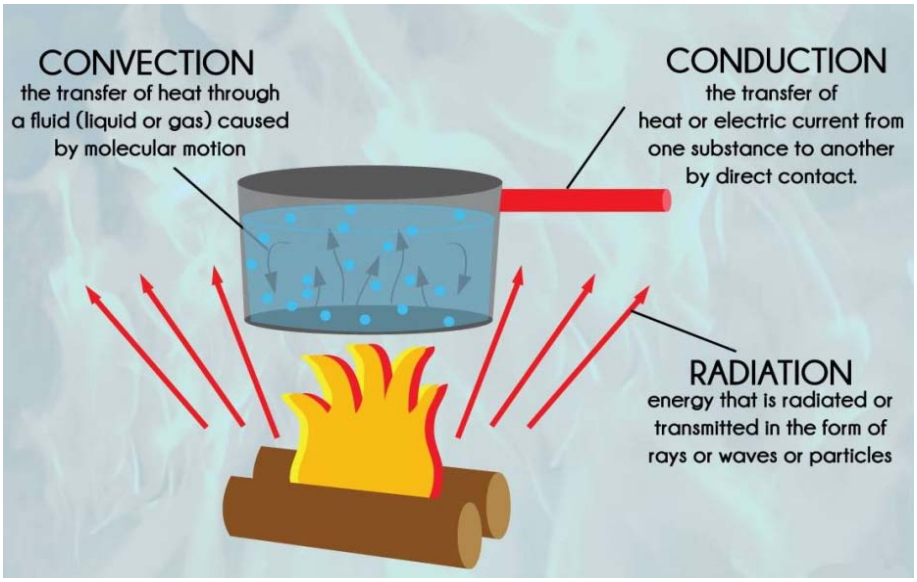
1cal = 4.186 or 4.2 J;

K = °C + 273;

$$^0F = \frac{9\,C}{5} + 32$$

$$^0C = \frac{5\,X\,(F - 32)}{9}$$

Modes of heat Transfer -



a. **Conduction** - It is the process of transfer of heat from the hotter part of a body to the colder part through passage of energy from particle to particle without actual movement of the particles.

   Conditions necessary for conduction to take place:

   - two objects should be in physical contact.
   - two objects should be at different temperatures.

Application:

- cooking utensils are provided with wooden handles but metallic bases
- in winters, metallic handles of wooden doors are colder
- a new quilt is warmer than an old one
- in winters, birds often swell their feathers
- eskimos make double walled houses of blocks of ice

b. **Convection** - It is the process of transfer of heat through a liquid or gas by the actual movement of the particles of the fluid. Portions in contact with the source of heat becomes hot, expands, becomes less dense and rise; their place is taken by colder portions, thus setting up convection current.

Application:

- exhaust fans are installed near the roof
- chimneys are installed over the gas burners in kitchen
- occurrence of **land and sea breeze**
- wind and ocean currents
- use of chimneys in factories

c. **Radiation** - It is the phenomenon of transfer of heat from the source to the receiver without any actual movement of the source or receiver. It does not need a medium to transfer heat.

⇒ Every object whose temperature is above zero Kelvin, emits radiations (heat). The heat radiations emitted depend upon -

- ❖ temperature of the body
- ❖ nature of the radiating surface

⇒A hot object radiates heat. When it falls on other objects, a part is reflected, a part is absorbed and a part is transmitted. The temperature of an object depends upon the absorbed part of heat.

⇒ Good absorbers of heat are also good radiators.

⇒ Black surfaces are better absorbers of heat and hence better radiators of heat than white and polished surfaces.

Application:

- In summers, light coloured clothes are preferred.
- cooking utensils are blackened at the bottom and polished at the upper surface.
- hot water pipes and radiators used in rooms are painted black.
- shiny, polished reflectors are used in electric heaters.
- construction of a thermos flask.
- fire fighters wear shiny suits and helmets.

CHAPTER 4

HEAT

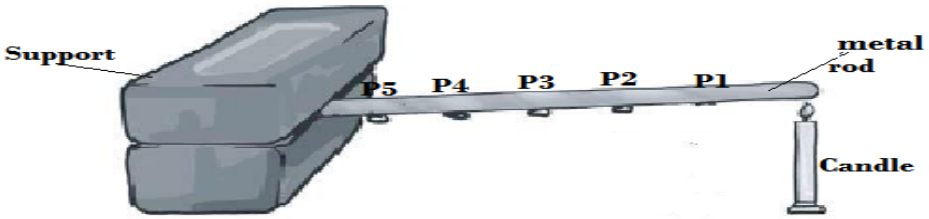
Activity 2

Aim – To show how conduction takes place in a metal.

Materials Required –Stand, metallic ruler, wax, pins, source of heat.

Theory - It is the process of transfer of heat from the heated part of a body to the colder part through passage of energy from particle to particle without actual movement of the particles.

Diagram



P1, P2, P3, P4, P5 are drawing pins /paper clips

Procedure

- Take a metal strip.
- Glue some metal board pins on to the rod at equal distances using wax.
- Fix one end of the rod on a stand.
- With the help of a lamp start heating the strip from one end and observe.

Observation

_____

_____

Conclusion

_____

_____

_____

CHAPTER 4

HEAT

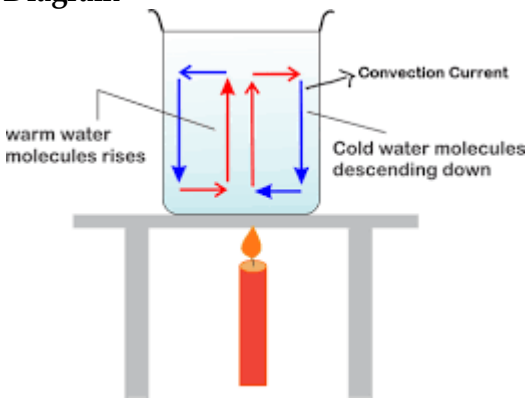
Activity 3

Aim – To show convection currents.

Materials Required –beaker, water, potassium permanganate, source of heat.

Theory - Convection is the process of transfer of heat through a liquid or gas by the actual movement of the particles of the fluid.

Diagram



Procedure

- Fill the beaker to the halfway with clear water.
- Heat the water.
- Take a pinch of potassium permanganate crystals and drop it gently to the bottom of the beaker and observe.

Observation:

_____
_____
_____
_____

Conclusion

_____
_____
_____

CHAPTER 4

HEAT

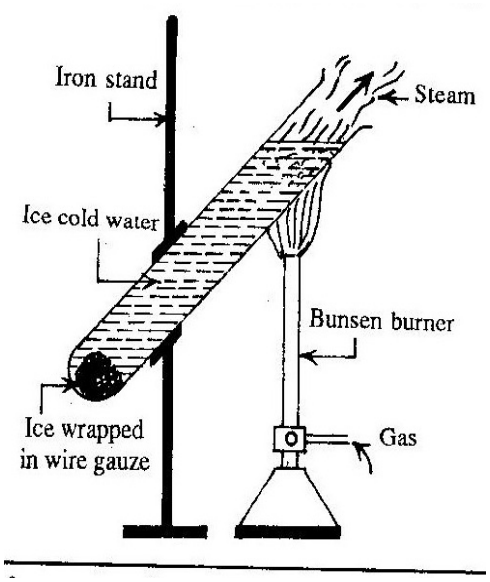
Activity 4

Aim – To show that both glass and water is a poor conductor of heat.

Materials Required – Hard glass test tube, water, wax, source of heat, test tube holder.

Theory – Conduction is the process of transfer of heat from the heated part of a body to the colder part through passage of energy from particle to particle without actual movement of the particles.

Diagram



Procedure

- Half fill a test tube with cold water.
- Wrap a piece of ice in wire gauze and drop it in the tube. It will sink to the bottom.
- Now heat the top end of the test tube for 5- 7 minutes.
- Now touch the bottom of the test tube. Jot down your observations.

Observations:_____

_____

_____

_____

Conclusion:

_____

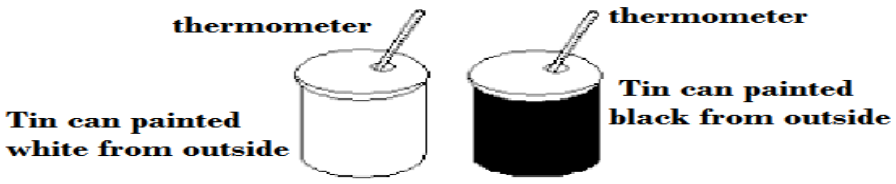
_____

CHAPTER 4
HEAT

Activity 5

Aim – To show that black coloured objects are better absorbers of heat than white coloured objects.
Materials Required - two identical tin cans, black and white paint, two clinical thermometers.

Theory - Black bodies are better absorbers of heat than white bodies.
Diagram



Procedure

- Take two identical tin cans.
- Paint one of them white and other black from outside.
- Pour equal volume of water in each can.
- Insert a laboratory thermometer in each of the cans and place them in sun for one hour.
- Note the temperature of the two thermometers after an hour.

Observation

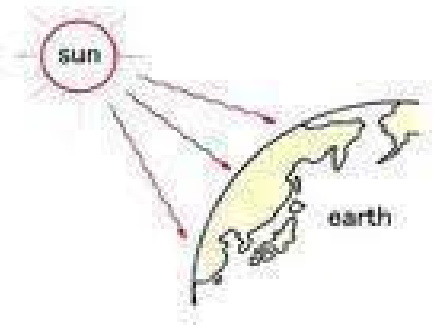
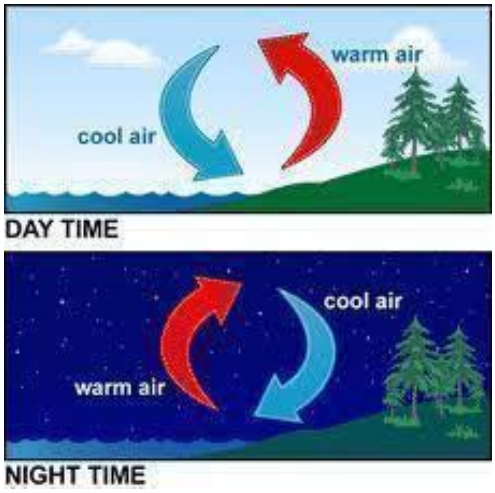
The temperature of the water in the black can = _____
The temperature of the water in the white can = _____

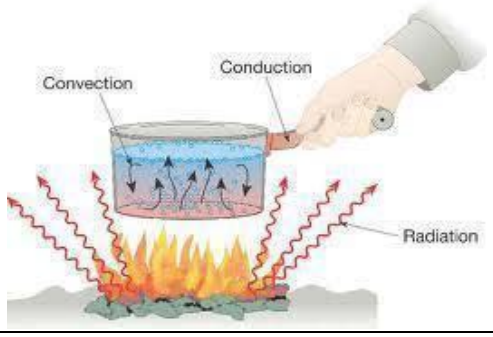
Conclusion

_____
_____

Assignment 4.1

1. Look at the following pictures and write the primary mode of transfer of heat in each case:-

	(a) From the sun to earth _____
	(b) From the flame to the vessel _____
	(c) Movement of air - _____
	(d) From the flame to the metal rod _____

	(e) uniform heating of water-- _____ From the vessel to its handle - _____ From the fire to the sides - _____

2. In which direction does heat flow occur when you hold an ice cube in your hand?

_____

_____

3. At what temperature are the readings on the Celsius and Fahrenheit scales the same? Prove with calculations?

_____

_____

_____

CHAPTER 4

HEAT

Assignment 4.2

Multiple Choice Questions
Tick the correct option(s):-

1. Heat is a form of -

a) electricity
b) energy
c) friction
d) force

2. The primary mode of transfer of heat in solids is

a) conduction
b) convection
c) radiation
d) conduction and convection

3. Which of these is a good conductor of heat?

a) wool
b) straw
c) water
d) copper

4. The heat energy from the sun reaches us through

a) conduction
b) convection
c) radiation
d) radiation as well as convection

5. Air conditioners are placed high up on the walls so that

a) they create less noise
b) cooler air sinks down and cools the room as hot air rises up
c) room looks better
d) cooling takes place faster by conduction

6. It is easier to drink tea from a porcelain mug than from a steel glass as

a) porcelain mug has a handle
b) tea cools faster in steel glass
c) porcelain is an insulator and so when lips come in contact with the mug it is not too hot
d) porcelain mugs are attractive

7. The mode of transfer of heat in which molecules do not change their positions is

a) conduction
b) convection
c) radiation
d) both conduction and convection

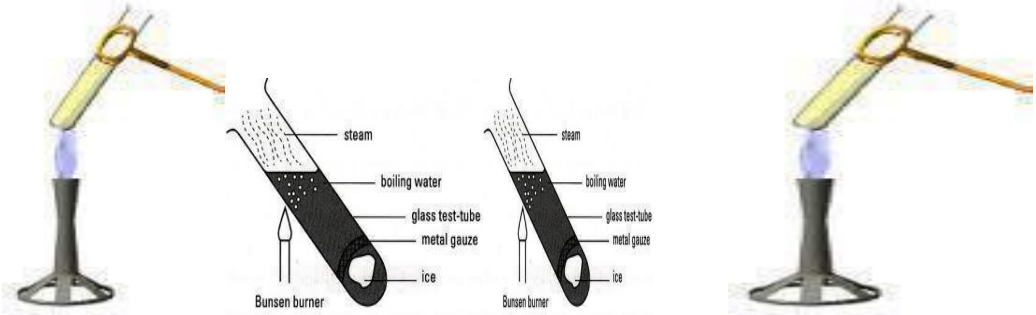
7. Sea breeze is caused due to

a) conduction
b) convection
c) radiation
d) neither conduction nor radiation

8. Of the pair of substances given, which pair has only conductors?

a) wood and iron (b) iron and glass
c) iron and copper (d) copper and glass

9. In which case will the entire water in the test tube heat up? Why?



A B C D

a) A, due to conduction
b) B, due to convection
c) C, due to conduction
d) D, due to convection

10. Which of the following can be used to measure our body temperature?

a) any mercury thermometer
b) alcohol thermometer
c) clinical thermometer
d) laboratory thermometer

CHAPTER 4

HEAT

Open Book Test

Fill in the blanks with appropriate word(s):-

i. A reliable measure of the hotness of an object is its _____.

ii. Temperature is measured by a device called _____.

iii. The thermometer that measures our body temperature is called _____ thermometer.

iv. The normal temperature of a human body is _____ ^{o}C.

v. The range of laboratory thermometer is _____ ^{o}C to _____ ^{o}C.

vi. The _____ of a clinical thermometer prevents mercury level from falling on its own.

vii. In _____, generally heat is transferred by conduction.

viii. _____ and _____ are two substances which are not solids and are poor conductors of heat.

ix. _____ conductors are also called insulators.

x. If two conducting objects at different temperatures are in contact, heat flows from _____ object to _____ object.

xi. Sea breeze occurs during _____ and land breeze occurs during _____.

xii. Our body gives heat to and receives heat from the surroundings by _____.

xiii. Wool is a _____ conductor of heat.

xiv. The temperature of the object _____ due to the absorbed part of the heat.

xv. Light coloured clothes _____ most of the heat that falls on them.

CHAPTER 4.

