CLASS 7

SMART SKILLS

SYLLABUS 2016-2017

SCIENCE

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.

The **VALUE BASED QUESTIONS will** enhance the values in the children.

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
2015-16

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, Temperature, Thermometers, 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
- Conductors and insulators

Language of chemistry (chemistry)
Concepts- Introduction to Atoms, Molecules, Elements, Compounds, Mixtures. Symbols of elements, Atomicity and Valency of elements

Activities:
- Tennis ball/beads activity to demonstrate the concept of atom, molecule, element and compound.
- Laboratory demonstrations of various elements
- To show the difference in the properties of compounds and mixtures

JULY
Language of chemistry (chemistry)
Concepts- Chemical formula writing, naming a chemical compound, Word equation writing.

Activities:
- Lock and key game of chemical formula writing
- Power point presentation on chemical formula writing and naming

AUGUST
Motion and Time (physics)
Concepts – Types of motion, Speed of moving objects – slow or fast, 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 plot distance- time graphs

SEPTEMBER

Revision and Exams

OCTOBER
Physical and chemical changes (Chemistry)

Concepts-Physical changes, Chemical changes, Rusting of iron, Crystallization.

Activities:
- Various physical and chemical changes to be demonstrated
- students would demonstrate the formation of clouds and rain
- To demonstrate Rusting of iron and how to prevent it
- To demonstrate corrosion of copper
- To show the change in the color of copper sulphate solution when iron is put in the solution.
- To show the enzymatic browning of apples and potatoes in the homescience lab

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
- To show the heating effect of current
- To demonstrate the working of heating elements and coils
- 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

NOVEMBER – 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 every day 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

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

Projects

TERM I

Holiday Home Work

<u>Physics</u>

"Ashes were already falling, not as yet very thickly. I looked round: a dense black cloud was coming up behind us, spreading over the earth like a flood. 'Let us leave the road while we can still see,' I said, or we shall be knocked down and trampled underfoot in the dark by the crowd behind."- Written by 18 year old to a friend after seeing Mt. Vesuvius erupt on August 24, 79 AD.

Dear Students of Grade 7,

It could be any of us in place of this kid, who was an eye witness to a volcanic eruption. We hear about natural disasters striking Mother Earth without any obvious warnings. Giving a serious thought to natural disasters that can completely turn our lives topsyturvy ,we want you to choose any one natural disaster from the following list and work on a special project demonstrating what you have learnt, in a fun and interesting way.

- **Floods**
- **Cyclonic Storms**

PHYSICS PROJECT

Prepare a Handwritten Information booklet consisting of 8 pages(Use A-4 sheets) highlightingpagewise, the following information. The information should be very brief but relevant.

Page 1- Name of the student:

Class and section:

Name of the Natural disaster chosen by you.

Date of submission-

Page 2 - What is a natural disaster- A very brief explanation.

Page 3-What are the main causes of the natural disaster you have chosen?

Page 4- Names of a few places on earth that are vulnerable to the chosen disaster and why these places particularly vulnerable?

Page 5- What are the main effects of the natural disaster you have chosen?

Page 6- Can these disasters be predicted? And, if so how?

Page 7- Make a collage of 4 to 5 pictures related to the disaster.

Page 8- Natural disaster preparedness--- How to prepare for the chosen disaster and what to when they occur.

Evaluation criteria- This is a 10 mark project.

Timely submission- - 2marks

(Date of submission will be announced well in time before the summer holidays begin.)

Overall appeal- 2 marks

Relevance of information on each page- 4 marks

Creativity/overall appeal- 2 marks

HAPPY HOLIDAYS!

Project IInd Term

A worksheet on wind storms and cyclones after viewing a presentation in the class. Integrate the concepts you have learnt in Geography from the chapter on air.

This chapter is not tested in the term exam.
students would make Newtons disc and demonstrate how white light is made of seven colours

the project would be evaluated on the basis of the following rubric

use of correct colours(Vibgyor);neatness;formation of white light;innovation in making the disc

Formative assessment

Recapitulation exercises are conducted in every chapter to access learning of the concepts taught in class.

Formative assessment is awarded to a student on the basis of the average of the best performances of the student.

Evaluation criteria- Evaluation criteria depends on the nature of the assignment (laboratory activity/ class discussion/ application based questions/ class revision etc). However, some points are kept for timely submission of the assignment.

SYLLABUS – BIOLOGY
CLASS – VII
2016-17

April-May:-

- Nutrition in plants
- Nutrition in animals

Concepts- Mode of nutrition in plants, autotrophs and heterotrophs, photosynthesis; synthesis of plant food other than carbohydrates, other modes of nutrition in plants.

Ingestion; digestion in humans , mouth and buccal cavity, oesophagus , stomach , small intestine , absorbtion in small intestine; digestion in grass eating animals; feeding and digestion in amoeba

Activity:-

- To show location of chlorophyll in the leaf
- To prove that light is essential for photosynthesis
- Specimen of Pitcher plant - observation

JULY-AUGUST

- Nutrition in animals(cont.)
- Soil
- Waste water management (Activity based)

Concepts – Importance, study of various layers of soil; Soil profile; differences between clayey, loamy and sandy soil; sustainability of different soil types for different crops grown in India

Activity:-

- To make a model of soil profile
- To demonstrate different types of soil on the basis of water retention and absorption.
- To study percolation rate of different Types of Soil
- https://www.youtube.com/watch?v=J-JkC9xz5us

SEPTEMBER- NOVEMBER

- Respiration in organisms
- Transportation in animals and plants

Concepts: - Definition and significance of respiration; aerobic and anaerobic respiration, inhalation and exhalation, breathing rate, human respiratory system, respiratory structure in cockroach, earthworm and fish. Role of stomata and root hair.

Composition of blood, role of hemoglobin; difference between artery vein and capillaries, pulse, pulse rate, structure of human heart.

Excretory system in human beings, xylem phloem and transpiration.

Activities:-

- To determine breathing rate at rest and after exercise
- To show CO2 is released during respiration
- Model of human heart – Observation
- Model of a Stethoscope
- Demonstration Of Osmosis

DECEMBER

- Reproduction in plants
- Forests- our lifeline (Activity based)

Concepts:- Asexual and sexual reproduction, vegetative propagation, budding , spore formation, fragmentation, structure of flower, pollination, fertilization, seed dispersal- by wind, water, animals and explosion

Activities:-

- Specimens of vegetative propagation- potato, onion, ginger, *Bryophllum* and fern
- To study structure of flower
- To observe different kinds of seeds- *Calotropis*, drumstick, maple, *Xanthium*

JANUARY – FEBRUARY

- Reproduction in plants (contd.)
- Weather climate and adaptations of animals to climate (project based)
- Revision

Chapter- 1
NUTRITION IN PLANTS

NOTES

Nutrition- the process of manufacturing/taking in and utilizing food for various life processes.

TYPES OF NUTRITION
Autotrophic- In this process green plants take in inorganic substances like water, carbon dioxide, sunlight and chlorophyll and convert it to organic substances like glucose and oxygen is given out in the reaction.

1) Plants need soil and atmosphere to grow.
2) They get water and minerals from the soil in raw form-
3) They get oxygen from atmosphere.
4) They get light and temperature from sun.
5) They have a green pigment, which is in abundance in their leaves.
6) Plants collect the raw material and cook their food in the leaves.

Heterotropic - In this process non- green plants and animals depend on green plants for their food. Heterotrophic mode of nutrition can be seen in different forms

1. Parasitic mode
2. Saprophytic mode
3. Carnivorous mode
4. Symbiotic mode

Parasitic mode-- there are certain plants like cuscuta that depends on other plants for their nutrition.These parasitic plants do not have chlorophyll. They are pale yellow in colour.They have special structures that help them to extract nutrition from other plants.

In parasitic mode of nutrition the organism which derives nutrients is called a Parasite.The organism which the parasite depends is called a Host.
Parasitic plants have specialised structures called haustortia to obtain food from their host plants

Did you know????
Rafflesia(world's largest flower) is also a parasitic plant.

Saprotrophic mode

They grown on dead organic matter and obtain their food from them only, such mode of nutrition

iscalled **saprophytic nutrition** and such plants are called **saprophytes**. These plants releases enzymes outside their body , digest the organic matter and absorb them i.e. **extracellular digestion.**
Saprophytes (sapros-rotten,phyte-plants) are decomposers.Dead organisms breakdown
Complex organic matter for their use.In exchange they release vital chemicals into the soil.These are absorbed and used by autotrophs.We can say that saprotrophshelp reuse and recycle the organic material.