HEAT

Numericals for Practice (to be done in the notebook)

Conversion formula between Joule (J) and calorie (cal)

1cal = 4.18 J = 4.2 J

Conversion formula between ^oC, ^oF and K

$$K = {}^oC + 273$$

$$C = \frac{5 \times (F - 32)}{9}$$

$$F = \frac{9\,C}{5} + 32$$

Practice questions-

Convert :-

1. 27^oC into K
2. 100 ^oC into K
3. 323K into ^oC
4. 290 K into ^oC
5. 23 K into ^oC
6. 20 ^oC into ^oF
7. 68 ^oF into ^oC
8. 100 ^oC into ^oF
9. 227 ^oC into ^oF
10. -40 ^oF into ^oC

Convert :-

1. 3 cal into J
2. 8.4 J into cal
3. 5 cal into J
4. 21 J into cal
5. 7 cal into J
6. 16.8 J into cal
7. 2 cal into J
8. 12.6 J into cal
9. 10 cal into J
10. 42 J into cal

CHAPTER 4

HEAT

Assignment 4.5
(to be done in the notebook)

Think and answer (for Revision)

Explain the following observations scientifically:-

i. Huge ice blocks are covered with sawdust and packed in jute sacks during transfer.

ii. During winters, the metallic handles of wooden doors are colder than the doors.

iii. Deserts are cooler during nights.

iv. A bird fluffs its feather on a cold day.

v. A black car gets hotter in the sun than a white car.

vi. A double layered blanket is warmer than a single thick blanket.

vii. The heating element of an electric kettle is at the bottom.

viii. Ventilators are provided near the roof of rooms in our houses.

ix. We feel warm if we wear woollen clothes in winter.

x. Fire fighters wear special shiny suits when they enter a building on fire.

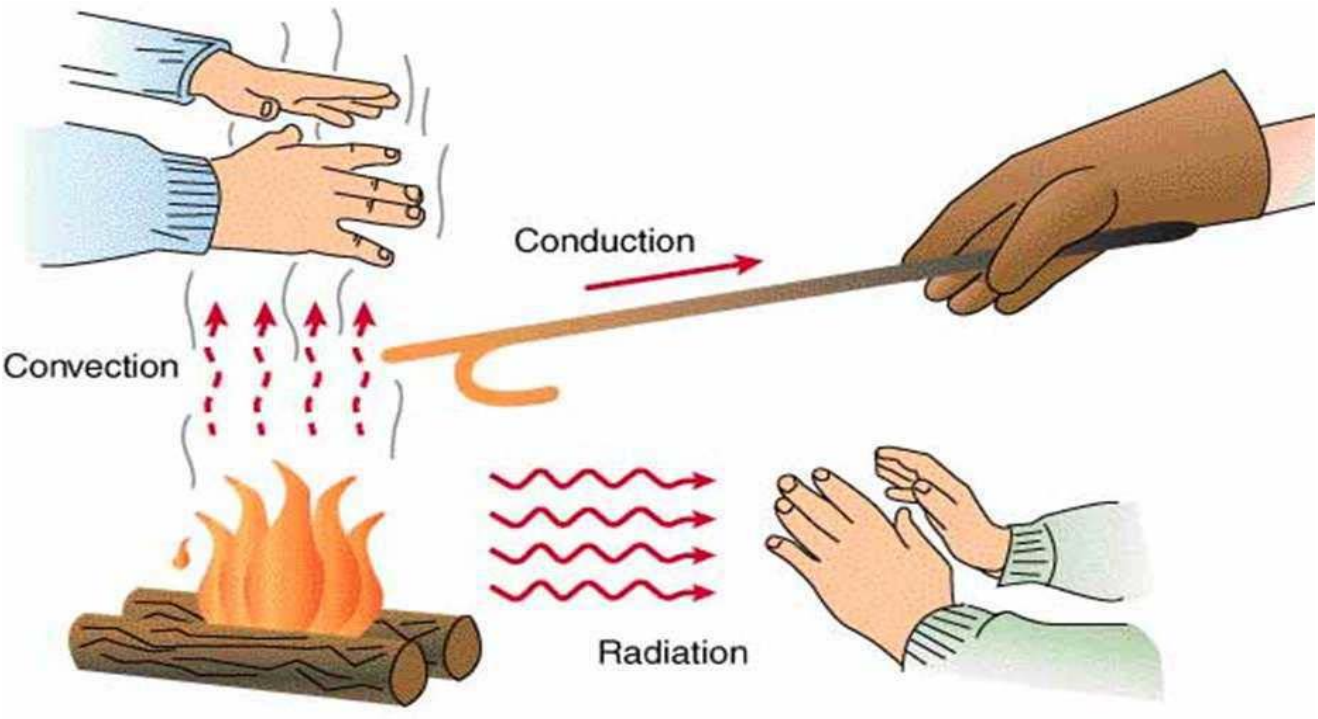
xi. A loosely knit sweater keeps us warmer than a tightly knit one.

xii. The bottom of cooking utensils are blackened and the upper part is kept shining.

Types of Thermometers

Distinguish between Conduction , Convection and Radiation.

Conduction	Convection	Radiation



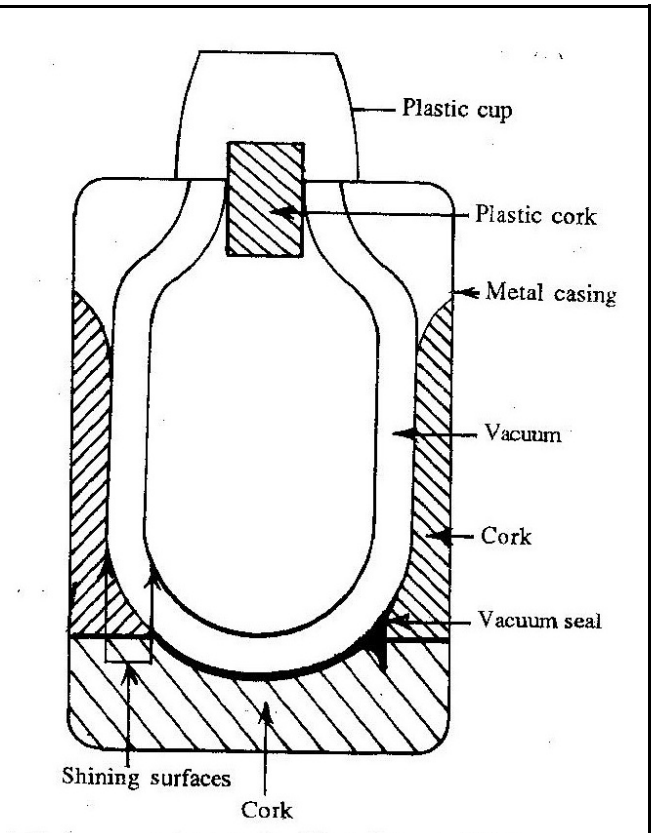
Answer the following questions:- (to be done in the notebook)

1. What are the precautions which need to be taken while using a laboratory thermometer?
2. Why is the range of clinical thermometer 35°C to 42°C?
3. Write an activity to show that conduction takes place in a metal. [In activity format]
4. Explain how convection takes place in water?
5. Explain land and sea breeze with relevant diagrams.

Principle of a Thermos Flask

A thermos flask or a vacuum flask is used to keep a hot liquid hot and a cold liquid cold for a long time, by preventing heat loss or gain of heat by conduction, convection and radiation.
The thermos flask consists of a double-walled glass vessel resting on a cork inside a metal or plastic case. The outer surface of its inner wall and the inner surface of its outer wall are silvered. This prevents heat transfer due to radiation. The space between the two walls is almost vacuum and the walls are sealed at the top. The double-walled glass vessel and vacuum prevents heat loss by conduction. The insulating stopper or cork at the top minimises heat loss by convection.

Vacuum flasks are used at home, and in laboratories and industries to store liquids that become gases at low temperatures.



CHAPTER 4

HEAT

High Order Thinking Skills

1. What are the various measures used by a pizza delivery man to keep pizza hot?

2. You have to keep ice cold water in a plastic bottle from morning to noon. What arrangements will you make to succeed in keeping the water cold?

3. Houses in different regions vary according to the climatic conditions of the places. Suggest ways of constructing a house so that it caters to the requirement of a desert [clue – rooms should be cool] polar region [clue – rooms should be warm]

4. Draw a labelled diagram of a thermos flask and explain how it keeps water hot for long time.

5. Water at depth in lakes stays cold even on hot summer days. How?

6. If pieces of black paper and white paper are laid on snow in sunshine, what is likely to happen?

7. Why a clinical thermometer should not be sterilized by boiling?

8. Give an example of a solid which contracts on heating.

ANSWER THE FOLLOWING IN YOUR NOTEBOOKS-

1. Distinguish between--

a. Heat and Temperature
b. clinical and a laboratory thermometer.

2. Define Least count? Write the formula?

3. Calculate the least count of thermometers that have 10 equal spacings between-

a. 20 degree Celsius and 30 degree Celsius.
b. 20 degrees Fahrenheit and 40 degree Fahrenheit.
c. 0 Kelvin and -10 Kelvin.
d. 0 degree Celsius and 5 degree Celsius.

4. Mention the precautions to be observed to record accurate temperatures , while using the following-

- **Clinical thermometer**
- **Laboratory thermometer**

CHAPTER 5

Acids, bases and salts

Learning Outcomes:

- The students will be able to differentiate between acids, bases and salts.
- The students will be able to identify various natural and synthetic indicators and their colour changes with acids and bases.
- The students will be able to differentiate between an alkali and a base.
- The students will be able to conduct investigation to find the nature of various food items using indicators.
- The students will be able to design and write the chemical word equations of the formation of acids, bases and salts.
- The students will be able to classify the food items as acidic or basic and apply it design diet charts.
- The students will be able to conduct experiment to conduct neutralization reaction and appreciate its importance in daily life.

CHAPTER 5

Acids, bases and salts

Smart Notes

Substances may be classified as-

- Acid
- Bases
- Salts

Acids-

- Taste sour
- Contain replaceable hydrogen radical(H +)
- May be organic or mineral
- Turn blue litmus red
- Some commonly found acids are- Hydrochloric acid, nitric acid, sulphuric acid, acetic acid, lactic acid, citric acid etc

Mineral and organic acids-

- Mineral acids are found in nature in rocks.
- Are strong and corrosive

Common mineral acids- Hydrochloric acid, nitric acid, sulphuric acid

* Acids must NOT be tasted to identify.

Organic acids-

- Are found in plants and animals
- Are weak acids.

Common organic acids are Acetic acid(vinegar), Lactic acid(in milk and curd, formic acid(in ant sting), citric acid(in citrus fruits like lemon and orange), oxalic acid(in spinach), ascorbic acid(in citrus fruits and amla), tartaric acid(in tamarind, grapes, unripe mangoes etc.)

Bases-

- Are bitter to taste
- Are soapy to touch
- Contain replaceable hydroxide radical(OH -)
- Turn red litmus blue
- Turn phenolphthalein pink

Common bases are sodium and potassium hydroxide (used in making soap), magnesium hydroxide(milk of magnesia), ammonium hydroxide(used as window cleaner), calcium hydroxide(lime water)

Indicators-

Acids and bases must not be tasted to be tested. Indicators are chemical substances which change colour in presence of acidic or basic medium and are used to identify whether a substance is acidic, basic or neutral. Some common indicators are litmus (obtained from lichens plant), phenolphthalein, methyl orange, turmeric, China rose etc.

Formation of an acid-

A non metal is made to react with oxygen. This forms a non metallic oxide. The oxide when dissolved in water forms an acid.

Non metal + oxygen --->Non metallic oxide

Non metal oxide + water --→ Acid

eg :-

$C + O_2$ ------> CO_2

$CO_2 + H_2O$ -------> H_2CO_3

Formation of a base-

A metal reacts with oxygen to form a metallic oxide. This metallic oxide when dissolved in water forms a metallic hydroxide or a base

Metal + Oxygen --→ Metal oxide (basic)

Metal oxide + water --→ Metallic hydroxide / base

eg $Mg + O_2$ -------> MgO

$MgO + H_2O$ -------> $Mg(OH)_2$

Bases which dissolve in water are called alkali.

ll alkalies are bases but all bases may not be alkali (as they may not dissolve in water)

Neutralisation- An acid reacts with a base to form salt and water. This reaction is called neutralization reaction. Heat is released during a neutralization reaction.

Acid + Base --→ Salt + Water

Neutral substance-

- Is called a salt
- Does not show a colour change with indicators.

Uses of neutralization-

- Curing acidity in the stomach
- Neutralizing acidity or basicity of soil
- Curing ant sting
- Cleaning surfaces soiled with acids etc.

ACID / ALKALINE FOOD COMPARISON CHART

EAT LESS ⊖ — MORE ACIDIC ◁◁◁◁ — NEUTRAL — MORE ALKALINE ▷▷▷▷ — EAT MORE ⊕

⊖⊖⊖⊖	⊖⊖⊖	⊖⊖	⊖		⊕	⊕⊕	⊕⊕⊕
Soft Drinks Energy Drink Carbonated Drinks ***Processed & Refined Food**	Popcorn Cream Cheese Buttermilk Pastries Pasta Cheese Pork Beef Beer, Wine Black Tea Pickles Roasted Nuts Vinegar Sweet & Low Equal, Nutra Sweet	Most Purified Water Distilled Water Coffee Chocolate Sweetened Fruit Juice Pistachios White Bread Peanuts Nuts	Fruit Juices Most Grains Eggs Fish Tea Soy Milk Coconut Lima Beans Plums Brown Rice Cocoa Oats Oysters Salmon	Most Tap Water Most Spring Water River Water	Apples Almonds Tomatoes Grapefruit Corn Mushrooms Turnip Olives Peaches Bell Pepper Radish Pineapple Cherries Wild Rice Apricot Strawberries Bananas	Avocados Green Tea Lettuce Celery Peas Sweet Potatoes Egg Plant Green Beans Beets Blueberries Pears Grapes Kiwi Melons Tangerines Figs Dates Mangoes Papayas	pHresh greens® Spinach Broccoli Artichoke Brussel Sprouts Cabbage Cauliflower Carrots Cucumbers Lemons Limes Seaweed Asparagus Kale Radish Collard Greens Onion ***Raw / Uncooked**

Acids, bases and salts
Assignment 5.1

Q1. Classify the following as acidic, basic or neutral-
Lime juice, baking soda, soap solution, lime water, water, fizzy drink, common salt

Acidic	Basic	neutral

Q2. Fill in the blanks-

a) _____ acid is found in tamarind.

b) CH_3COOH is commonly known as _____.

c) Most mineral acids are _____ acids.

d) _____ acid is also called the king of chemicals.

e) Water soluble bases are called _____.

f) Calamine lotion contains _____.

g) A metal oxide dissolves in water to form a _____.

h) _____ is also called milk of magnesia.

Q3. Correct and rewrite the following statements-

a) All bases are alkali.

_____

b) Tomato is neutral in nature.

_____

c) Acids obtained from unripe mangoes and grapes are mineral acids.

_____

d) A mineral acid can be diluted by adding sufficient amount of water to it.

_____

e) Lemon juice is best stored in metal jars.

_____

Q4. Complete the following table-

Indicator	Colour in acid	Colour in base
Blue Litmus	_____	Blue
Red litmus	_____	_____
Phenolphthalein	_____	Pink
_____	Pink	Yellow
_____	Dark pink	Green
Turmeric	_____	Red

Q5. Write the chemical names of the following substances-

a) Vinegar- _____

b) Baking soda- _____

c) Washing soda- _____

d) Quick lime- _____

e) Milk of magnesia- _____

f) Slaked lime- _____

Acids, bases and salts
Assignment 5.2 (To be done in the notebook)

Q1. Differentiate between an organic and a mineral acid.

Q2. Write an activity to show that-

a. metallic oxides are basic in nature
b.Non metal oxides are acidic in nature.
c.Water is a neutral substance

Q3. Give reasons for the following-

a) A turmeric stain on your shirt turns reddish brown when soap is applied on it.
b) Common salt is added to pickles.
c) Working tables and shelves in your chemistry laboratory are covered with tiles and not wood or metals.
d) Acids taste sour. However, they must not be tasted in order to be identified.
e) Factory waste must be treated before discarding.

H.O.T.S.

Q1. It is a common practice to rub onion peel or a metal key on a bee sting. How does it help?

Q2. Hydrochloric acid is a strong, corrosive mineral acid. Why then is it present in your body?

Q3. Why is common salt added to ice creams?

Q.4 Shantanu was bit by a wasp. His mother quickly got vinegar and dipped the infected area in it. why did she do this?

Miscellaneous Exercise

Acids, bases and salts

Q1. Classify the following as mineral or organic acid–
Sulphuric acid, phosphoric acid, acetic acid.

Mineral-_____

Organic- _____

Q2. Solutions of two substances **A** and **B** were tested with litmus paper. Solution of **A** turned red in litmus while that of **B** turned blue.Classify **A** and **B** as metal and non-metal.
A - _____ **B -** _____

Q3. Give one word for the following-

a) Substances which change color in acidic and basic medium-_____.

b) The gas released when a metal combines with dilute acids-_____.

c) Substances which remain unaffected by indicators-_____.

d) Acid which helps in digestion- _____.

e) Acid present in vinegar -_____.

f) Acid which makes soft drinks fizzy- _____.

g) Common name of sodium chloride-_____.

h) Other name for soluble bases-_____.

i) Chemical name of baking soda-_____.

Chapter – Acids, Bases & Salts

Activity No. 01

Aim: To test which out of the two given solutions is an acid or a base with the help of indicators.

Material Required:

Chemicals Required:

Theory:

_____

_____

Procedure:

_____

_____

_____

_____

_____

Diagram:

Observations:

Indicator Type	Acid (dilHCl)	Base (NaOH)
Blue Litmus Solution/paper		
Red Litmus Solution/ paper		
Methyl Orange		
Phenolphthalein		

Results:

_____

_____

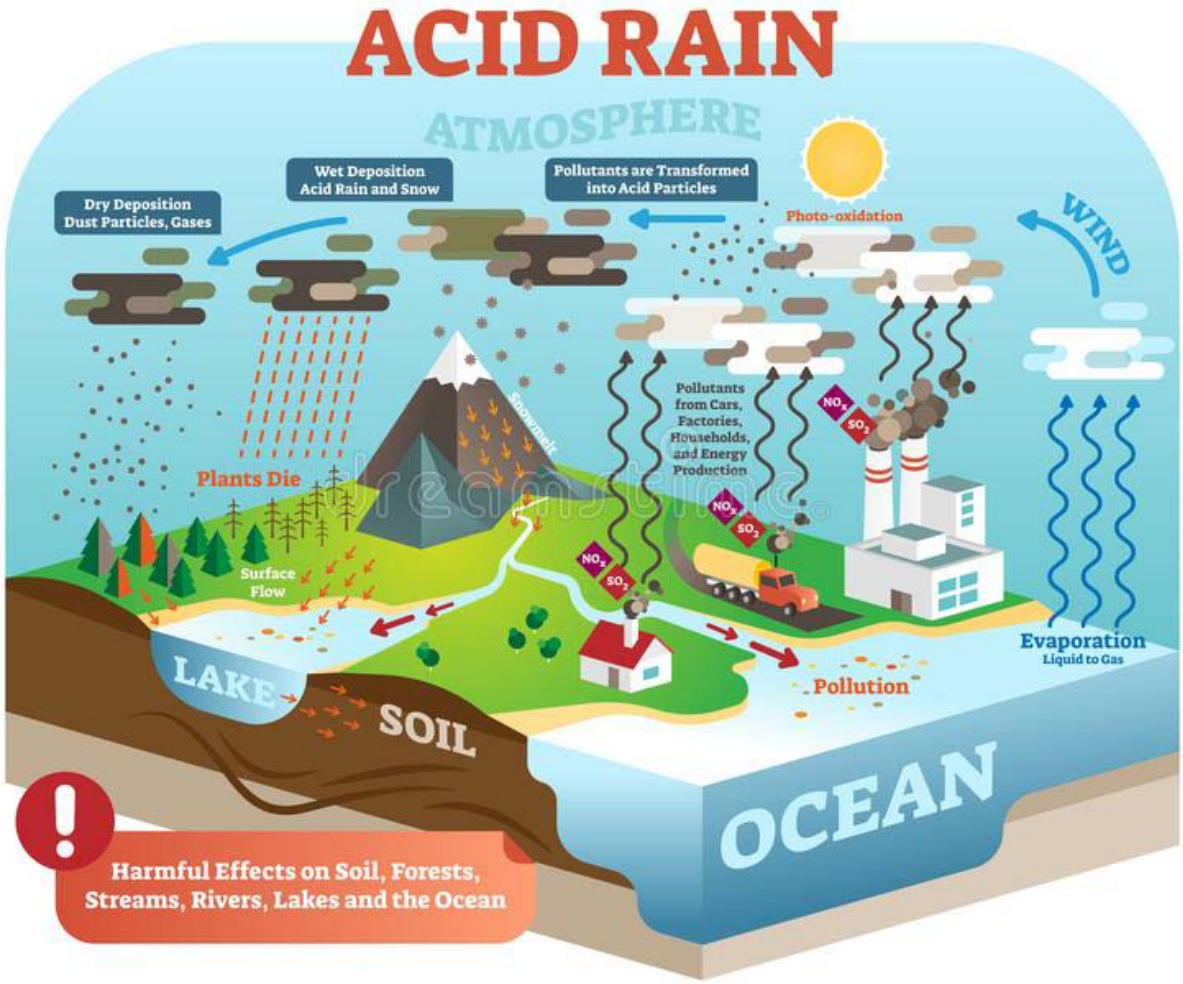
Precautions:

As both acids and bases can cause damage to skin and they are corrosive, a lot of care should be exercised while putting them in the test tubes.

Rinse the test tubes properly with water before using them.

At no point of time, in the laboratory, should the acids and bases be mixed as they can cause a lot of heat production and accidents

Acid rain causes and effects



Did you know????

Acid rain is rain consisting of water droplets that are unusually acidic because of atmospheric pollution - most notably the excessive amounts of sulfur and nitrogen released by cars and industrial processes. Acid deposition can occur via natural sources like volcanoes but it is mainly caused by the release of sulfur dioxide and nitrogen oxide during fossil fuel combustion. When these gases are discharged into the atmosphere they react with the water, oxygen, and other gases already present there to form sulfuric acid, ammonium nitrate, and nitric acid. These acids then disperse over large areas because of wind patterns and fall back to the ground as acid rain or other forms of precipitation.

Acid rain causes acidification of lakes and streams and contributes to the damage of trees at high elevations (for example, red spruce trees above 2,000 feet) and many sensitive forest soils. In addition, acid rain accelerates the decay of building materials and paints, including buildings, monuments, statues, and sculptures that are part of our nation's cultural heritage.

When the freshwater becomes highly alkaline, the effects on fish may include: death, damage to outer surfaces like gills, eyes, and skin and an inability to dispose of metabolic wastes. High level of alkalies may also increase the toxicity of other substances. For example, the toxicity of ammonia is ten times more severe when the amount of bases is more. It is directly toxic to aquatic life when it appears in alkaline conditions.

Now based on your understanding, answer the following questions:

(a) Some acids and alkalis are **corrosive**. What does **corrosive** mean?

_____

_____

(b) Write the word equation to show the chemical reaction taking place during acid rain

_____

(c) This symbol is used as a warning sign for corrosive acids and alkalis.

 Where might you see this **safety symbol**?

_____

(d) What does the symbol mean? _____

(e) When we use acids and alkalis, what must we always wear? Why ?

_____

(f) How is highly alkaline nature corrosive?

_____

Higher order thinking skills ::-

1. When an acid combines with a base , what does the reaction result in?
2. What ion found in a solution would make it acidic?
3. What scale is used to determine whether a solution is acidic or basic?
4. A pH of less than 7 indicates the solution is a/an _____.
5. A pH greater than 7 would indicate the solution was a/an _____.
6. A neutral Solution has a pH of _____.

CHAPTER 6

PHYSICAL AND CHEMICAL CHANGES

Learning Outcomes

- The students will be able to differentiate between physical and chemical changes.
- The students will be able classify the changes around us as physical and chemical changes.
- The students will be able to describe the effects of changes and their causes.
- The students will be able to apply these scientific concepts in daily life to understand the properties of material formed by various changes.
- The students will be able to design and write the chemical (word) equation of the chemical changes that they see on daily life.

Smart Notes

1. Difference between physical and chemical changes

Physical change	Chemical change
1. It is a change in which a substance undergoes a change in its physical properties such as size, shape, state etc	1. It is a change in which a substance undergoes a change in which one or more new substances are formed called products.
2. No new substance is formed	2. New substance with new properties is formed.
3. Energy is neither absorbed nor evolved.	3. Energy in the form of heat, light, etc are absorbed or evolved.
4. The chemical composition and properties of substances remain same.	4. The chemical composition and properties of the new substances are different from the original substances.
5. Example- tearing a paper	5. Example- Burning of paper

2. The properties such as _____, _____, _____ and _____ of a substance are called its **physical properties**.

3. During a chemical change / reaction, when new products are formed, it is usually accompanied by

(a) Release or absorption of energy in the form of heat, light, etc

(b) Production of sound

(c) Change in smell

(d) Change in colour

(e) Formation of gas

4. Classify the following changes into physical and chemical changes:-

	Change	Physical/Chemical
	Tearing of paper	
	Burning of paper	
	Melting of wax	
	Burning of wax	
	Formation of curd from milk	
	Melting of ice	
	Boiling of water	
	Heating of an iron nail	
	Rusting of iron	
	Burning of magnesium ribbon	
	Photosynthesis	
	Dissolving salt in water	
	Burning of coal	
	Crushing of a chalk	
	Digestion of food	
	Cutting a log of wood	
	Keeping iron filling in $CuSO_4$ solution	
	Formation of manure from leaves	
	Stretching of a rubber band	
	Bursting of cracker	
	Crystallisation of $CuSO_4$ solution	

	Adding a pinch of baking soda to vinegar	
	Passing carbon dioxide through lime water	
	Souring of milk	
	Beating aluminium to make aluminium foil	

Rusting- Rusting is the process in which iron reacts with oxygen and moisture in the air to form a reddish brown coating on its surface of a substance called rust. Presence of common salt speeds up rusting. If either oxygen or moisture is absent, rusting does not occur.
IRON + OXYGEN +WATER/MOISTURE --------> HYDRATED OXIDE OF IRON/RUST

Conditions required for rusting to take place:-

a.Presence of _____

b.Presence of _____

Rusting is faster when content of _____ is high in air.

Rusting can be prevented by

Applying a coat of paint or _____

Depositing a layer of a metal like _____ or _____ on iron.

Why do ships suffer a lot of damage from rusting?

In spite of ships being painted, they suffer a lot of damage because a part of the ship is always in water and water droplets cling on the part which is above water.
Ships sail in sea and sea water contain salts. Salt make rusting faster.

Galvanisation – It is the process of depositing a layer of molten zinc on iron.

Practice exercise

Physical and chemical changes

Q.1. Fill in the blanks:-

a) _____reactions are accompanied by other absorption or evolution of energy.
b) Matter can be classified as _____, _____and _____.
c) New substances are formed in a _____reaction.
d) A change in physical state of a substance is called _____change.

2. Are all physical changes reversible? Give an example to support your answer.

3. Define the following terms:-
a. Crystallisation b. Galvanisation c. Rusting

4. Complete the following table giving reasons, whether the classification in column B is correct or not:-

A	B	C
Sublimation of iodine	Physical Change	
Mixing of salt and water	Chemical Change	
Burning a piece of paper	Physical Change	
Formation of compound	Chemical Change	
Heating of iron fillings & Sulphur powder	Physical Change	
Respiration	Physical Change	
Passing of CO_2 gas in lime water	Chemical Change	
Formation of Biogas	Physical Change	

Q.5. Write word equations for the following chemical changes-

a) The oxide of magnesium is dissolved in water to form magnesium hydroxide
b) Baking soda is added to an aerated drink to form bubbles of carbon dioxide and other substances
c) Carbon dioxide is exhaled in lime water to form carbonic acid.
d) Zinc granules are added to hydrochloric acid to form zinc chloride and liberate hydrogen gas.
e) Iron reacts with oxygen and moisture to form rust
f) Magnesium reacts with oxygen to form Magnesium oxide

Q7. Food items like apples if cut and exposed to air, become brownish. Explain Why?

H.O.T.S.

Q1. When you buy a new water bottle, you find a little pouch of silica gel inside. Why is it kept in a water bottle? Can you use it at other places also?

Q2. A change may be both physical and chemical. Do you agree? Justify.

Q3. Conversion of organic matter into biogas is a chemical change . why?

CHAPTER 13

MOTION AND TIME

Learning Outcomes:

- The students will be able to understand that motion is relative.
- The students will be able to identify the type of motion of different objects around us.
- The students will be able to understand the to and fro motion of a simple pendulum.
- The students will be able to calculate the Time period of a simple pendulum.
- The students will be able to measure distances and time.
- The students will be able to compare the motion of bodies and classify them as fast or slow.
- The students will be able to calculate the speed and average speed of moving bodies.
- The students will be able to identify uniform and non-uniform motion.
- The students will be able to plot the distance Vs time graph of a moving body using a given data , interpret its motion.
- The students will be able to calculate the sped of a moving body usig the distancetime graph for a body moving with uniform motion.

Smart notes

1. Motion – An object is said to be in motion if its _____ changes with _____ with respect to a stationary object.

2. Distance - It is the total length of the path covered by a body. SI unit is meter.

3. Fast / Slow – An object is said to be fast if it covers a certain distance in _____ time.

An object is said to be slow if it covers the same distance in _____ time.

4. Uniform motion – An object moving along a _____ line with uniform speed and covers equal distances in equal intervals of time,is said to be in uniform motion. eg. A car moving on a staright road with a speed of 10km/h.

5. Non-uniform motion – If an object changes either the _____ or _____of its motion or both speed and direction, then it shows non uniform motion.

6. Speed – It is the _____ travelled per unit time by a moving object. Si unit is meter/second.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

;

$$\text{Average speed} = \frac{\text{total distance}}{\text{total time}}$$

7. The SI unit of distance is **metre (m).**

8. The SI unit of time is **second (s).**

9. The SI unit of speed and average speed - **metre per second (m/s).**

10. Another unit often used is kilometer per hour (**km/h**).

11. Speedometer – It records the_____ of a vehicle in km/h at every instant of time when the vehicle is moving.

12. Odometer – It measures the _____ travelled by a vehicle.

13.**Uniform Speed:** A body is said to be moving with uniform speed if it covers equal distances in equal intervals of time.