Carnivorous plants:
In some areas soil is deficient in certain nutrients, especially nitrogen. Hence plants growing in such areas need to obtain same from other sources
Carnivorous plants are those plants that derive some of its nutrients by trapping and consuming animals, mainly insects. Therefore such plants are called **insectivorous plants**.
Some common examples are the pitcher plant, Drosera(sundew), bladderwort, and the venus fly trap.
Plants requirement for nitrogen is supplied by the digested insects.Unlike parasitic plants like cuscuta,the pitcher plant has chlorophyll.

Symbiotic plants:
Some symbiotic plants demonstrate a win-win kind of interdependence. The most beautiful aspect is that this interdependence can be between a plant and bacteria or plant and fungus.
Symbiotic relationship is a close association between individuals of different species. The relationship is based on the nutritional benefits they derive from each other.
For Example-Rhizobium and Legume plants
A gram and pea plants are common examples of legumes. Legumes growing in soil develop modules in their roots which harbor bacteria called Rhizobium. The bacterium has the ability to convert nitrogen from the air to an absorbable form. While the bacteria provide usable nitrogen for the plant, in return it gets appropriate condition for its survival in the root nodule.
The most well known example of a symbiosis is that of fungi and algae is the **lichen**. The fungus component of the lichen is referred to as the **mycobiont** and the algal component is called phycobiont. The algal partner makes food and provides it to fungi and in return fungi provides water, minerals and shelter to alga.

Assignment- 1.1

Fill in the blanks:

1. The components of food that are necessary for our body are called _____.
2. The components of food include _____, _____, _____, _____ and _____.
3. _____ and _____ are directly or indirectly dependent on plants.
4. _____are the only organisms that can prepare their own food using _____, _____, _____, and _____.
5. _____ is the mode of taking food by an organism and its utilization by the body.
6. The green pigment in leaves is called _____.
7. _____ which is essential for the survival of all organisms is produced during photosynthesis.
8. During photosynthesis plants synthesize _____, which ultimately gets converted into _____.
9. Slimy, green patches in ponds and other stagnant water bodies are due to the growth of organisms called _____.
10. Carbohydrates are made of _____, _____ and _____.
11. _____ are nitrogenous substances that contain nitrogen.
12. Soil has certain _____ that convert gaseous nitrogen into usable form and release it into the soil.
13. Cuscuta (Amerbel) uses _____ mode of nutrition.
14. The Pitcher plant eats _____ and is hence a _____ plant.
15. _____ are organisms that have no chlorophyll and no mouth like animals and feed on dead and decaying organic matter.
16. Some organisms live together and share shelter and nutrition. This is called _____relationship.

17. The organism Lichen has a symbiotic relationship between an _____ and a _____

18. _____ and _____ are essential requirements for photosynthesis.

19. _____ energy is stored in the form of food in the leaves with the help of chlorophyll.

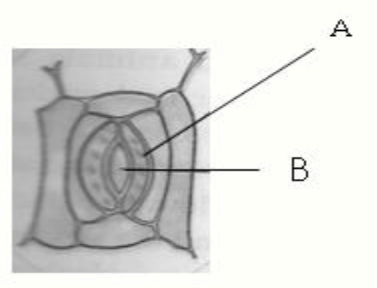
20. During photosynthesis plants take in _____ and release _____ into the air.

Answer the following:

1. Where do plants synthesize their food?
2. Why are algae green in colour? Where do they grow?
3. What are the various components of food?
4. Why do organisms need to take food?
5. Name the pores through which leaves exchange gases.
6. How does the following raw material reach the leaves of a plant for preparing food:
   a. Water and minerals
   b. Carbon-dioxide:
7. Explain photosynthesis in brief. Give an equation to represent the process.
8. If two similar potted plants A & B are taken such that:
   Plant A is kept in the dark or a black box for 72 hours (3 days),
   Plant B is kept in sunlight.
   Iodine test is conducted with the leaves of both plants.
   Which plant leaf tests positive for the test and Why?
9. Why is the sun considered as the ultimate source of energy for all things?
10. Define the following and give one example of each:

a. Autotrophic nutrition
b. Heterotrophs

11. Label the following diagram of stomata:



12. Give the mode of nutrition for the following:

a. Amerbel b. Rose c. Pitcher plant d. Deer e. Cow

f. Mushroom g. Pig h .Cabbage i. Yeast j. Man

MULTIPLE CHOICE QUESTIONS:

1. Plants take carbon dioxide from air during photosynthesis from
   a. root hair b. leaves c. water d. flowers

2. Presence of starch can be tested by
   a. alcohol b. iodine c. water d. hydrochloric acid

3. Which part of plant gets CO_2 from air during photosynthesis
   a. root hair b. sepal c. stomata d. leaf vein

4. Green plants are also known as
   a. autotrophs b. heterotrophs c. carnivores d. saprophytes

5. The green pigment in leaves help to
   a. make food b. absorb water c. absorb sunlight d. take in CO_2

6. In a cactus plant, the part responsible for photosynthesis is
   a. leaf b. thorn c. root d. stem

7. Which of these products is not stored as food in plants
   a. protein b. vitamins c. oxalic acid d. oil

8. The simplest carbohydrate made as food during photosynthesis is
   a. starch b. sugar c. glucose d. oil

9. Cuscuta plant can be categorized as
   a. parasite b. insectivorous c. saprophyte d. host

10. The plant that traps and feeds on insects
   a. cuscuta b. china rose c. rose d. pitcher plant

11. The leather objects that are kept in hot humid weather for a long time are spoiled due to the growth of
    a. algae b. yeast c. fungi d. moss

12. The Rhizobium bacteria lives inside the root nodules of
    a. peas b. beans c. peanuts d. all of the above

VALUE BASED QUESTION:

Reena segregates the waste at home and put the bio degradable waste in a pot containing soil. She leaves it for 15 days and uses that soil for her plants in the garden. Why do you think she did so?

Lab activity

Objective: To test a leaf for presence of starch.

Materials required: Green leaves, Beaker, tripod stand, burner, test tube, alcohol, iodine solution, petridish, water.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

Chapter 2
NUTRITION IN ANIMALS

NOTES

NUTRITION IN HUMANS

- The alimentary canal and the associated glands together constitute the digestive system.
- Food is taken into the mouth through the mouth. This process of taking food into the body is called ingestion.

What happens to the food in different parts of the digestive tract?

The mouth :
Our mouth has the salivary glands which secrete saliva. The saliva breaks down the starch into sugars.

Oesophagus –

- It is a long, narrow, muscular tube which directly leads to the stomach.
- It is about 25 cm long and passes downwards through the neck, the thorax and the abdominal cavity.
- Oesophagus gently pushes masticated food down to the stomach in a wave - like action, called peristalsis.

The stomach:

- The inner lining of the stomach secretes mucous, hydrochloric acid and
- digestive juices.
- The mucous protects the lining of the stomach by neutralizing acid produced by gastric juice.

- The hydrochloric acid kills many bacteria that enter along with the food and makes the medium in the stomach acidic.

- The digestive juices break down the proteins into simpler substances

The small intestine:

- The small intestine is highly coiled and is about 7.5 meters long.

- Liver (reddish brown) is the largest gland in the body.

- It secretes bile juice that is stored in a sac called the gall bladder. It digests fats.

- The pancreas is cream colored gland secretes pancreatic juice that acts on carbohydrates and proteins and changes them into simpler forms.

- The carbohydrates get broken into simple sugars such as glucose, fats into fatty acids and glycerol, and proteins into amino acids

- The digested food can now pass into the blood vessels in the wall of the intestine having
- thousands of finger-like villi .

- The surface of the villi absorbs the digested food materials. The absorbed substances are transported via the blood vessels to different organs of the body

- Large intestine: The food that remains undigested and unabsorbed then enters into the large intestine.
- It is about 1.5 meter in length.

- Its function is to absorb water and some salts from the undigested food material.

DIGESTION IN RUMINANTS

Rumination:
A process in which partially digested food returns to the mouth in small lumps and the animal chews it. This type of process is called Rumination and such types of animals are called Ruminants.

How does digestion occur in Ruminants grass-eating animals?

- Ruminants quickly swallow the grass and store it in a separate part of the stomach called rumen. Here the food gets partially digested and is called cud.

- Later the cud returns to the mouth in small lumps and the animal chews it. This process is called rumination.

- The cellulose present in grass is digested here by the action of certain bacteria which are not present in humans.