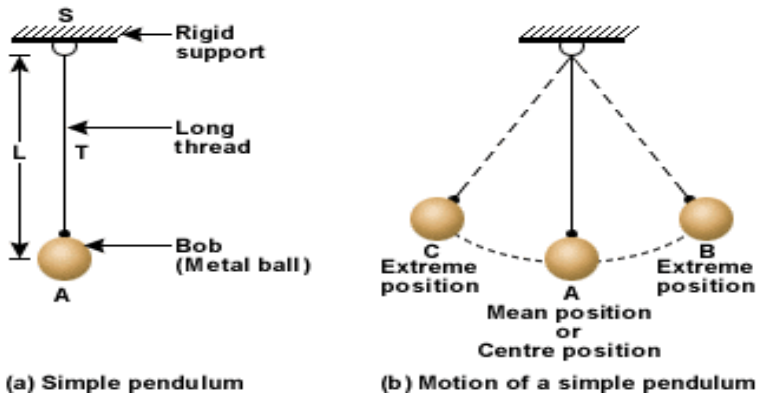
Activity 1

Aim: To find the time period of a simple pendulum by changing the length of the string.

Materials required: a metal bob, a cotton thread, a rigid support, a stop watch, a ruler.

Theory: The time taken by the pendulum to complete one oscillation is called its Timeperiod.
Si unit of time period is second.
More the length of the pendulum, more is its timeperiod.

Diagram :



Procedure :

- Take a metal bob and tie it with a cotton thread.
- Hang it with a rigid support.
- Measure and note the length of the pendulum.
- Now note the time taken for 20oscillations
- Now repeat the same with two other different lengths of the pendulum.

Observation table:

S.No	Length of string (cm)	Time taken in seconds to complete 20 oscillations.	T Time period= Total time/Number of oscillations (s)

Conclusion:

_____

_____

CHAPTER 13

MOTION AND TIME

Assignment 13.2

Multiple Choice Questions

Tick the correct option(s):-

1) Which of these are units of time?
   a) second
   b) hour
   c) light year
   d) year

2) The time period of a simple pendulum depends upon
   a) length of pendulum
   b) mass of bob
   c) amplitude of oscillating pendulum
   d) length of string

3) The distance covered by an object can be calculated by the formula
   a) speed / time
   b) time / speed
   c) speed x time
   d) speed + time

4) The instantaneous speed of a vehicle is measured with-
   a) odometer
   b) ammeter
   c) anemometer
   d) speedometer

5) The **distance- time graph of a stationary object** is a
   a) curved line
   b) straight line parallel to time axis
   c) straight line parallel to distance axis
   d) straight line inclined towards time axis

6) Which of the following is not a time measuring device?
   a) sun dial
   b) water clock
   c) odometer
   d) sand clock

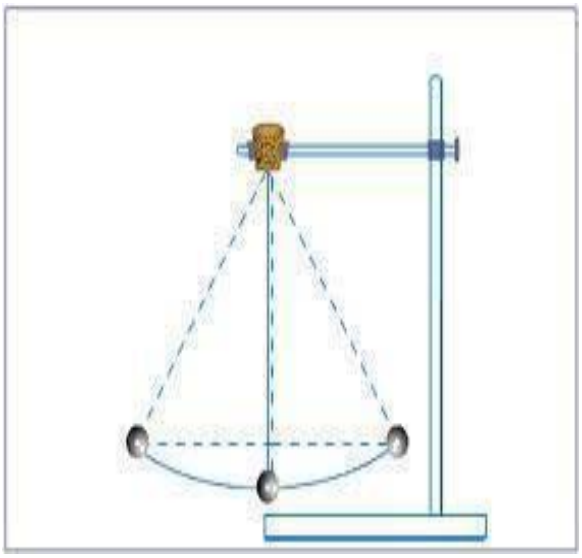
7) The SI unit of speed is
   a) m x s
   b) m/s
   c) km/h
   d) km/min

8) The motion of a simple pendulum is
   a) oscillatory
   b) rectilinear
   c) periodic
   d) circular

9) The clocks and watches which have an electric circuit with one or more cells are
   a) quartz clocks
   b) pendulum clocks
   c) water clocks
   d) digital clocks

10) The SI unit of distance is
   a) metre
   b) kilometre
   c) centimeter
   d) odometer

Label the diagram of simple pendulum given below :-



Label the following parts:-
Clamp stand, length of pendulum, bob, extreme positions, mean position, amplitude

Explain the following:-

Bob_____ -
_____
Oscillation _____

_____
Amplitude
_____

_____

Timeperiod – _____

_____

_____

Frequency - _____

_____

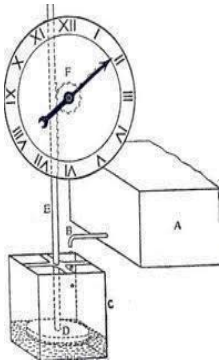
CHAPTER 13

MOTION AND TIME

Assignment 13.5

Identify the following devices and write them in the space provided:-

_____



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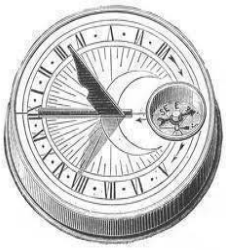

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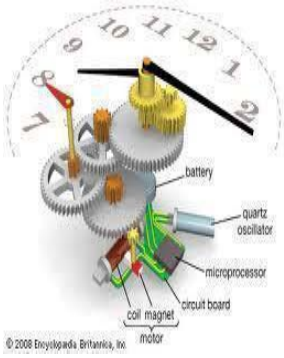


_____

_____

_____

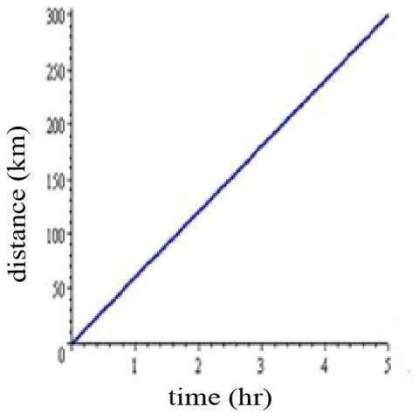
CHAPTER 13

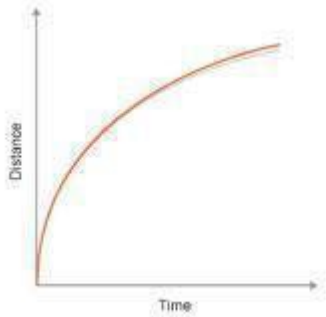
MOTION AND TIME

Assignment 13.6

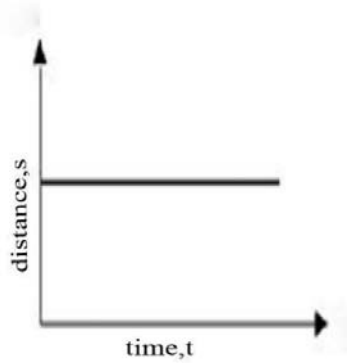
Answer the questions for each of the figure:-

1. **Interpret the motion** of the body in each of the graphs?





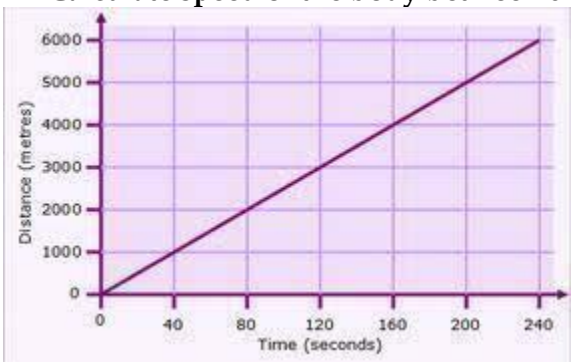
_____ _____



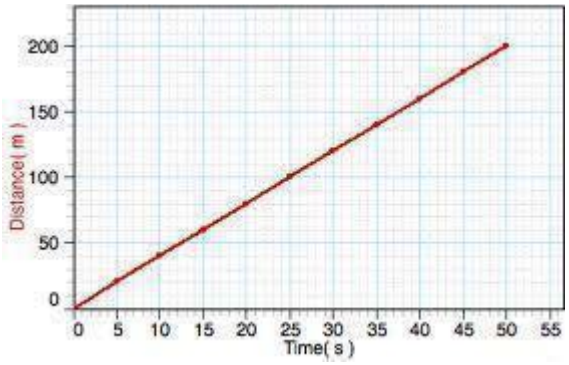
_____

2. **Calculate the speed for the given graphs :-**

a) Calculate speed of the body between 0 – 80 s and during the first 160 s graphically.



(b) Calculate the speed of the body during the **first 15 s and during the first 40 s graphically.**



c)Represent a distance-time graph to show -

-An object moving with non uniform speed.
- An object that is stationary.

CHAPTER 13

MOTION AND TIME

Assignment 13.8

Relation between speed, distance and time

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

or

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

or distance = speed x time

1. What is the speed of a car which travels **120 km in 2.5 h?**
2. Our school bus travels 15 km at a speed of 45 km/h. How much time will it take to reach school?
3. The distance travelled by our car in **20 min is 240 km**. Calculate its speed in km/h. Convert it into m/s.
4. **A ball is kept 1km away .** How long will a boy take to reach the ball if he runs at a speed of **50 m/s.**
5. A train covers **first 2000 m in 2h and the next 3000 m i**n 1h. Calculate its average speed.
6. **A tram covers 40 km in 1h and the next 80 km in 3h.** What is the average speed of the bus?
7. A car takes 20 min to cover a distance of 15 km. Find its speed in km/h and m/s.
8. What is the time period of a simple pendulum which completes **20 oscillations in 10 seconds?**

CHAPTER 13

MOTION AND TIME

Assignment 13.9

(A) Give one word for the following:-

- Distance travelled per unit time by an object – _____
- Time taken by a simple pendulum to complete one oscillation – _____
- Motion of an object moving in a straight line with constant speed – _____ _____
- Motion of a pendulum and hands of a clock – _____
- SI unit of speed – _____
- Shape of graph for an object moving with non-uniform motion – _____ _____
- Device to measure the distance moved by a vehicle – _____
- Device which records instantaneous speed of a moving vehicle - _____ _____
- SI unit of time – _____
- Clocks which have electric circuits with one or more cells - _____ _____

(B) Answer the following questions:-

a) What is meant by uniform motion and non – uniform motion? Give one example of each.

b) What are t**he S.I units** to measure distance and speed?

c) When is s body said to be in motion?

d) What is the SI unit of time period?

CHAPTER 13

MOTION AND TIME
Assignment 13.10

I Identify the type of motion exhibited by the following :-

1. A freely falling ball.
2. **A** housefly.
3. Motion shown by the plucked strings in a Veena**.**
4. Motion of the needle of a sewing machine.
5. Motion of an electric fan.

II Circle the odd one out and justify your answer :-

1. Amplitude, time period, frequency, velocity

2. Freely falling stone from a height, a car moving on a straight road, a revolving fan,

3. speed, second, distance, time

III Answer the following questions:-

1. Name some devices to measure time which were used before pendulum clocks became popular?
2. Write the SI units of

   (a) distance (b) time (c) speed
3. What type of motion is exhibited by a simple pendulum?
4. Plot distance-time graph for the following data and interpret its motion:-

(a)

Time (s)	0	20	40	60	80	100
Distance (m)	0	5	10	15	20	25

(b)

Time (s)	0	10	20	30	40
Distance(m)	2	4	5	8	10

CHAPTER 13

MOTION AND TIME

HIGH ORDER THINKING SKILLS

1. How is a stop watch different from an ordinary watch?

2. Pendulum clocks generally run fast in winter and slow in summer. Why?

3. The bob of a simple pendulum is made of wood. If it is replaced by a similar bob made of iron, how will it change the time period of the pendulum?

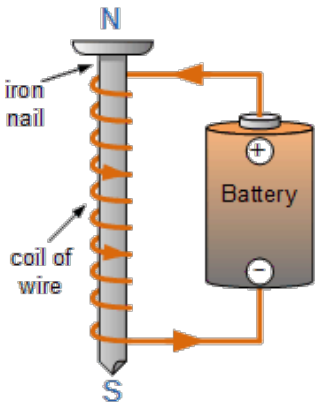
CHAPTER 14
ELECTRIC CURRENT AND ITS EFFECTS

Learning Outcomes:

- The students will be able to understand how circuits work.
- The students will be able to conduct experiment to identify conductors and insulators.
- The students will be able to identify circuit components and appreciate their use in circuits.
- The students will be able to make simple circuits and differentiate between closed and open circuits.
- The students will be able to study the magnetic effect of electric current.
- The students will be able to make their own electromagnets and study the change in their strength by conducting experiment.
- The students will be able to study the construction of circuit components like the dry cell, battery, incandescent bulb ,etc.
- The students will be able to appreciate the heating effect of electric current in safety device like fuse.

Smart Notes

Electromagnet-



A temporary magnet that shows magnetic properties only as long as electric current flows through it.

Solenoid-

A solenoid is a coil of insulated or enameled wire wound on a rod-shaped form, made of solid iron or solid steel.

Nichrome properties and uses-

It is an alloy of Nickel, Chromium and iron that has a high melting point and is used to make heating elements.Nichrome wire, however, when heated to red-hot temperatures, develops an outer layer of chromium oxide, and protects the heating element from further oxidation.

Because of its strength, ductility, resistance to oxidation, stability at high temperatures, and resistance to the flow of electrons, nichrome is widely used in electric heating elements.

Tungsten properties and uses-

It is a metal with a high melting point, is highly resistant to corrosion. and is incandescent(it glows when heated to a high temperature).

It is used to make the filament of an electric bulb.Pure tungsten has some amazing properties including the highest melting point (3695 K),, and greatest tensile strength out of all the metals.Because of these properties it is the most commonly used material for light bulb filaments. It can reach high temperature before melting and therefore emit a brighter light .

Fuse wire properties and material-

It is made up of an alloy of tin and lead. It has a low melting point and is used to check the flow of excessive current through a circuit.

Short circuit- It is caused when the live and neutral wires come into direct contact with each other. This results in excessive current being drawn into the circuit. Sparks are produced and can result in a major fire.

Overload- It is caused when excessive current is drawn into the circuit due to the simultaneous use of too many appliances that have a high power rating. This results in heating and can result in fire.

MCB- Miniature circuit breaker.

It is user friendly safety device that prevents the excessive flow of current into the circuit . It is being used in place of a fuse. It has a switch that automatically turns off , when the current exceeds the safe limit. It can then be easily turned on and the circuit is complete once again. These days MCB is more commonly used in low voltage electrical network than fuse. MCB has several advantages over fuse: MCB is more sensitive to current than fuse. It detects any abnormality in the current flow and automatically switches off the electrical circuit.

FUSE

- 

A device that is used to check the flow of excessive current in a circuit. A fuse wire is made up of an alloy of tin and lead that has a low melting point. The fuse wire melts and cuts off the flow of current in a circuit , if excessive current is drawn into the circuit. the fuse wire needs to be replaced if it melts due to heating. It works on the principle of the heating effect of current.

Both MCB and fuse protect electrical appliances from damage and prevent possible fires.

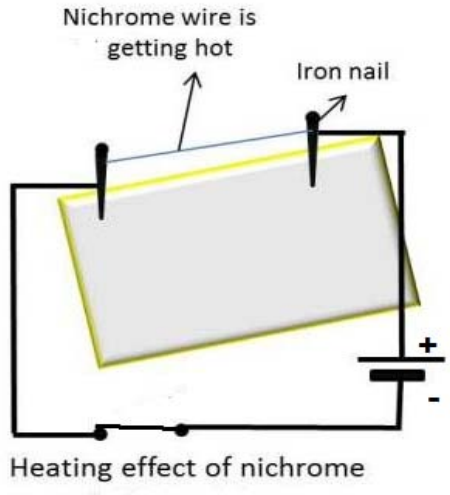
Activity 1

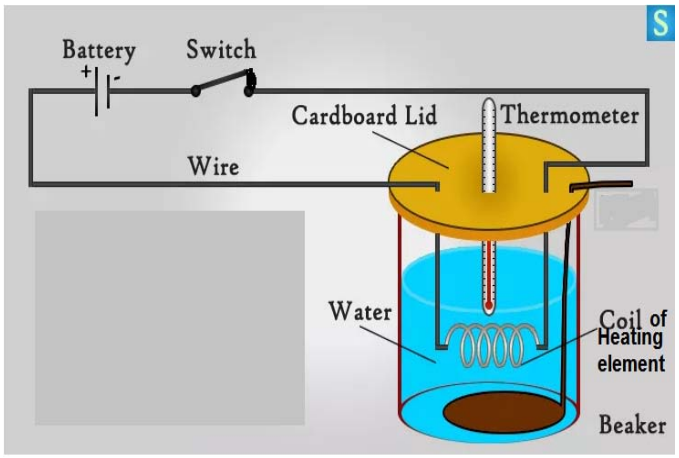
Aim: To observe the heating effect of current

Materials required: Battery eliminator, wires, heating element

Theory: When electric current flows through a wire, the wire becomes hot. This is called heating effect of current.

Diagram:





Procedure: 1. Connect the heating element with the battery eliminator using wires as shown in the circuit diagram.

2. Let the current flow through the wire and observe. (observation I)
3. Turn off the current now and put this heating element in a beaker with water.
4. Hang a thermometer in the beaker and note the initial temperature of water.
5. Turn on the current now and note the temperature of the water after some time. (observation 2)

Observation:

_____
_____
_____
_____

Conclusion:

_____
_____
_____
_____

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

Activity 2

Aim: To observe the magnetic effect of current or To make an electromagnet.

Materials required: Battery eliminator, wires, a solenoid, magnetic compass, alpins

Theory: When electric current flows through a wire,a magnetic field is produced. This is called magnetic effect of current.

Diagram:

Procedure: 1. Connect the solenoid (**A solenoid is a coil of insulated or enameled wire wound on a rod-shaped form made of solid iron OR solid steel**) with the battery eliminator using wires as shown in the circuit diagram.

2. Let the current flow through the wire .
3. Bring a magnetic compass near it and observe.
4. Keep some alpins near the solenoid / wire and observe.

Observation:

_____
_____
_____
_____

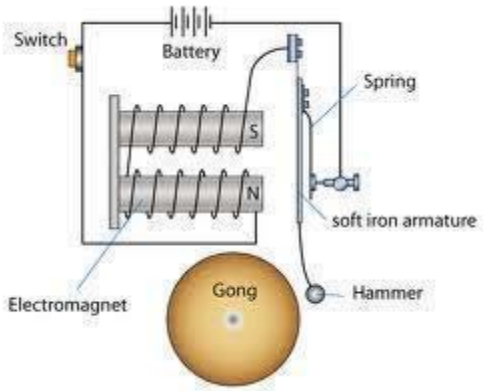
Conclusion:

_____
_____
_____

CHAPTER 14
ELECTRIC CURRENT AND ITS EFFECTS

Activity 4

CONSTRUCTION AND WORKING OF ELECTRIC BELL



Construction: - An electric bell consists of a coil of wire wound on an iron piece. This coil acts as an _____. An iron strip with a hammer at one end is kept close to the electromagnet. There is a contact screw near the iron strip. A gong is placed near the hammer. The circuit is made as shown in the diagram.

Working: - When the _____ is completed, current flows through the coils of the _____. It attracts the _____ that is attached to the hammer. The hammer moves with it and hits the _____, but the circuit is now _____ at the point X of the contact screw. The electromagnet loses its _____ and no longer attracts the iron strip (soft iron armature). The _____ moves back to its original position and makes contact at X, thus completing the _____ again. This cycle is then repeated as long as the switch is on

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

Assignment 14.1

Fill in the blanks:-

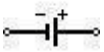
a) A filament of low melting point is used in making a _____.

b) The working of an electric fuse is based on _____ effect of current.

c) Nichrome is used for making _____ and has a high melting point.

d) The metal used as a filament of a bulb is ---------- ,which has a property of glowing when it gets heated and has a high melting point.

e)  is the symbol of _____ _____.

f)  is the symbol of _____.

g) The wires used for connections in a simple circuit **is made up of** _____**.**

2. Match the following -

COLUMN A	**COLUMN B**
A. electric current	a. low melting point
B. electric cell	b. magnetic effect
C. electric fuse	c. current does not flow
D. electric iron	d. heating effect
E. electric bell	e. +ve to –ve terminal
F. open circuit	f. source of current

Activity 5

Aim-To determine the relationship between the strength of an electromagnet and its number of turns of the copper wire.

Materials required- Iron nails, copper wire, battery eliminator, safety pins.

Theory-

Diagram-

Procedure-

1. Connect the electromagnet having **60 turns of th**e copper wire to a 4V battery, and observe the number of pins attracted by the electromagnet.
2. Repeat the above activity using electromagnets having **80 turns and 100** turns of the copper wire.
3. Record our observations in a tabular form.

Observations-

S. No.	Number of turns of the wire	Number of pins attracted
1		
2		
3		

Conclusion-

CHAPTER 14
ELECTRIC CURRENT AND ITS EFFECTS

Assignment 14.2

Write the correct option with the option number for the following in the space provided.

1. When an electric current passes through a wire, the wire gets hot. This is called
   (a) electricity (b) conduction
   (c) Joule heating (d) none of these

2. An electric fuse is
   (a) a safety device (b) used to produce current
   (c) used to heat a room (d) an electric appliance

3. In an electric bell, we can find
   (a) electromagnet (b) hammer
   (c) interrupter (d) all of these

4. Which of these does not use the heating effect of current?
   (a) electric toaster (b) electric fan
   (c) electric iron (d) room heater

6. In a simple circuit of cell, switch and a bulb, if the filament is broken the circuit is
   (a) complete (b) incomplete
   (c) complete but bulb doesn't glow (d) either (a) or (c)

7. The strength of electromagnet can be increased by
   a) increasing the number of turns of coil
   b) increasing the current
   c) Both (a) and (b) together
   d) Either (a) or (b)

8. An electric fuse wire melts when current flowing through it is
   a) more than the maximum amount
   b) less than the maximum amount
   c) more than the minimum amount
   d) less than the maximum amount

9. In an electric bell, when circuit is complete the hammer hits the
   (a) soft iron strip (b) contact screw
   (c) gong (d) electromagnet

10. When a magnetic compass is brought near a current carrying wire, the needle of the compass
   a) points towards south
   b) points towards north
   c) does not move at all
   d) deflects

Give one word for the following:-

a) A group of cells joined together – _____

b) Magnet produced by current carrying coil – _____

c) A safety device which protects our electric appliances – _____

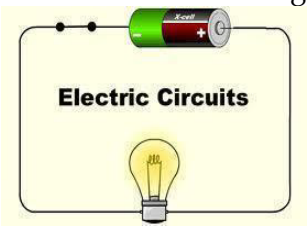
d) Representation of electric components using symbols in a circuit – _____

e) This is replacing fuse in our household circuits – _____

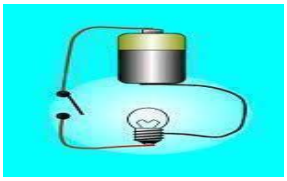
CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS
Assignment 14.3

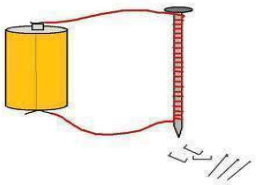
1. Draw the circuit diagram for the given figure.



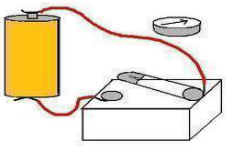
2. Draw the circuit diagram for the given figure **and name the components.**



3. Which scientific concept is demonstrated by this figure?



4. What happens to the needle of the magnetic compass?



5. Draw the symbols for the following electric components.

(a) a cell

(b) a battery of 4 cells

(c) connecting wire

(d) bulb in 'on' position

(e) bulb in 'off' position

(f) open switch

(g) closed switch

CHAPTER 14
ELECTRIC CURRENT AND ITS EFFECTS

Assignment 14.4 (to be done in the notebook)

1. Why do we use a soft iron core in an electromagnet?

2. Write 3-4 practical applications of electromagnet.

3. Mention the factors that affect the strength of an electromagnet?

4. What is an electric fuse? On what principle does it work?

5. In a simple circuit of a cell, switch and a bulb connected with wires, on passing current for some time, the bulb becomes hot but the wires do not. Why?

6. What is an electromagnet? Draw a neat labelled diagram of the same.

7. Who was the first person to observe deflection of compass needle when current passes through a nearby wire?

8. Draw a circuit diagram using a battery of 4 cells, a plug key, bulb, connecting wires to show a closed circuit?

9. Draw a circuit diagram using a battery of 2 cells, a tap key, bulb, connecting wires to show an open circuit?

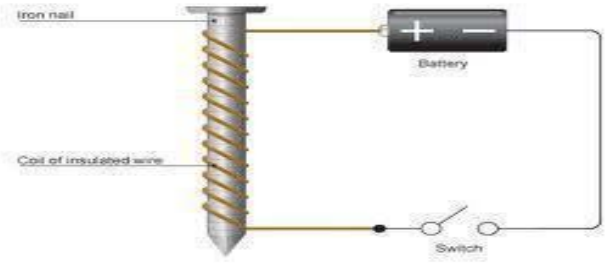
10. What is an MCB ?

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

Assignment 14.5

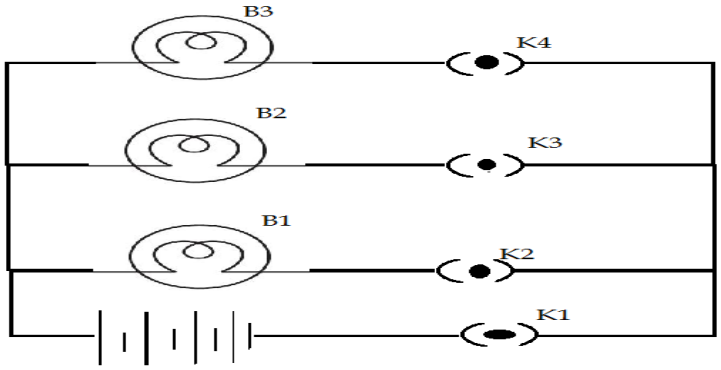
1. Study the figure below and fill in the blanks:-



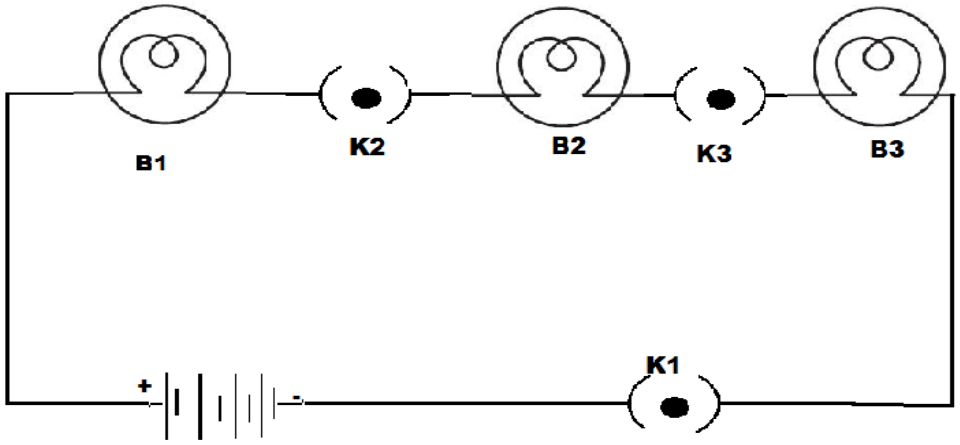
The figure above shows the working of a/an _____. In this a coil of wire or a solenoid is wound around an _____ . When ----------is allowed to pass through the wire, the iron nail becomes _____. When the _____ is turned off, the iron nail loses its _____.

Assignment
Laboratory Activity
Class VII

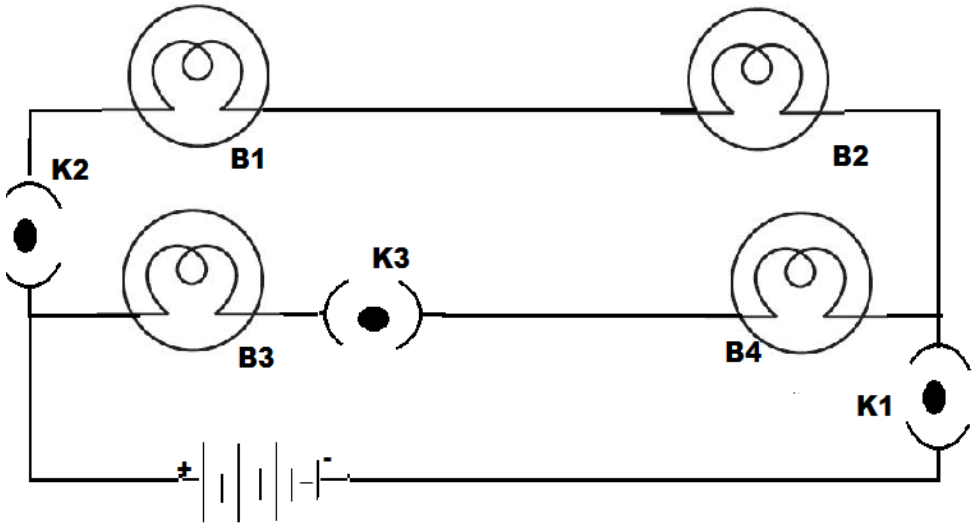
1. Study the circuits given below, examine and answer the following questions:



Key/ Keys which is switched OFF	Bulb/bulbs that will glow	
	Expected/ assumed	Experimentally verified
K1		
K2		
K3		
K4		
K2 & K3		
K3 & K4		
K2 & K4		



Key/ Keys which is switched OFF	Bulb/bulbs that will glow	
	Expected/ assumed	Experimentally verified
K1		
K2		
K3		
K2 & K3		

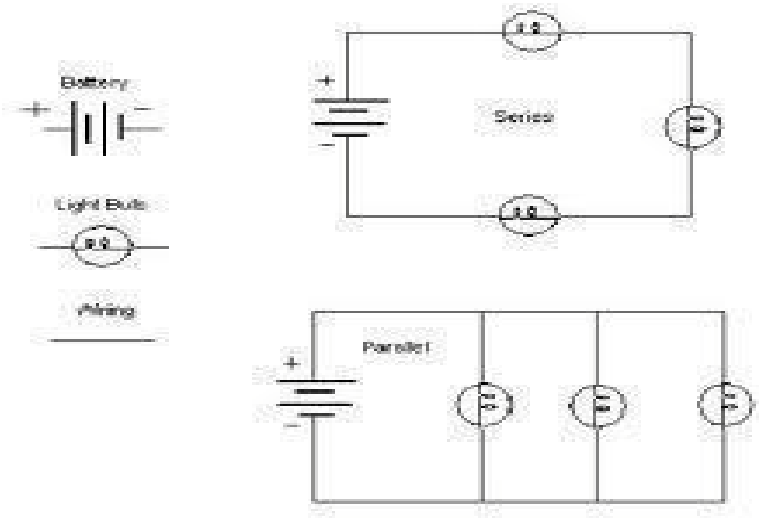


Key/ Keys which is switched OFF	Bulb/bulbs that will glow	
	Expected/ assumed	Experimentally verified
K1		
K2		
K3		
K2 & K3		
K1 & K2		

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

HIGH ORDER THINKING SKILLS



1. In the two figures, the three bulbs are connected as shown in the figure:-

   a.Name the two ways in which the bulbs are connected ?

   b. In which of the above is the same amount of current flowing through the bulbs?

   c. In which of the above is the total current split across the three branches ?