DIGESTION IN *AMOEBA:*

Amoeba is a single-celled organism found in pond water. It has a cell membrane, a dense, rounded nucleus and many bubble-like vacuoles. Amoeba constantly changes its shape and position. It pushes out one or more finger like projections, called pseudopodia or false feet for movement and capturing of food. *Amoeba* feeds on microscopic organisms. When it senses food, it pushes out pseudopodia around the food particle and engulfs it. The food becomes trapped in a food vacuole and digested by the digestive juices.

Chapter 2
NUTRITION IN ANIMALS
Assignment 2.1

1. Fill in the blanks:

a. _____ is the process of elimination of undigested material from the body.

b. _____, Liver and _____ are the glands associated with the digestive system.

c. Digestion begins in the _____ and ends in the _____ intestine.

d. Food pipe or _____ connects mouth to stomach.

e. _____ help in movement and _____ in *Amoeba*.

2. Complete the table given below:

ACTION OF JUICE	GLAND	LOCATION	JUICE
			Saliva Bile Pancreatic juice

3. Match the correct pairs:

COLUMN A	**COLUMN B**
a) Premolars	i) Cutting and Biting Teeth
b) Incisors	ii) U- shaped organ
c) Small intestine	iii) Pseudopodia
d) Canines	iv) Reabsorbs water from undigested food
e) False feet	v) Piercing and tearing teeth

f) Stomach vi) Chewing and Grinding teeth

g) Large intestine vii) 7.5m long

4. Name the largest gland of the human body.

5. Give the function(s) of the following:

a) Rectum
b) Caecum in ruminants
c) Pseudopodia
d) Large intestine
e) Gall Bladder

6. Give any two functions of our tongue besides talking.

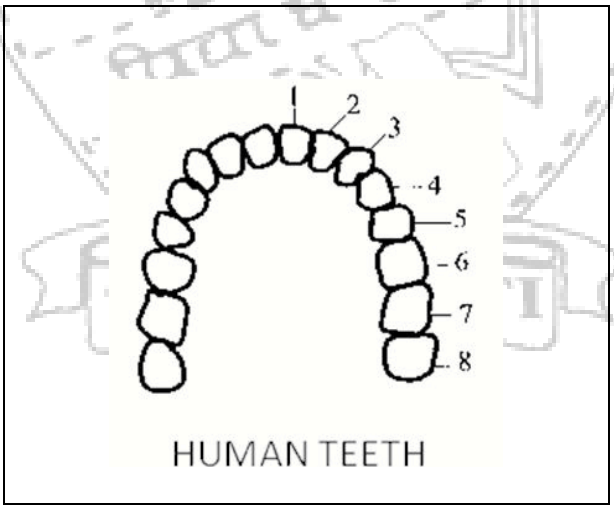
7. What would happen if there are no villi in the walls of small intestine?

8. Differentiate between ingestion and egestion.

9. If a piece of chapatti is chewed for sometime without swallowing it tastes sweet. Why?

10. Give reasons, why cows are able to digest cellulose and not humans?

11. In the figure of human teeth given below, what do the given numbers indicate?



VALUE BASED QUESTIONS:

Tina brought home a stray puppy. She fed it before contacting the blue cross society to hand it over to them. Why do you think she did so? If you were in her place what would you do?

Lab activity

Objective: To test the activity of salivary amylase on starch.

Materials required: enzyme salivary amylase, starch solution, test tubes, iodine solution, dropper.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

CHAPTER 3

Fibre to Fabric

This chapter is covered in class VI and then again in class VIII and is therefore done only by showing presentations in the class.

The presentations will be followed by a chrome book activity in class.

This chapter would not be evaluated in the exam.

CHAPTER 4

HEAT
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 = 4.182 Joules =4.2 Joules (approx)

1cal = 4.2 J

Temperature

- It is the degree of hotness or coldness 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.
- or, it is the property of a body or region of space determining the rate at which heat will be transferred to or from it.
- 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 C to 42 C • It has a kink • It is used to measure human body temperature	• the range is -10 C to 110 C • It does not have a kink • It is used to measure temperature of substances in laboratories

Numericals:

1cal = 4.186 or 4.2 J; K = °C + 273; °F = 9/5 °C+32

Convert:

a. 5 cal to Joules
b. 4.2 cal to Joules
i. 45 °C to K
j. Boiling point of water (°C) to K

c. 41.86 J to cal
d. 29.4 J to cal
e. 0.5 cal to J
f. 10 cal to J
g. 2.1 J to cal
h. 8.372 J to cal
- (Least count to be discussed)

k. Freezing point of water (°C) to °F
l. 30 °C to °F
m. -40 °F to °C
n. 90 °C to °F

Transfer of heat

a. Conduction - 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.

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

When a body cools by radiation, the rate of cooling depends on:

- temperature of radiating body
- temperature of surroundings
- mass of radiating body
- area of radiating body
- nature of radiating body
- specific heat of radiating body

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 painted black
- shiny, polished reflectors are used in electric heaters
- construction of a thermos flask
- fire fighters wear shining suits and helmets

Activity 1

Aim – To compare the conductivity of different substances.

Materials Required –

Theory –

Diagram

Procedure

Observation

1. The _____
2. The _____
3. The _____
4. The _____
5. The _____

Conclusion

_____

_____

CHAPTER 4

HEAT

Activity 3

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

Materials Required –

Theory -

Diagram

Procedure

Observation

Conclusion

CHAPTER 4

HEAT

Activity 4

Aim – To show convection

Materials Required –

Theory –

Diagram

Procedure

Observation

Conclusion

CHAPTER 4

HEAT

Activity 5

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

Materials Required –

Theory –

Diagram

Procedure

Observation

Conclusion

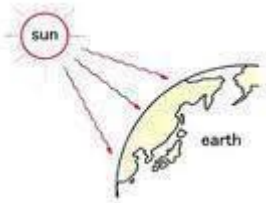
Precaution

CHAPTER 4

HEAT

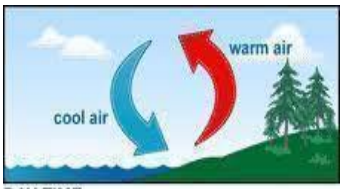
Assignment 4.1

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

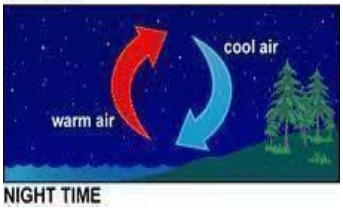


(a) From the sun to earth _____

(b) From the flame to the vessel _____

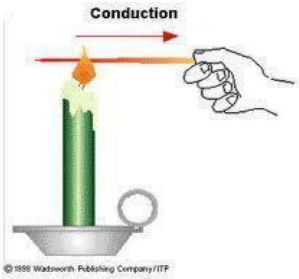


DAY TIME

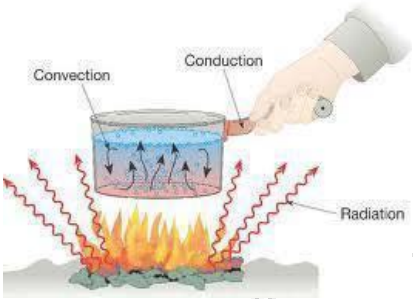


NIGHT TIME

(c) Movement of air - _____



(d) From the flame to the metal rod _____



(e) From the flame to vessel - _____

From the vessel to water - _____

From the vessel to its handle - _____

From the fire to the sides - _____

2. In which direction does heat flow occurs 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

4. 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

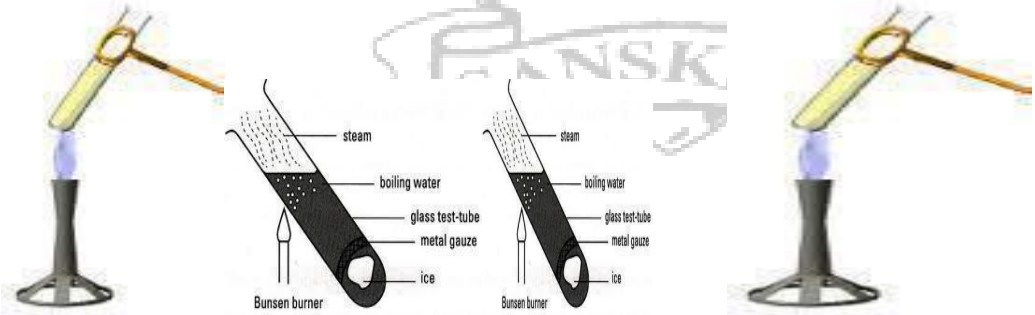
5. Sea breeze is caused due to

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

6. 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

7. 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

8. 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

Numericalsfor Self Practice.

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

1cal = 4.18 J = 4.2 J

Conversion formula between ^oC, ^oF and K

K = C + 273

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

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

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. 227 ^{o}C into ^{o}F
10. -40 ^{o}F into ^{o}C

9. 10 cal into J
10. 42 J into cal

CHAPTER 4

HEAT

Assignment 4.5

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.

CHAPTER 4

HEAT

Question bank(for self assessment during recapitulation)

1. Name the device used to measure temperature.
2. Which thermometer measures our body temperature?
3. What is the range of clinical thermometer in degree Celsius and degree Fahrenheit?
4. What is the use of kink in a clinical thermometer?
5. Name two things other than solids which are poor conductors of heat.
6. Name the mode of transfer of heat which does not require any medium.
7. What is the difference between dark and light surfaces (in terms of heat)?
8. Name the two units of heat. Which one is the SI unit of heat?
9. Name the three units of temperature? Which one is the SI unit of temperature?
10. What is the relation between joule and calorie?

Fill in the blanks with appropriate word:-

1. The process by which heat is transferred from hotter end to colder end of an object is known as _____.
2. Materials which allow heat to pass through them easily are called _____ of heat.
3. Materials which do not allow heat to pass through them easily are called _____ of heat.
4. When heat falls on an object, a part of it is _____, a part is _____ and a part may be _____.
5. The temperature of an object increases due to _____ part of the heat.
6. A dull black surface _____ and _____ heat.

7. _____, _____ and _____ surfaces are good reflectors of heat.

8. A good reflector of heat is a _____ absorber and _____ radiator of heat.

Answer the following questions:-

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.

Give reasons for the following:-
[Write the scientific concept and then explain]

a) We feel warm if we wear woolen clothes in winter.

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

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

d) A hot air balloon rises up.

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

f) Deserts are very hot during day and cold at night.

g) Double walled containers are used to make ice boxes.

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 labeled 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.

CHAPTER 5

Acids, bases and salts

Smart Notes

Substances may be classified as-
- Acid
- Bases
- Salts

Acids-
- Taste sour
- Contain replaceable hydrogen radical
- 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

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
- 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 an oxide. The oxide when dissolved in water forms an acid.

Formation of a base-
A metal reacts with oxygen to form a basic oxide. This oxide when dissolved in water forms a base.

Bases which dissolve in water are called alkali. All 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 color 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.

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

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) Saliva 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. Differentiate between an organic and a mineral acid.

Q6. Write an activity to show that-
Non metal oxides are acidic in nature.
Water is a neutral substance

Q7. 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.

Q8. 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- _____

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?

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-_____.

Q4. Ammonia is found in many household products, such as window cleaners. It turns red litmus blue. What is its nature?

_____

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:

Sl. No.	Indicator Type	Acid (dilHCl)	Base (NaOH)
01.	Blue Litmus Solution		
02.	Red Litmus Solution		
03.	Methyl Orange		
04.	Phenophthalein		

Results:

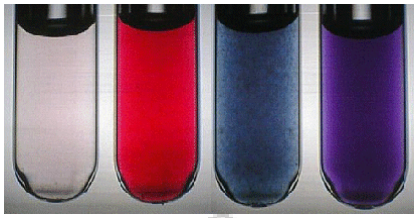
Precautions:
As both acids and bases can cause damage to skin and they are corrosive, a lot of care should be exercised while putting them in the test tubes.

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.

Let us do

Making pH Indicators



Introduction:

A **pH indicator** is a chemical compound that is added in small amounts to a solution so that the **pH (acidity or alkalinity)** of the solution can be determined easily. pH indicators are usually **weak acids or bases** themselves. They detect the presence of **hydronium ions (H_3O^+) or hydrogen ions (H^+).**

A procedure known as titration can be used to determine the presence of an acid or base. Titration uses the reaction between an acid and a base known as neutralization to determine the pH.
A strong acid reacts with a strong base to form a neutral (pH=7) solution.
A strong acid reacts with a weak base to form an acidic (pH<7) solution.
A weak acid reacts with a strong base to form a basic (pH>7) solution.

Objective:

Students will create various pH indicators that can be used to test unknown solutions to determine if they are an acid or a base.

Materials per Group:
Knife to slice veggies
Measuring cup
Hot plate
Pan
Two dropper bottles
Electronic balance
Distilled water
Rubbing alcohol
Red cabbage
Fresh beet
Laxative containing phenolphthalein
Tumeric (dried spice)

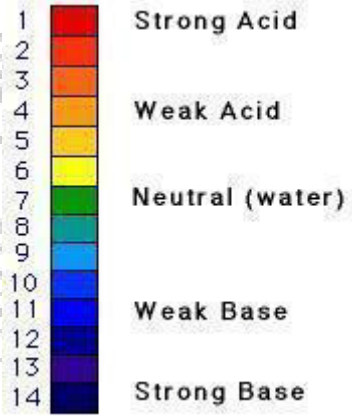
Coffee filters
Bowl
Cookie sheet
Scissors
Ziplock bags
Measuring spoons
Ammonia (unknown A)
Vinegar (unknown B)
Marking pencil
pH indicator chart
4 small, clear plastic cups

Prelab:

Review safety procedures such as using caution when working with acidic and basic solutions since they can irritate the skin. Goggles and aprons must be worn throughout the experiment. All solutions can be washed down the drain with plenty of water.

Also review the pH scale. The scale goes from 0 to 14 with a pH of 7 being neutral. A pH from 0 up to 7 is acidic with 0 being the strongest acids. A pH above 7 to 14 would be basic or alkaline with 14 being the strongest base.

pH Indicator Chart

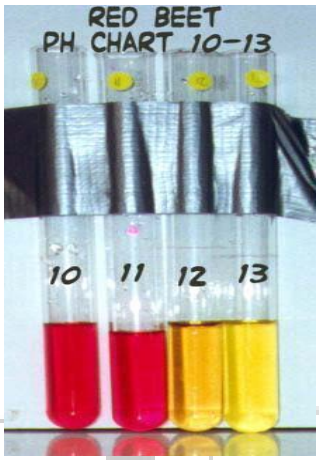


Procedure (Part A) – Making Natural Indicators:

Beet Juice Indicator Solution #1

Wash and slice a fresh beet. Place about four slices of beet into a pan containing one cup of water. Heat until boiling and continue boiling for about five minutes. Remove the beet slices and allow the red liquid to cool. Store juice in dropper bottles.***Beet juice is red in acidic solutions and***

blue in basic solutions. Beets contain a pigment known as **anthocyanin** that will change from red to yellow somewhere between pH 11 and 12.



Phenolphthalein Indicator Solution #2

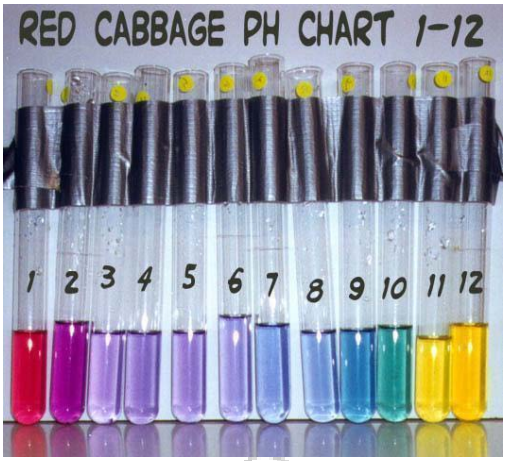
Purchase any laxative that contains phenolphthalein. With the back of a spoon, mash four to six tablets in a saucer. Pour the powder into a small cup. Add about ten milliliters of rubbing alcohol. Let this mixture stand for fifteen minutes. Pour off the liquid and store in a dropper bottle. ***Phenolphthalein is purple in very basic solutions and colorless in acidic solutions.***

Turmeric Indicator Solution #3

Obtain a package of turmeric form the spice section of the grocery store. Add $^1/_4$ teaspoon of turmeric to four tablespoons of rubbing alcohol. Stir to mix. Store in dropper bottle.***Turmeric solution stays yellow in the presence of acids and changes to purple-brown in the presence of bases.*** Turmeric solution can also be made into indicator paper (see Cabbage Paper). ***Dry turmeric paper is bright yellow and changes to red in the presence of bases.***

Red Cabbage Indicator #4

Tear five leaves of red cabbage into small pieces. Place the cabbage pieces in a small pan. Add four cups of hot water. Let the leaves soak for about half an hour until the water is a deep purple and cooled to room temperature. Strain the liquid into a storage bottle. Cover and store in the refrigerator. ***Red cabbage juice indicator is red in acid solutions, purple in neutral solutions, and greenish-yellow in basic solutions.*** Red cabbage contains a pigment molecule called **flavin (an anthocyanin).** This water-soluble pigment is also found in apple skin, plums, poppies, cornflowers, and grapes. Red cabbage juice will function over a wide pH range, from as low as pH 1 up to pH 12.