2. What is the color convention for live, neutral and earth wires?

3. There are different electrical appliances used in our houses – are they connected in series or parallel?

4. Silver is a better conductor than a copper and aluminium. Then, why do we use copper and aluminium to make wires to carry electric current?

CHAPTER 15

LIGHT

Learning Objectives:

- The students will be able to study reflection and its laws.
- The students will be able to differentiate between a real and a virtual image.
- The students will be able to experimentally verify the laws of reflection.
- The students will be able to draw the diagram of reflection through a plane mirror and study the nature of the image formed by it.
- The students will be able to identify spherical lenses and mirrors.
- The students will be able to differentiate between a spherical mirror and spherical lens.
- The students will be able to draw the ray diagram of a converging spherical mirror and lens to identify their nature.
- The students will be able appreciate the use of spherical mirrors and lenses in daily life.

Smart notes

Light is a form of energy.
Reflection: The bouncing back of light when it strikes a surface is called reflection.
Plane mirror: It is a flat polished reflecting surface.
Reflection through a plane mirror

Incident Ray :the ray of light that strikes the surface
Reflected Ray: the ray of light after bouncing back from the surface
Angle of incidence: the angle between the incident ray and the normal
Angle of reflection: The angle between the reflected ray and the normal

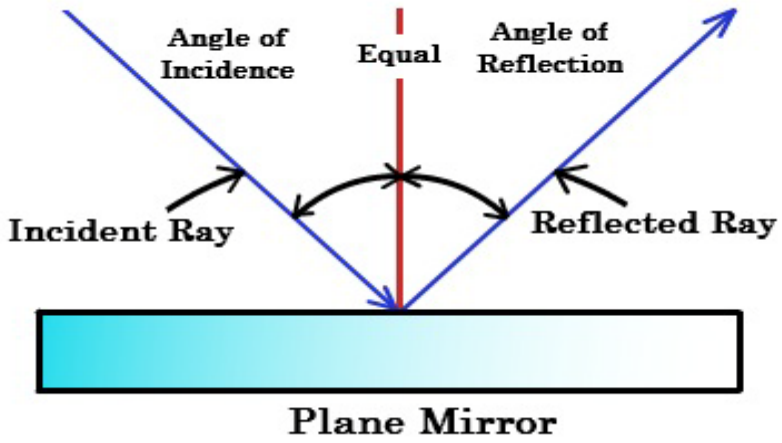
Activity 1

Aim: - To study reflection of light

Materials required:- A plane mirror strip, a mirror holder, a laser light, a protractor , a ruler, pencil

Theory: - The phenomenon of bouncing back of light when it strikes a surface is called reflection.
Laws of reflection:
I The incident ray, the reflected ray and the normal at the point of incidence all lie on the same plane.
II The angle of incidence is always equal to the angle of reflection.

Diagram:



Procedure :-

_____
_____
_____
_____

Observation:_____
_____
_____

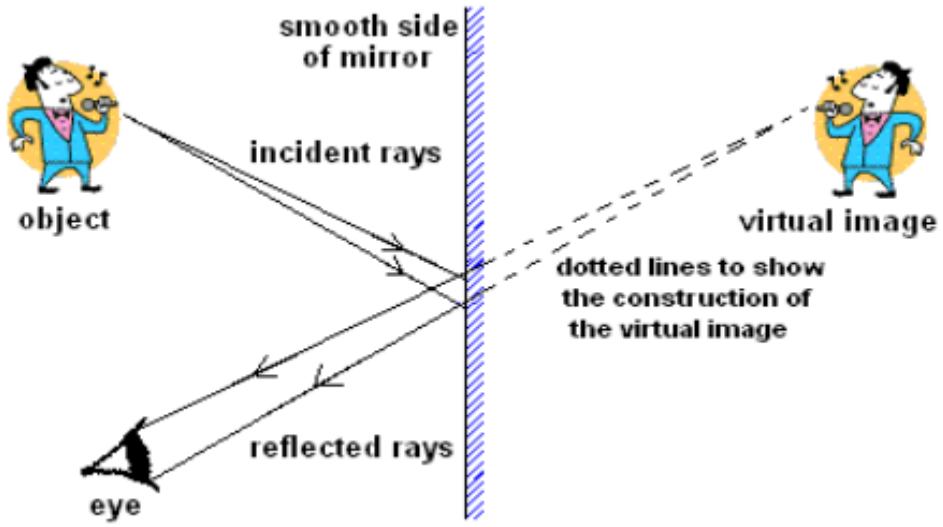
Conclusion:

_____
_____

CHAPTER 15

LIGHT

Activity 3



To study the characteristics of the image formed by a plane mirror

a) Stand in front of a plane mirror and answer the following questions:-

a) Is your image in the mirror upright or inverted? _____

b) Raise your right hand. What do you observe in the mirror?

_____

_____

c) Stand at a distance from the plane mirror and start walking towards the mirror. What happens to your image?

_____

_____

d) Compare your height with the height of the image formed.

_____

_____

e) Take a new stainless steel spoon and bring its both sides towards your face and observe.

Observation 1 _____

Observation 2 _____

CHAPTER 15

LIGHT

Assignment 15.1

1. Differentiate between plane mirror and spherical mirror.

PLANE MIRROR	SPHERICAL MIRROR
1. It is formed by painting one side of a plain glass piece.	1. It is obtained from a spherical glass cut into pieces.
2. the type of image formed by a plane mirror is always _____ and _____	2. It may form _____, _____ or _____ sized image.
3. It is of _____ type.	3. It is of two types - _____ and _____

2. Differentiate between Real and Virtual images.

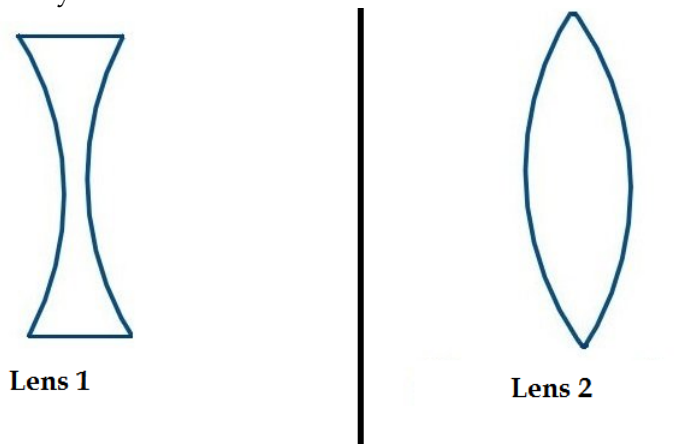
REAL IMAGES	VIRTUAL IMAGES
1. They are formed by _____ intersection of rays by mirrors and lenses.	1. They are formed when light rays appear to _____ intersect by mirrors and lenses.
2. They are always _____.	2. They are always _____.
3. They _____ obtained on a screen.	3. They _____ obtained on a screen.

CHAPTER 15

LIGHT

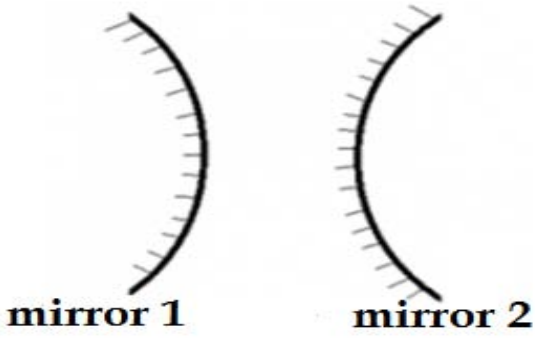
Activity 4

(A) To identify the convex and concave lenses

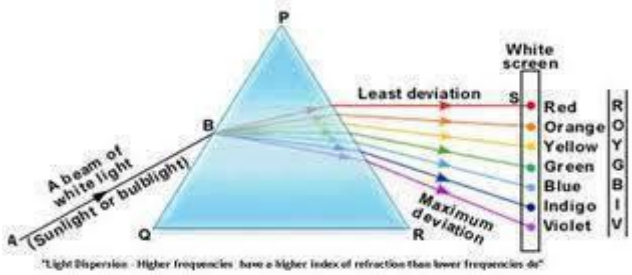


Activity	**Lens 1**	**Lens 2**
Place the lens on a plane surface, slide a paper below the lenses		
Touch the centre and then sides of each lens		
Place the lens above a text and observe the text size.		
Conclusion		

(B) To identify the convex and concave mirrors



Activity	**Mirror 2**	**Mirror 1**
Slide a paper below the mirror after placing the reflecting surface of the mirror downward on a plane surface. Touch the reflecting surface of the mirror.		
Bring your face close to the mirror and observe your image		
Conclusion		



1. PQR is a _____. When _____ falls on a _____, the _____ splits into the _____ colours. This phenomena of splitting of _____ into seven colours is called _____.

The band of seven colours obtained is called _____.

Match the following:-

Column A	Column B
Real image	plane mirror
Virtual image	travels in straight line
Rectilinear propagation	cannot be formed on screen
Periscope	seen on screen

CHAPTER 15

LIGHT

Assignment 15.3

I. Fill in the blanks:-

a) Any polished shiny surface acts as a _____.

b) _____ image can be obtained on a screen.

c) _____ image cannot be obtained on a screen.

d) Images formed by _____ lenses are real and inverted.

e) _____ light is composed of seven colors.

f) A magnifying glass is a _____ lens.

g) The headlights of cars and scooters are _____ in shape.

h) _____ mirror and _____ lens shows lateral inversion.

i) The phenomenon in which light that strikes a surface is thrown back in the same medium-

a) Spherical mirror whose reflecting surface is bulged out is called _____ mirror.

b) An energy which gives us sensation of vision –

2. Circle the odd one out and justify :-

(a) Electric bulb, sun, moon, fire

(b) Shadow, image, eclipse, expansion

(c) Shaving mirror, dentist's mirror, rear view mirror, street lamp

II. Choose the correct option(s) and write in the space provided:-

1. An image is seen when light is reflected from
   a) all surfaces
   b) plane mirror
   c) highly polished surface
   d) cardboard

2. A plane mirror produces a/an _____ image.
   a) laterally inverted
   b) erect
   c) virtual
   d) all of these

3. All rays of light travel in a _____ line.
   a) Straight
   b) Curved
   c) haphazard
   d) both (a) and (b)

4. Newton's disc, if rotated rapidly appears
   a) bluish
   b) greenish
   c) whitish
   d) yellowish

CHAPTER 15

LIGHT

Assignment 15.5

1. A girl is standing 2m away in front of a plane mirror.

   (a) What is the distance between the girl and the mirror?

   (b) What is the distance between the girl's image and the mirror?

   (c) What is the distance between the girl and her image?

2. You are given three mirrors – a plane mirror, a convex mirror and a concave mirror. How will you identify them without touching them?

3. Irrespective of where you stand in front of a mirror, your image is always erect. What type of mirror is it?

4. Is the image formed real or virtual – in a plane mirror and on a cinema screen?

5. Why is AMBULANCE written like this?

6. Which property of light is exhibited by shadow formation?

Activity

SMOKE BOX ACTIVITY

The smoke box is filled with smoke and light from two laser torches are incident inside the box.

The mirrors and lenses are placed inside the box one by one and observed.

CHAPTER 15

LIGHT

Refraction: When a ray of light passes from one medium to another, it changes its path. This phenomenon is called refraction.
Spherical Lens: A transparent

Assignment 15.2

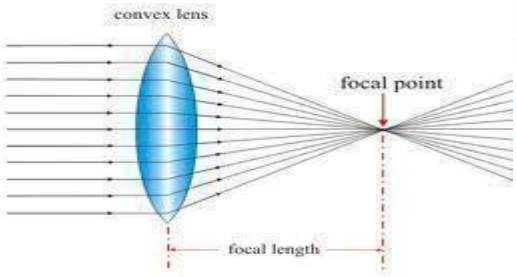


Fig 1

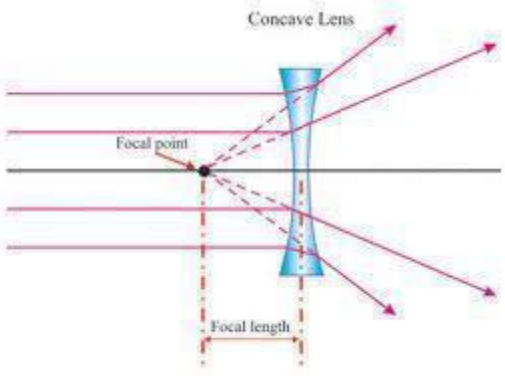


Fig 2

1. Fig 1 shows a _____ lens and fig 2 shows a _____ lens.
2. Convex lens is also called _____ lens.
3. Concave lens is also called _____ lens.

CHAPTER 15

LIGHT

HIGH ORDER THINKING SKILLS

1. Can you show dispersion using beaker of water, a plane mirror, a sheet of paper and sunlight?
2. Why does the blue box look blue? Is it always blue? What about in the dark or under a red light?
3. An air bubble formed inside water acts like a lens. Is it concave or convex?
4. How is a rainbow formed? Can a complete circular rainbow be formed?
5. If earth had no atmosphere, what would have been the colour of the sky?
6. What types of lenses are used in microscopes and telescopes and why?

ACTIVITY No.-2

LIGHT

Aim: - To observe rectilinear propagation of light.

Materials Required: - A lighted candle or a bulb and a drinking straw.

Theory: - The light always travels in a straight line. This property is known as rectilinear propagation of light.

Procedure: - 1. Stretch the straw straight and try to look at the candle or bulb on the other side.
2. Now bend the tube and try to look through.

Observations: -

The best shape of the straw that helps you to see the flame is _____.

Inference: - The light travels in a _____, which is also known as _____.

DIAGRAM :-

Chapter 17

Forests: Our Lifeline

- This chapter would not be evaluated in the exam and would be done as a project.

Water, waste water

This chapter would be done by project method and would not be evaluated in the exam.

Prepare a poster on water pollution

Kahoot quiz on water and waste water

Worksheets

LANGUAGE OF CHEMISTRY

Smart Notes

Just like 26 letters make up an entire English language, a few elements are a basis of all chemical reactions. This makes it necessary for us to understand this exciting new language, the language of chemistry.