Cabbage Indicator Paper (optional)

Pour one cup of cabbage indicator (above) into a bowl. Dip one or two coffee filters into the indicator. Place the wet filter paper on a cookie sheet or flat pan. Continue to soak the paper until saturated. Allow the paper to dry (this will take more time than your class time, so use it the next day or for another activity). The paper will be pale blue. Cut the dry papers into strips about 1.25 by 7.5 centimeters (0.5 by 3 inches). Store the strips in a zip-lock plastic bag. ***Cabbage paper turns green in the presence of bases and pink to red in the presence of acids.*****NOTE**: Beetroot indicator paper can be made in the same way.

Procedure (Part B) – Testing the Natural Indicators:

Label two dropper bottles with UNKNOWN A on one and UNKNOWN B on the other.

Fill each labeled dropper bottle with the correct unknown. These solutions will be used to test the indicators you made.

Obtain 8 small, clear plastic cups. Label these **1A -4A** and **1B – 4B** for the indicator solutions you made.

Correctly place a small amount of each indicator in the bottom of each labeled cup using the following table as a guide.

1A	2A	3A	4A	1B	2B	3B	4B
Beet juice	phenolphthalein	Tumeric solution	Cabbage juice	Beet juice	phenolphthalein	Tumeric solution	Cabbage juice

Record the name of the indicator and its initial color on the data table.
Add **one drop at a time** of UNKNOWN A to the indicator in **cup 1A**. **Record** the unknown being used on the data table --- A or B.

Stir with a toothpick or carefully swirl the cup after each drop.
Continue **adding one drop at a time** followed by stirring until the color changes from the original color.

Discard the toothpick and use a new toothpick for each indicator solution.

Record the color change (final color) in the data table.

Repeat steps 5 - 10 with each of the **other indicators 2A – 4A**.

Using the color change information found in the recipe for the indicator, place a check mark in the **Acid OR Base** column on the data table for each of the color changes you found.

Repeat steps 6 – 11 with cups 1B – 4B using UNKNOWN B.

Data and Results:

INDICATING ACIDS & BASES						
Cup #	Unknown # A or B?	Indicator Solution	Initial Color	Final Color	Acid?	Base?
1						
2						
3						
4						
5						
6						
7						
8						

Questions:

1. When an acid and base combined what reaction results?
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 _____.
7. Phenolphthalein indicator solution will turn what color in the presence of bases?
8. Phenolphthalein indicator solution will turn what color in the presence of acids?
9. Turmeric indicator solution stays yellow in the presence of acids and turns what color in the presence of bases?

Extra bit!

How elements can becomeCorrosive

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**?

_____

What does the symbol mean? _____

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

_____

_____

(d) How is highly alkaline nature corrosive?

_____

_____

hots

1.the use of diesel vehicles causes a lot of SO2 gas emissions. on a rainy day,due to heavy traffic jams on the city roads , the emissions were hiher than normal. the emissions dissolved in the rain, causing acid rains.

what would be the nature of SO2 gas?

2. near a factory,the river was found having dead aquatic life. what could be the reason for this. why do you think so?

3.if a drain is clogged at home, what home remedy would you use to unclog it?

4. name the acid that can even attack glass.

5. what is the chemical nature of healthy blood?

6. name the chemical names for caustic soda and caustic potash

7. when a few drops of coke were put in methyl orange. it turned pink in color.what conclusions can you make from this observation.

CHAPTER 6

PHYSICAL AND CHEMICAL CHANGES

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.	1. It is a change in which a substance undergoes a change in which one or more new substances are formed.
2. It is generally reversible.	2. It is generally irreversible and permanent.
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.

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 color
(e) Formation of gas

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

S No	Change	Physical/Chemical
1	Tearing of paper	
2	Burning of paper	
3	Melting of wax	

4	Burning of wax	
5	Formation of curd from milk	
6	Melting of ice	
7	Boiling of water	
8	Heating of an iron nail	
9	Rusting of iron	
10	Burning of magnesium ribbon	
11	Photosynthesis	
12	Dissolving salt in water	
13	Burning of coal	
14	Crushing of a chalk	
15	Digestion of food	
16	Cutting a log of wood	
17	Keeping iron filling in $CuSO_4$ solution	
18	Formation of manure from leaves	
19	Stretching of a rubber band	
20	Bursting of cracker	
21	Crystallisation of $CuSO_4$ solution	
22	Adding a pinch of baking soda to vinegar	
23	Passing carbon dioxide through lime water	
24	Souring of milk	
25	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.
Conditions required for rusting to take place:-

Presence of _____

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.

Q.2. 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.3. Write word equations for the following chemical changes-

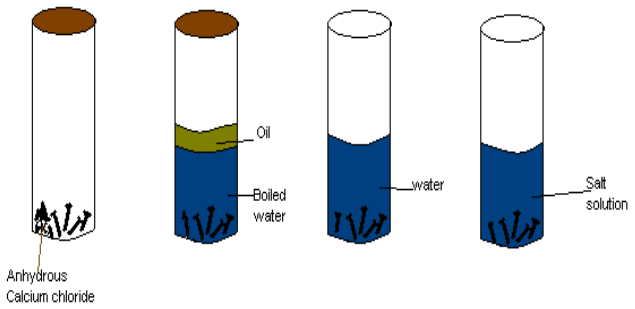
a) The oxide of magnesium is dissolved in water to form magnesium hydroxide
b) Baking soda is added to an aerated drink to form bubbles of carbon dioxide and other substances
c) Carbon dioxide is exhaled in lime water to form carbonic acid.
d) Zinc granules are added to hydrochloric acid to form zinc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

Q.4 Which of the following change is useful?

a) Burning of paper b) Rusting
c) Formation of curd d) Cutting of trees

Q.5 Define the following terms:-
a. Crystallisation b. Galvanisation c. Rusting

Q.6 Study the diagram and answer the questions:-



In which case, would iron nails get rusted fastest and why?
In which case, would iron nails not get rusted and why?

Q.9 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.

Let us do

Magic with Chemistry

Secret message- On a blank paper, write a secret message to your friend with lemon juice.
How does your friend read the message? Hold the paper above a lighted candle. The message will appear by itself.

Magical drink- Take some soap solution in a container. Dip a clean handkerchief into the container. (Dip it into turmeric and dry beforehand. Lo and behold. Your handkerchief will turn red.

Greeting card
You can design your own t- shirt or make a personalized greeting card with a difference for your friend.
Apply a paste of turmeric on a piece of paper and let it dry completely. Now dip a brush in soap solution and paint a free hand drawing on the paper.

Chapter 7

WEATHER, CLIMATE AND ADAPTATION OF ANIMALS TO CLIMATE

Subtopics

Climate and Adaptation- This Topic will be done as Project.

Chapter 9

SOIL

NOTES

The word soil is derived from a Latin word solum meaning ground. It is a stratified mixture of inorganic and organic materials, both of which are products of decomposition.

Inorganic component of soil i.e. mineral constituents are derived from the soil forming rocks, by fragmentation or weathering. Weathering of rocks takes place by two methods:

- Physical weathering - It is due to the action of rain, wind and temperature.
- Biological weathering of rocks - This is due to growth of lichens and mosses on the rocks. The organic component of the soil is formed either by microbial decomposition of dead remains of plants (litter) or animals, or through metabolic activities of living organism present in the soil. Thus the formation of soil takes place by interaction between the physical and biological components.

Soil can be defined as the uppermostcrust of earth, which is mixed with organic material and in which animals, and microorganisms live and plants grow.

Components of soil

- Inorganic material derived from parent (material) rocks
- Organic material derived from dead and decayed materials
- Biological system - such as bacteria, fungi, algae, protozoa and other soil animals such as nematodes, earthworms etc.

The air and water occupying the pores between the soil particles, which are loosly packed

Soil and food production

- Loamy soil has about 30-50% silt and 20% less than clay particles.
- Sand contains rock particles with diameter in range 0.125-2.0mm.
- Clay has soil particles whose size is less than 2-4 mm in diameter.
- Silt soil is composed of particles whose diameter ranges from 1/256-1/16mm.

Soil Profile:

A soil consists of three horizontal layers. They are true soil at the top, sub soil and bedrock. Each horizon is different from other by its own physical and chemi-cal composition and organic contents produced dur-ing the process of soil formation.

Soil Texture:

Soil is the medium for plant growth, it provides anchorage to plants.

- Soil provides nutrients, both major and minor, to plants for their growth and development. Thus, it circulates the nutrients into biological system by means of mineral weathering.
- Soil harbors the microorganisms such as bacteria and fungi, which fix the free atmospheric nitrogen into soil (nitrogen fixation) and at the same time, some of the fungi also fix phosphorus (mycorrahage).

Soil texture refers to the mixture of different soil particles grading from coarse into fine grades of gravel, sand, silt and clay. Soils with a large proportion of sand grains are called Sandy Soils. Clayey Soils have a large proportion of clay particles and a little of sand, and soils, with fairly equal proportions of sand, silt and clay are called loams.

Fertile Soil

Fertility of the soil is nothing but ability to nourish the plant life with required nutrients. The fertility of soil decreases when crop is grown in the same land repeatedly. Another cause of reduction of fertility of soil is soil erosion. Soil erosion refers to physical removal of soil particles from their original place and transportation to some other places. Soil fertility can be prolonged both by the human efforts (application of manures, bio-fertilizers, chemical fertilizers to soil of crop fields etc.) and natural processes.

Soil Formation:

Soil is a stratified mixture of organic and inorganic materials and both are decomposed products. The organic matter are derived from plant and animal life as well as moisture and air, while the inorganic matter is supplemented by parent rocks, topography and time which are considered as passive agents. The factors supplementing organic matter are called ac-tive agents.

Chapter 9

SOIL

1. Fill in the blanks:

a) _____ is the process of breakdown of rocks by the action of wind, water and climate.

b) Dead plant and animal remains are decomposed to form _____.

c) _____ Soil has the right water holding capacity for the growth of the plants.

d) Clayey soil is suitable for growing _____ and _____.

e) _____ Soil is used for making pots, toys and statues.

2. Compare and contrast sandy and clayey soils on the basis of given criteria.

S.NO.	FEATURE	SANDY SOIL	CLAYEY SOIL
a.	Composition		
b.	Size of particles		
c.	Air spaces (large/small)		
d.	Porosity (high /low)		
e.	Water absorption tendency		
f.	Water holding ability		

3. Name the layer of soil which is rich in minerals and has compactly packed fine particles.
4. Topsoil also provides shelter to many organisms. Name them.
5. Give one characteristic features of C-Horizon and bedrock respectively.
6. Define Soil. How is soil classified? What is the criterion of this classification?
7. Why is top soil or A-Horizon dark in colour?
8. There are two soil samples A and B. It takes 10 min for 200 ml of water to flow through sample A and 5 min for the same amount of water to flow through sample B. Which of the given two samples will let water pass through more quickly? Justify.
   (**Hint**: Calculate percolation rate of each sample)
9. Which type of soil is ideal for growing pulses? What is its composition? Give any two important features of this type of soil.
10. Draw a neat and well-labelled diagram of soil profile.

VALUE BASED QUESTION:

Arun prefers to drink water cooled by the refrigerator, but he fills the earthen pot in his house with fresh water as his grandparents love to drink water from an earthen pot.

LAB ACTIVITY 1

Objective: To study the profile of the soil.

Materials required: Glass jar, soil and water.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

LAB ACTIVITY 2

Objective: To investigate the absorption of water in different types of soil.

Materials required: 3 glass jars, 3 funnels, water, 3 different kinds of soil (loam, sand, clay), filter paper, weighing machine.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

CHAPTER 10

RESPIRATION IN ORGANISMS

The cells of living organisms require a constant supply of oxygen to release energy. The energy released is used to carry out cellular processes.

HUMAN RESPIRATORY SYSTEM:

Breathing

It is the process by which organism takes in oxygen continuously and releases carbon dioxide into the environment.

- Breathing is a part of respiration and it is also referred to as external respiration.
- Breathing merely involves exchange of gases between the organism and the environment.
- Breathing is purely a physical process.
- Breathing is brought about by coordination between lungs, ribs and the diaphragm. Diaphragm is a thin sheet of skeletal muscle that separates the thoraciccavity from the abdominal cavity.
- It is a mechanical process that involves two steps – inhalation and exhalation.

a) Inhalation is the action of taking in air rich in oxygen. During inhalation, the rib cage moves outwards and the diaphragm contracts to move downwards. As the rib cage expands, the space in the chest cavity increases allowing air rich in oxygen enter the lungs.

b) Exhalation is the action of giving out air rich in carbon dioxide to the environment. During exhalation, the ribs move inwards and the diaphragm relaxes to return to its normal position. The contraction of rib cage reduces the size of the chest cavity. Now air rich in carbon dioxide is driven out of the lungs.

RESPIRATION	BREATHING
Respiration involves both physical and chemical processes.	Breathing is purely physical process.
Respiration involves oxidation of food to release energy.	Breathing is the action of taking in oxygen and giving out carbon dioxide.
Respiration is the sum of external and internal respiration.	Breathing is the sum of inhalation and exhalation.
Respiration releases energy.	Breathing does not release any energy.
Respiration takes place in all the cells of the body.	Breathing takes place only in the organs involved in the process.
Respiration involves breathing and	Breathing is a part of respiration.

oxidation of food inside the cell.	

Breath and breathing rate

- One complete breath accounts for the sum of one inhalation and one exhalation.
- Breathing rate is the number of times a person breathes in one minute. Normal breathing rate in an individual during rest is 15 – 18 breaths per minute. Breathing rate increases drastically during exercise and running.

Respiratory system in human beings

Different organs of respiratory system include nostrils, larynx, trachea, bronchi, a pair of lungs, bronchioles and alveoli.

Mechanism of breathing

a) During inhalation, nostrils take in the air which is moistened by the mucous secreted by the inner lining of the nose.

- The mucous lining present in the respiratory tract keeps the passage moist from the nasal cavity to the lungs.
- Mucous and the hair in the nose entangle the dirt, pollen and other dust particles and prevent them from entering our nose.

b) Air passes through the pharnyx and enter the trachea made up of rings of cartilage. Trachea is also called as wind pipe.

c)Trachea bifurcates into two stems called as bronchi (singular: bronchus).

d) Lungs are situated inside the chest cavity and they rest on a large muscular sheet called the diaphragm.

- Diaphragm forms the floor of the chest cavity. When you breathe in, your diaphragm and rib cage get into action.
- The diaphragm is protected by the rib cage.
- The diaphragm plays an important role in inhalation and exhalation. Movement of diaphragm is brought about by special musculature.

e) Each bronchus enters the lung on either side and gives out repeated branches named as bronchioles inside the lung.

f) Bronchioles supply individual cells of the lung named as alveoli (singular: alveolus). Each lung is made up of 300 million alveoli.

- A group of alveolar cells are surrounded by blood vessels.
- Oxygen that enters the lungs is exchanged with carbon dioxide from the tissues at this alveolar region.
- Carbon dioxide is taken out in the same path through which oxygen entered inside.

g) Carbon dioxide is released through nostrils by the process of exhalation.

h) During exercise, breathing rate increases so as to obtain more amount of oxygen which in turn oxidizes more food to release more energy required.

Respiration in earthworms

Earthworms exhibit cutaneous respiration i.e. respiration by skin.

- Earthworms do not possess special organs for respiration.
- They always secrete slimy secretion on to the skin which keeps it moist.
- The skin in these animals is moist and slimy which makes it permeable for oxygen to diffuse in and carbon dioxide to diffuse out of the body.
- As the earthworms cannot breathe in waterlogged conditions, they come out on to the soil during rainy season to obtain oxygen required for respiration.

Respiration in insects

an insect body is covered with air holes called as spiracles.

- Air enters through these air holes on the body and finally reaches the trachea.
- Trachea are a network of fine air tubes extending throughout the body.
- Trachea help in circulating the oxygen throughout the body.
- The oxygen in the air diffuses into the tissues and is ultimately absorbed by the cells.
- The carbon dioxide released by the cells is carried by the trachea and given out through the spiracles.

Respiration in fishes

Fish are the aquatic vertebrates which respire through structures called as gills. This is called as branchial respiration.

- Gills are present on either side of the head and are supplied by rich blood vessels.
- Fish obtain oxygen dissolved in water.
- During respiration, water enters the body through mouth, passes through gills and comes out of the operculum.
- Exchange of gases takes place in the gills of fish supplied by numerous blood vessels.
- They accept oxygen into the body and expel out carbon dioxide.