J.J. Berzelius laid the foundation of language of chemistry in the early 19th century. In this, an atom is represented by a symbol, a molecule by a formula and a chemical reaction by a chemical equation. Let us learn more about what each of these terms mean and how are they allotted to a substance to make it meaningful and easy to understand.

Symbols

Early scientists used pictures to denote elements (pure substances made up of identical atoms). As more elements were discovered this was not possible. Every element is now denoted by a symbol/ English alphabet. A symbol is the short hand representation of an element. It represents-

An element in particular
An atom of an element

For ex- the symbol H represents one atom of the element hydrogen.

The symbols were allotted in a systematic manner-
I The first letter of the English name of the element is written in Capital letter. For example

Name	Symbol	Name	Symbol
Carbon	C	Nitrogen	N
Hydrogen	H	Oxygen	O
Fluorine	F	Sulphur	S
Phosphorus	P	Boron	B

II The first letter of the English name written in Capital followed by another letter from the name written in Small(this becomes necessary when two elements share the same first letter)

For example-

Name	Symbol	Name	Symbol
Helium	He	Aluminium	Al
Neon	Ne	Calcium	Ca
Nickel	Ni	Chlorine	Cl
Magnesium	Mg	Zinc	Zn
Manganese	Mn	Barium	Ba

III One or two letters of the Latin name of the elements with the first letter written in Capital and the second written in Small. For example

Name	Latin name	Symbol
Sodium	Natrium	Na
Potassium	Kalium	K
Iron	Ferrum	Fe
Copper	Cuprum	Cu
Silver	Argentum	Ag
Gold	Aurum	Au
Mercury	Hydrargyrum	Hg
Tin	Stannum	Sn
Lead	Plumbum	Pb

Atomicity

The atomicity is the number of atoms of an element present in a molecule(the molecule may be of an element or a compound).

Some examples of molecules of elements are-

Atomicity	Element	Exists as
Monoatomic/Atomicity 1	Helium	He
	Neon	Ne
Diatomic/atomicity 2	Hydrogen	H_2
	Oxygen	O_2
	Nitrogen	N_2
	Chlorine	Cl_2
Triatomic/atomicity 3	Ozone	O_3
Polyatomic/ atomicity >3	Phosphorus	P_4
	Sulphur	S_8

Exercise-
Identify the elements present in the following molecules and write their atomicity-

- H_2SO_4
- HCl
- $Ca(OH)_2$
- $(NH_4)_2SO_4$
- $Al_2(SO_4)_3$

Valency :Valency is the combining capacity of an element or a group of atom combined together(radical/ion).
For example- Valency of hydrogen is 1. This means that a hydrogen atom needs to combine with I more atom to make a molecule.
Valencies of different elements are different. You will learn in higher classes about how these valencies are derived.

The valencies of some elements and compound radicals (groups of atoms) are given below-

Positive radicals		
Name	Valency	Radical representation
Sodium	1	Na^+
Potassium	1	K^+
Hydrogen	1	H^+
Copper/Cuprous	1	Cu^+
Ammonium	1	NH_4^+
Magnesium	2	Mg^{2+}
Zinc	2	Zn^{2+}
Copper/Cupric	2	Cu^{2+}
Iron/Ferrous	2	Fe^{2+}
Calcium	2	Ca^{2+}
Aluminium	3	Al^{3+}
Iron/Ferric	3	Fe^{3+}

Negative radicals		
Name	Valency	Radical representation
Chloride	1	Cl^-
Fluoride	1	F^-
Bromide	1	Br^-
Iodide	1	I^-
Nitrate	1	NO_3^-
Nitrite	1	NO_2^-
Hydroxide	1	OH^-
Bicarbonate	1	HCO_3^-
Oxide	2	O^{2-}
Sulphide	2	S^{2-}
Sulphate	2	SO_4^{2-}
Sulphite	2	SO_3^{2-}
Carbonate	2	CO_3^{2-}
Phosphate	3	PO_4^{3-}
Nitride	3	N^{3-}
Carbon	4	C^4

Chemical formula

A chemical formula is the short hand representation of a chemical compound which is written using symbols of the elements involved. Let us learn how to deduce the chemical formula of an ionic chemical compound comprising of a positive and a negative radical or a metal and a non metal.

Steps for writing a chemical formula-

I Write the symbols of the radicals side by side, keeping the positive radical on the left and the negative radical on the right.
For example- Na O

II Write the valencies of the radicals on their top right hand side.
For Example- Na^{1+} O^{2-}

III Cross the valencies and write them as sub-scripts.(the valency of the negative radical becomes the atomicity of the positive radical and vice versa). The charges on the radicals are NOT written in the chemical formula.
For example- Na^{1+} O^{2-}
Na_2O

IV If possible, bring the valencies to the lowest terms.
For example- Ca^{2+} O^{2-}
Ca_2O_2 or CaO

V If a radical has more than element, keep it in a bracket. The atomicity of the individual atoms in such a radical cannot be brought to lowest terms.
For example- Ca^{2+} SO_4^{2-}
$Ca_2(SO_4)_2$ or $CaSO_4$ (The number 4 here cannot be cancelled). Also, the formula cannot be written as $Ca_2S_2O_8$

Exercise

Now write the chemical formulae for the following compounds-

a) Hydrogen chloride

b) Aluminium hydroxide

c) Sodium sulphate

d) Calcium carbonate

e) Carbon dioxide

f) Magnesium chloride

g) Aluminium oxide

h) Potassium nitrate

i) Magnesium phosphate

j) Hydrogen sulphide

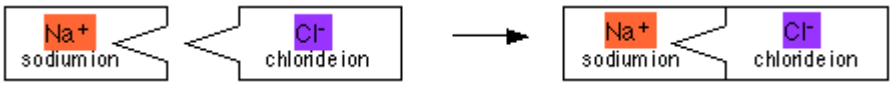
Let us do

WRITING CHEMICAL FORMULAE

Here is an activity which is both visual and kinaesthetic that can be used to help students at various levels learn to write, or practice writing chemical formulae.

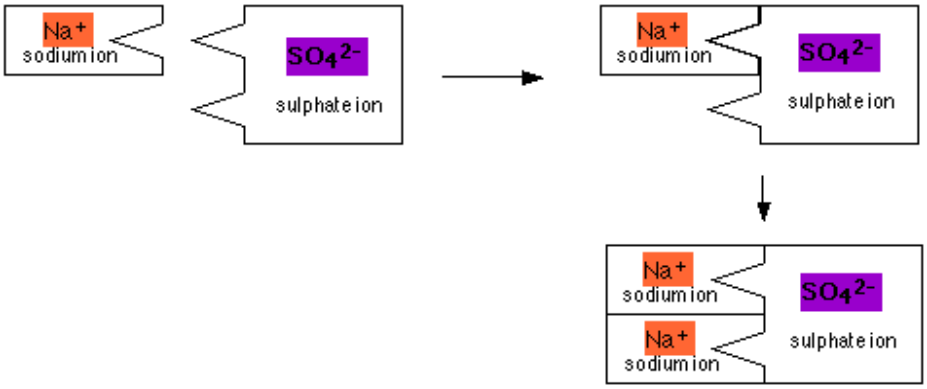
A series of cards representing common anions and cations are used. Each card has both the symbol and name of the ion written on them.

For example, students are given the cards and asked to write the formula for sodium chloride



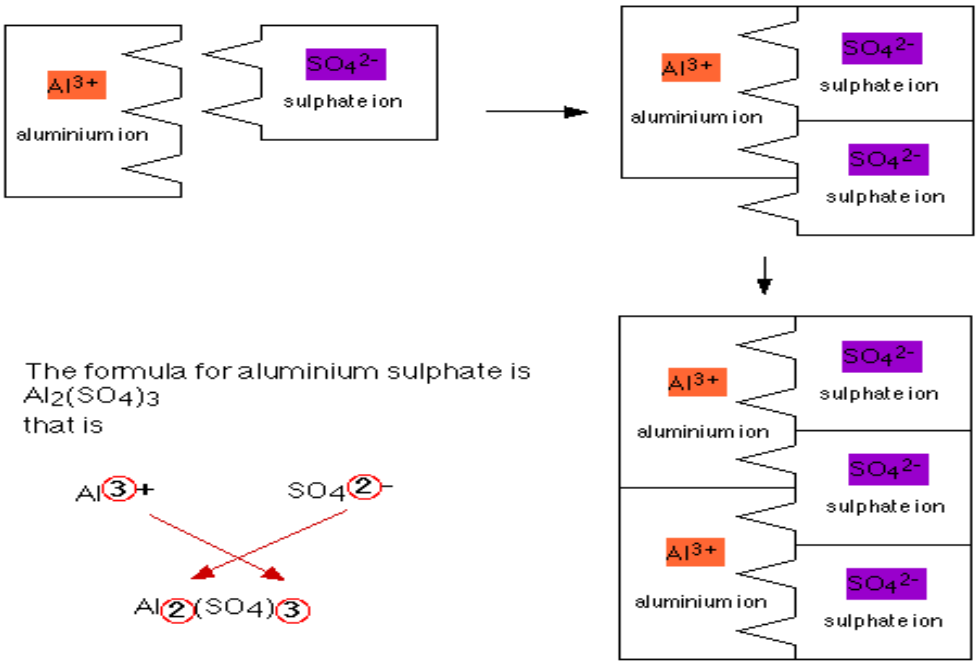
This requires one sodium ion (card) and one chloride ion (card), therefore the formula for sodium chloride is written NaCl.

Similarly for sodium sulphate



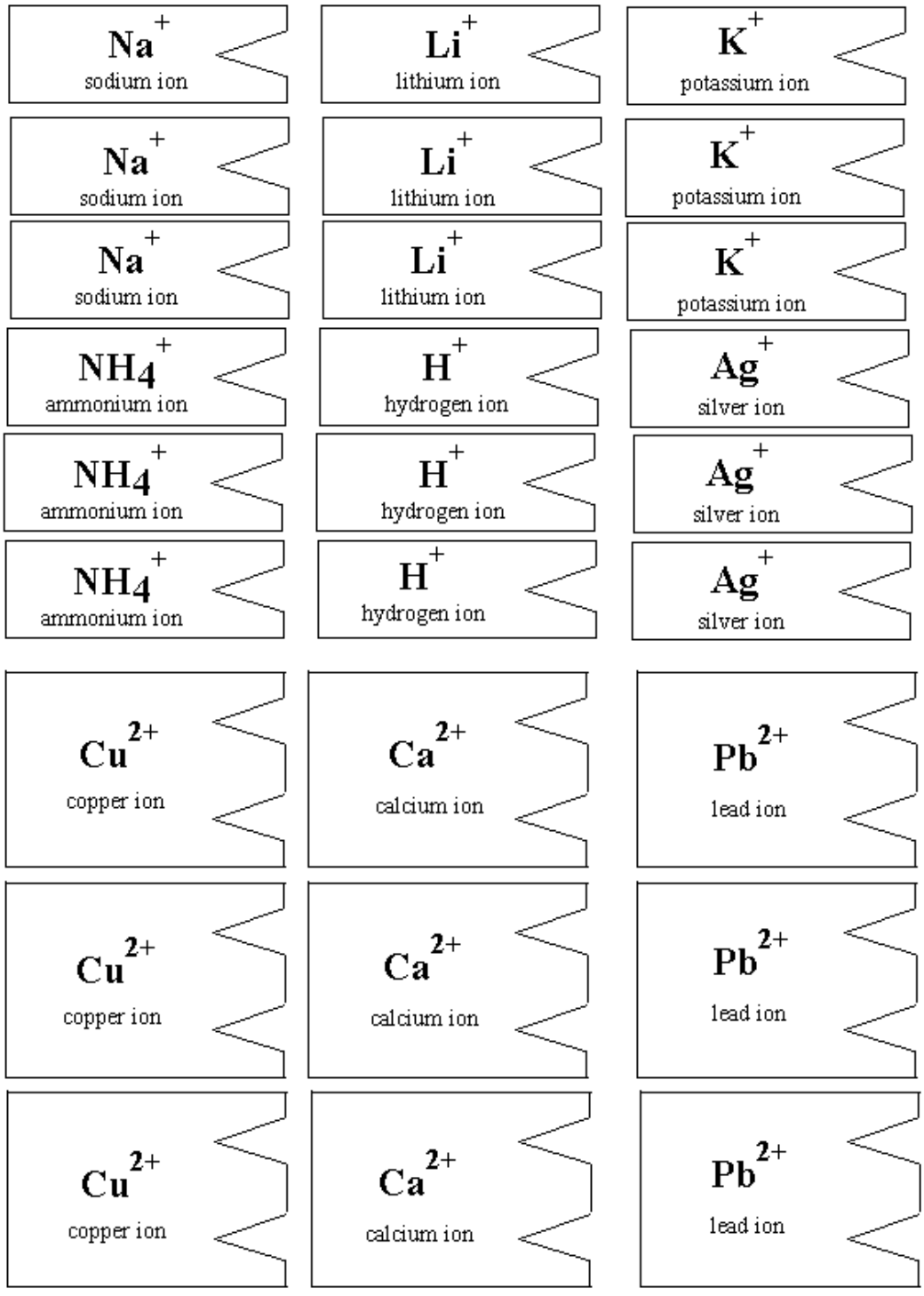
This requires <u>two</u> sodium ions (cards) and one sulphate ion (card), therefore the formula for sodium sulphate can be written Na_2SO_4.