Respiration in frogs

Frog is an amphibian having two lives, one in water and one on land.

- Frogs are the only organisms which exhibit cutaneous, branchial and pulmonary respiration in during different stages of their life cycle.
- Adult frogs can breathe through their skin. Skin is moist and slimy helping the animal to respire through skin under water as well as on land. This is termed to be cutaneous respiration.
- Adult frogs while on land respire through lungs. Lungs are the respiratory organs which help in exchange of gases. This is termed to be pulmonary respiration.
- Tadpoles, the larval stages of frog live in water. They respire through their gills as they do not possess well developed lungs. This is termed to be branchial respiration.

Chapter- 10
RESPIRATION IN ORGANISMS

I Fill in the blanks:

1. Oxygen we inhale is used to breakdown _____ into _____ and water and release _____ in the process.

2. The breakdown of glucose occurs in the cells of an organism and is called _____ respiration.

3. If the food is broken down with the use of oxygen it is called _____ respiration.

4. If the food is broken down without the use of oxygen it is called _____ respiration.

5. During heavy exercise, supply of oxygen to our _____ cells is insufficient and food breakdown is by _____ respiration.

6. During _____ our lungs expand and then come back to the original state as the air moves out during _____.

7. Increased _____ _____ enhances the rate of breathing.

8. In animals like cow, buffalo, dog and cat the respiratory organs and the process of breathing are similar to those in _____.

9. In cockroaches, air enters the body through small openings on the side of the body called _____.

10. Heavy exercise always gives us cramps in the leg due to accumulation of _____ _____.

11. Normal range of breathing in an adult person at rest is _____.

12. During exhalation ribs move _____ and _____, while diaphragm moves _____ to its former position.

13. Frogs breathe through their _____ and _____.

14. In anaerobic respiration, as in _____, glucose breaks down into _____ and CO_2, and releases _____.

15. Earthworms breathe with their _____.

16. Leaves breathe through tiny pores called _____.

17. _____ are present in fish for breathing.

18. Insects have a network of air tubes called _____ for gas exchange.

19. The skeletal structures that surround the chest cavity are the _____.

20. The muscular floor of the chest cavity is called _____.

21. The openings through which we inhale are called _____.

22. Yeasts are used to make beer and _____ because when they breathe anaerobically they yield _____.

23. Our breathing involves the movement of the _____ and the _____ _____.

24. Plants carry out both _____ and _____ during the day and only _____ during the night.

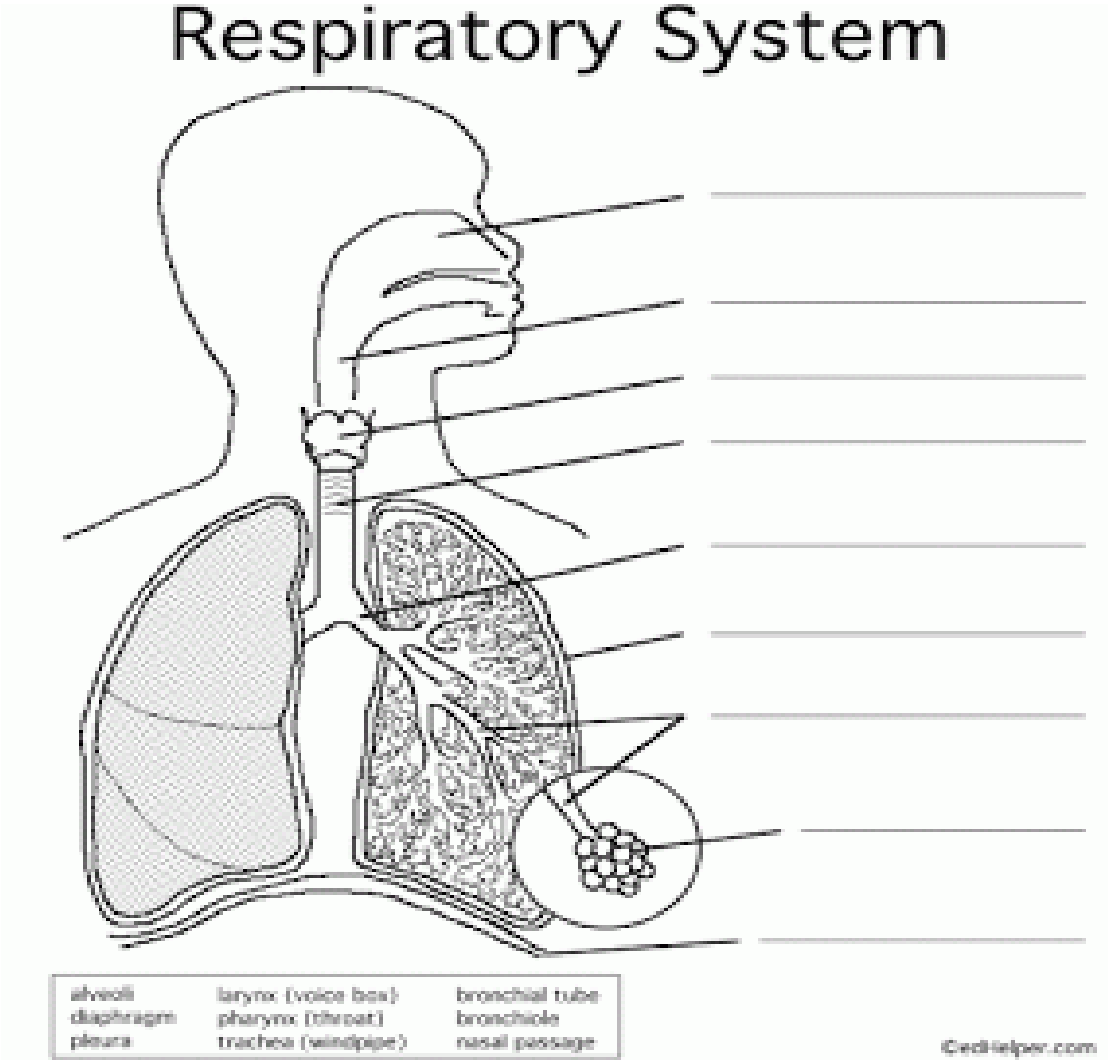
II Answer the following questions:

1. Why do you get muscle cramps after heavy exercise?
2. How can we get relief from cramps? Why does it give relief?
3. What do you mean by breathing? Can we survive without breathing ?
4. What is understood by **'breathing rate'**? What is the normal breathing rate of an adult?
5. Why do we eat more and breathe faster after an exercise?
6. When is our breathing rate the slowest?
7. Describe the process of inhalation.
8. Give the formulas of aerobic and anaerobic respiration.
9. Why do we sneeze?

III Differentiate between the following

1) Respiration and Photosynthesis
2) Breathing and Cellular

IV Label the following diagram



V. Give Reasons:

1. A child blows out air on the surface of a clean cold mirror and notices droplets of water after sometime. Why does this happen?
2. What will happen to a cockroach if it is made to drown in water?
3. Why should we breathe through the nose and not through the mouth?
4. Sachin came back home after a cricket match. His legs were paining, so he took hot water bath and felt relaxed. Explain.

VI. MULTIPLE CHOICE QUESTIONS

1. What is the "pipe" between the mouth and stomach called?
a. Epiglottis
b. Trachea
c. Esophagus
d. Appendix

2. What are the increasingly smaller airways branching off into the lungs called?
a. Air sacs
b. Bronchial tubes
c. Capillaries
d. Lungs

3. What are the bubble-shaped sacs in the lungs where gas exchange takes place called?
a. Capillaries
b. Bronchial tubes
c. Alveoli
d. Lungs

4. When you inhale, the air pressure in the chest cavity...
a. stays the same, allowing both pressures to be equal
b. increases, allowing lungs to expand
c. decreases, allowing outside air to flow into the lungs
d. there is no air pressure in your chest cavity

5. Where does the transfer of oxygen into the bloodstream take place?
a. In the heart
b. In the trachea
c. In the alveoli
d. In the nasal passages

6.Emphysema is a disease of the lungs that can best be prevented by:
a. healthy diet
b. exercise
c. never smoking
d. taking vitamins

LAB ACTIVITIY

Objective: To show that exhaled air contains carbon dioxide.

Materials required: Freshly prepared Lime water, straw, test tube.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

Equation of reaction:

CHAPTER 11

TRANSPORTATION IN ANIMALS AND PLANTS

NOTES

HUMAN CIRCULATORY SYSTEM

What is the job of the Circulatory System?