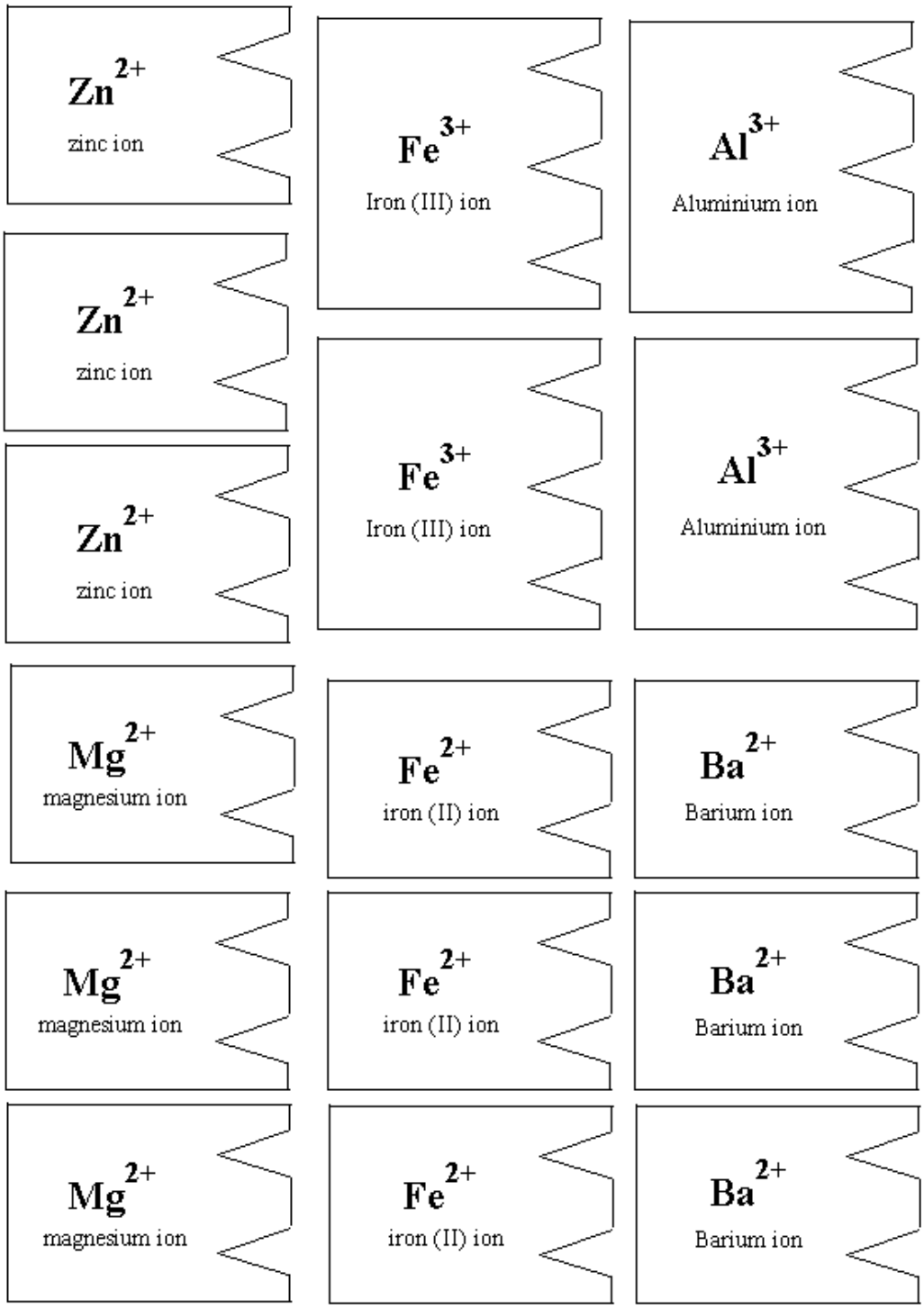
These cards can also be used as an assessment task where students discover the '<u>rule</u>' for writing chemical formulae for themselves.



The formula for aluminium sulphate is $Al_2(SO_4)_3$
that is

So, here you go. Just cut out the cards given on the next few pages, pages them on a hard paper and you are ready to take the challenge of chemical formulae.




Zn^{2+}
zinc ion
Zn^{2+}
zinc ion
Zn^{2+}
zinc ion
Fe^{3+}
Iron (III) ion
Fe^{3+}
Iron (III) ion
Al^{3+}
Aluminium ion
Al^{3+}
Aluminium ion
Mg^{2+}
magnesium ion
Mg^{2+}
magnesium ion
Mg^{2+}
magnesium ion
Fe^{2+}
iron (II) ion
Fe^{2+}
iron (II) ion
Fe^{2+}
iron (II) ion
Ba^{2+}
Barium ion
Ba^{2+}
Barium ion
Ba^{2+}
Barium ion

Cl^-
Chloride ion

F^-
Fluoride ion

I^-
Iodide ion

Cl^-
Chloride ion

F^-
Fluoride ion

I^-
Iodide ion

Cl^-
Chloride ion

F^-
Fluoride ion

I^-
Iodide ion

NO_2^-
Nitrite ion

OH^-
Hydroxide ion

NO_3^-
Nitrate ion

NO_2^-
Nitrite ion

OH^-
Hydroxide ion

NO_3^-
Nitrate ion

NO_2^-
Nitrite ion

OH^-
Hydroxide ion

NO_3^-
Nitrate ion

O^{2-}
Oxide ion

CO_3^{2-}
Carbonate ion

SO_4^{2-}
Sulphate ion

O^{2-}
Oxide ion

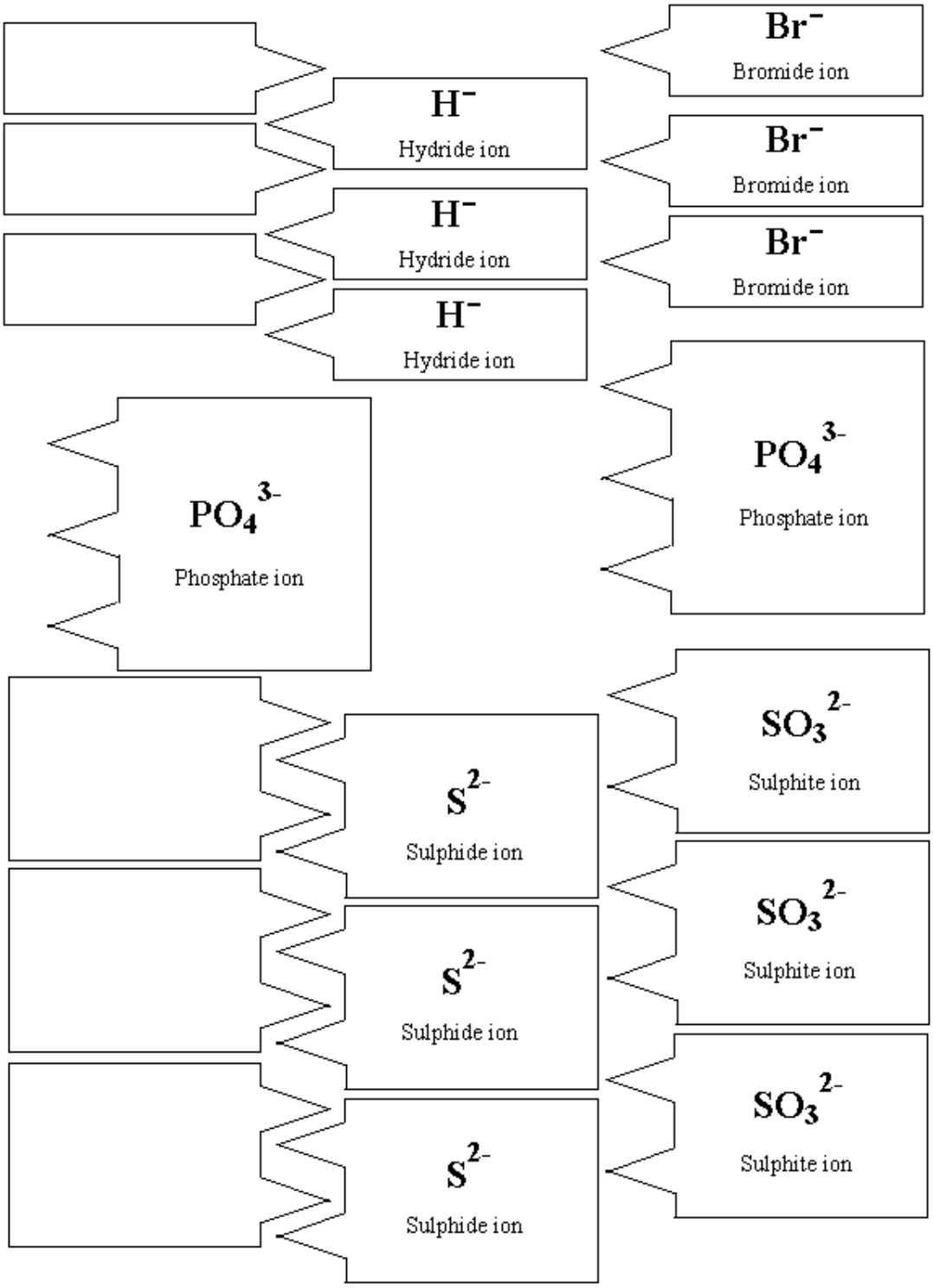
CO_3^{2-}
Carbonate ion

SO_4^{2-}
Sulphate ion

O^{2-}
Oxide ion

CO_3^{2-}
Carbonate ion

SO_4^{2-}
Sulphate ion


H^-
Hydride ion
H^-
Hydride ion
H^-
Hydride ion
Br^-
Bromide ion
Br^-
Bromide ion
Br^-
Bromide ion
PO_4^{3-}
Phosphate ion
PO_4^{3-}
Phosphate ion
S^{2-}
Sulphide ion
S^{2-}
Sulphide ion
S^{2-}
Sulphide ion
SO_3^{2-}
Sulphite ion
SO_3^{2-}
Sulphite ion
SO_3^{2-}
Sulphite ion

Steps for naming a chemical compound

I Write the name of the metal/ positive radical (the first alphabet written in capital) followed by the name of the negative radical/non-metal (written in small).

II Note- The names of the metal and radicals remain the same. The name of the non-metal is written endind in " –ide".

For example-

NaCl- Sodium chloride

NH_4OH- Ammonium hydroxide

III The names of radicals consisting of more than one atom remains the same. For example- Carbonate (CO_3), hydroxide (OH^-)

IV In case of variable valency, the radical with a lower valency ends in **–ous** while the higher valency is written as **–ic.**

For example Ferrous sulphate (Fe^{2+}), Ferric chloride (Fe^{3+})

Now write the chemical names of the following compounds-

a) Na_2O

b) $AlCl_3$

c) $Ca_3(PO_4)_2$

d) KNO_3

e) $FeSO_4$

f) $CaCl_2$

g) NH_4NO_3

h) Na_2CO_3

i) $Mg(HCO_3)_2$

j) Ag_2S

Writing word Equations

A chemical equation is a short hand representation of a chemical change. It is written using the symbol and formulae of the substances involved.

A chemical equation has two parts-

Reactants- These are the substances which take part in a chemical reaction. They are written on the left hand side of the equation.

Products- These are the substances which are formed as a result of the chemical reaction. These are written on the right hand side of the chemical equation.

For example- A chemical reaction between magnesium and oxygen can be written as follows-

Magnesium + Oxygen -⟶ Magnesium oxide

This chemical equation can be read as follows-

Magnesium combines with oxygen to form magnesium oxide. Magnesium and oxygen are the reactants while magnesium oxide is the product.

Exercise-

Represent the following chemical reactions as word equations and identify the reactants and the products-

a) Hydrogen gas combines with oxygen gas to form water.

b) Hydrochloric acid reacts with sodium hydroxide to form sodium chloride and water.

c) Sodium metal burns in air to form sodium oxide.

d) Iron reacts with copper sulphate to form ferrous sulphate and copper

e) Carbon dioxide dissolves in water to form carbonic acid

Classify each of the following as an element [E], a compound [C], or a mixture [M].

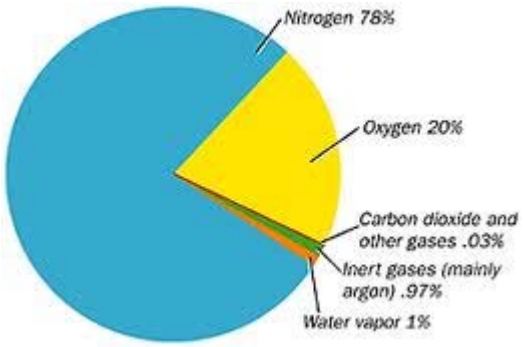
_____1.Gold
_____2.Water
_____3.Seawater
_____4.Sugar
_____5. A chocolate sundae
_____ 6. Air
_____7. Carbon dioxide
_____8. Silver
_____9. Ice
_____10.Freshly-brewed black coffee

Fun Time with mathematics and science

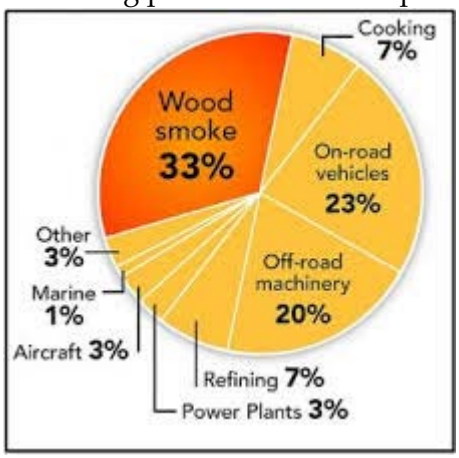
(a) Atmospheric Gases

Let's take a moment to look at what makes up the "air" in the Earth's atmosphere. The air is really a mixture of many different gases, and each gas has its own properties. The composition of air is not constant. It can vary from time to time and place to place.

Below is a pie chart with a graphical representation of dry air.



(b) The following pie chart is a self explanatory depiction of the causative agents of air pollution .



(c) **Did You Know ?????????**

There are elements in the human body…….

99% of the mass of the human body is made up of only six elements: oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus. Every organic molecule contains carbon. Since 65-90% of each body cell consists of water (by weight), it isn't surprising that oxygen and hydrogen are major components of the body. The data below shows the percentage of different elements that make up the human body.

Now, based on your understanding of a pie chart , construct a pie chart representing the composition of elements present in human body (approximate interpretation)

ELEMENTS IN THE HUMAN BODY	
Element	**Percentage**
Hydrogen	10
Oxygen	65
Carbon	18
Nitrogen	3
Calcium	2
Phosphorus	1
Other elements	1

QUESTION BANK

PHYSICS & CHEMISTRY

1. Define the following terms;
   a) Temperature
   b) Thermometer
   c) Conduction
   d) Convection
   e) Radiation

2. Match the following statements

a) Conduction	i) Insulator
b) Glass	ii) Convection currents
c) Sun's Energy	iii) Direct molecular contact
d) Sea breeze	iv) Summer
e) Light colours	v) Radiation

3. Differentiate between a clinical and a laboratory thermometer.
4. What is the normal human body temperature?
5. What precautions should be taken while reading a clinical thermometer?
6. Differentiate between conductors and insulators giving examples.
7. Why is the bottom of a cooking untensil blackened?
8. Why is the handle of a mettallic kettle covered with the strips of cane?
9. Describe an activity to show
   a) Copper is a good conductor while glass is an insulator
   b) Convection
10. What is the S.I. unit of time?
11. Name an ancient clock which is based on the change in length of shadow with the change in sun's position.
12. Which quantity is equivalent to the distance covered in a unit time?
13. Define speed. What is its S.I. unit?
14. Differentiate between uniform and non-uniform motion.
15. A train covers a distance of 560 Kill in 8 hours. Find its speed.
16. Find distance covered by an athlete in 25 seconds if he is running at a speed of 20ill/S.

17. Plot a distance-time graph for the given data.

TIME	8.00 a.m.	8.10 a.m.	8.20 a.m.	8.30 a.m.	8.40 a.m.	8.50 a.m.	9.00 a.m.
DISTANCE COVERED (km)	0	7	14	21	28	35	42

Question Bank

QUESTION BANK FOR SECOND TERM
PHYSICS/CHEMISTRY

1. Give one word answer
   a) Path of an electric current
   b) A group of cells joined together.
   c) Magnet produced by electricity.
   d) A safety device that protects appliances.

2. Match the column

1.	Electromagnet	a) Indicates current
2.	Insulator	b) Hearing effect
3.	Galvanometer	c) Magnetic effect
4.	Electric heater	d) Temporary
5.	Microphone	e) Rubber

3. Differentiate between an open and a closed circuit with the help of diagrams.

4. What is a fuse wire? What are the characteristics of the material used to make a fuse wire?

5. Describe a simple experiment to show that a wire carrying current has a magnetic field.

6. Draw a labeled diagram and explain the working of an electric bell.

7. Define the following term:
   a) Reflection
   b) Angle of incidence
   c) Angle of ret1ection

8. Give one word answer
   a) A line representing the direction of light.
   b) An image that cannot be put on screen.
   c) A piece of glass with one or both sides curved allows the light to pass through.