The **Circulatory System** is responsible for transporting materials throughout the entire body. It transports nutrients, water, and oxygen to your billions of body cells and carries away wastes such as carbon dioxide that body cells produce.It is an amazing highway that travels through your entire body connecting all your body cells.

Parts of the Circulatory System

The circulatory System is divided into three major parts:

1. The Heart
2. The Blood
3. The Blood Vessels

The Heart

The **Heart** is an amazing organ. The heart beats about 3 BILLION times during an average lifetime. It is a muscle about the size of your fist. The heart is located in the centre of your chest slightly to the left. Its job is to pump your blood and keep the blood moving throughout your body.

The Blood

It consists of fluid part the plasma and solid part consists of three types of cells.

Plasma

- Fluid part of blood which is straw colored
- 90-92%of plasma is water
- Carries carbon dioxide, hormones, waste, digested food, antibodies, some mineral ions, and enzymes.

Blood Cells

Red Blood Cells are responsible for carrying oxygen. Red Blood Cells pick up oxygen in the lungs and transport it to all the body cells. There are about 4.5-5million **r**ed blood cells in one

cubic millimeter of blood. The RBC's contain an iron containing pigment called hemoglobin. Hemoglobin carries oxygen. They are biconcave disc shaped and live for 120 days.

White Blood Cells help the body fight off germs. White Blood Cells attack and destroy germs when they enter the body. When you have an infection your body will produce more White Blood Cells to help fight an infection. They are amoeboid in shape or may be oval in outline. Their number is 6,000-10,000 per cubic mm of blood. They survive from few hours to few days. They are called soldiers of the body as they fight disease and provide immunity to the body.

Platelets are blood cells that help stop bleeding. When we cut ourselves we have broken a blood vessel and the blood leaks out. They help in clotting of blood. There are 250,000 platelets per cubic mm of blood. Their life span is about 25-29 days.

The Blood Vessels

There are three types of blood vessels in human body

1. Arteries
2. Capillaries
3. Veins

Arteries

- Carry blood away from the heart (always oxygenated other than the pulmonary artery which goes to the lungs)
- Have thick muscular walls
- Have small passageways for blood (internal **lumen**)
- Contain blood under high pressure
- No valves present and are close to skin

Veins

- Carry blood to the heart (always de-oxygenated other than pulmonary vein which goes from the lungs to the heart)
- Have thin walls
- Have larger internal *lumen*
- Contain blood under low pressure
- Have valves to prevent blood flowing backwards and are close to skin

Capillaries

- Found in the muscles and lungs
- Microscopic – one cell thick
- Very low blood pressure
- Where **gas exchange** takes place. Oxygen passes through the capillary wall and into the tissues, carbon dioxide passes from the tissues into the blood

STRUCTURE and FUNCTION OF HUMAN HEART

The heart is a muscular organ about the size of a closed fist that functions as the body's circulatory pump. It takes in deoxygenated blood through the veins and delivers it to the lungs for oxygenation before pumping it into the various arteries (which provide oxygen and nutrients to body tissues by transporting the blood throughout the body). A double-walled sac called the pericardium encases the heart, which serves to protect the heart and anchor it inside the chest. The muscles that make up the human heart are called cardiac muscles.

Chambers of the Heart

- The heart contains 4 chambers: the **right atrium**, **left atrium**, **right ventricle**, and **left ventricle**.
- The atria are chambers on top, are smaller than the ventricles and have thinner, less muscular walls than the ventricles.
- The atria act as receiving chambers for blood, so they are connected to the veins that carry blood to the heart.
- The ventricles are the larger, stronger pumping chambers that send blood out of the heart. The ventricles are connected to the arteries that carry blood away from the heart.
- A wall of muscle called the septum separates the two sides of the heart.
- Each atria open into the respective ventricle through an aperture or hole which is guarded by a valve. (Tricuspid and Bicuspid Valves)
- The heart pumps oxygenated blood into the main artery called Aorta that leaves the left ventricle.
- Aorta carries oxygen rich blood to all organs of the body.
- The main vein called Vena Cava brings CO2 rich blood back to the right atrium.
- From right atrium blood goes to right ventricle
- The contraction of the right ventricle pushes the blood into the pulmonary artery that carries CO2 rich blood to the lungs for oxygenation.
- The oxygenated blood from the lungs is brought back to the left atrium by the pulmonary vein.
- The oxygenated blood from the left atrium is sent to the left ventricle and then to all parts of the body through the Aorta.
- At the base of Aorta and Pulmonary artery semi lunar valves are present that prevent the backflow of blood.
- Thus there is double circulation of blood in humans
- Between heart and body organs- systemic circulation
- Between heart and lungs- pulmonary circulation

Chapter 11

TRANSPORTATION IN ANIMALS AND PLANTS

1. Fill in the blanks:

a) _____ carry blood from all parts of the body back to heart.

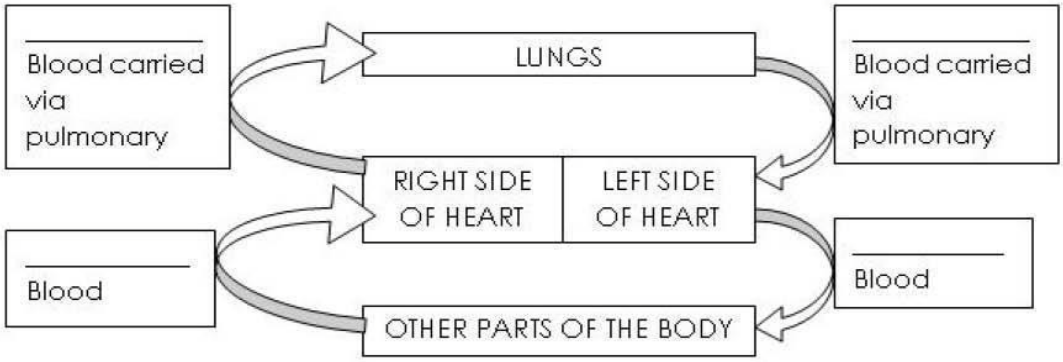
b) The process that causes ascent of water in plants is called _____

c) A normal heart beats about _____ times per minute which can be measured with the help of an instrument called _____.

d) The _____ present in _____blood cells transports oxygen to all parts of the body.

e) The main organs of excretion in the human body are _____ and an adult human being passes about _____ L of urine per day.

2. Complete the flow diagram given below:.



Word Bank: Oxygen-rich, carbon-dioxide rich, artery, vein.

3. Give **one** function of each of the following:

a) Urinary Bladder

b) Blood platelets

c) Haemoglobin

d) Capillaries

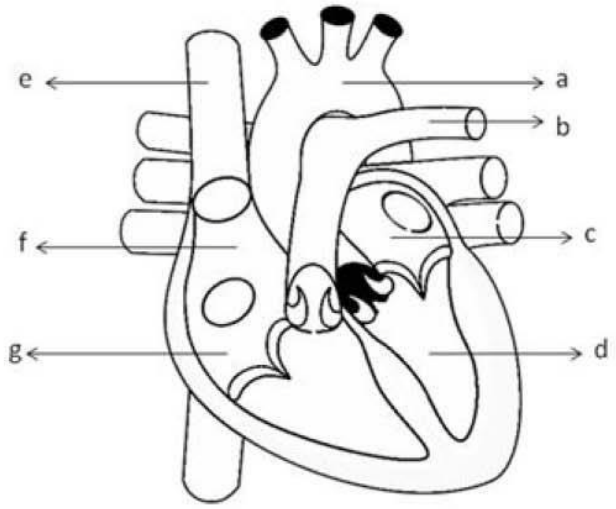
e) Stomata

4. Name the artery that carries oxygen rich blood from left ventricle to all parts of the body.
5. Define Pulse.
6. Give the composition of urine formed in humans.
7. Differentiate between the following pairs:
   a) Xylem and Phloem
   b) Arteries and Veins
   c) Egestion and Excretion
8. List any three functions of blood.
9. What is the significance of sweat formation in humans?
10. Root hair help the plants to absorb water and minerals. How?
11. What prevents mixing of oxygen rich blood and carbon dioxide rich blood in human heart?
12. Sponges and Hydra neither require a circulatory system nor a circulatory fluid like blood. Why?
13. In a state of bacterial infection like cholera, which cells are expected to attack the germs?
14. Draw neat and well-labelled diagrams of the following:

a) Circulation of blood in humans

b) Human Excretory System

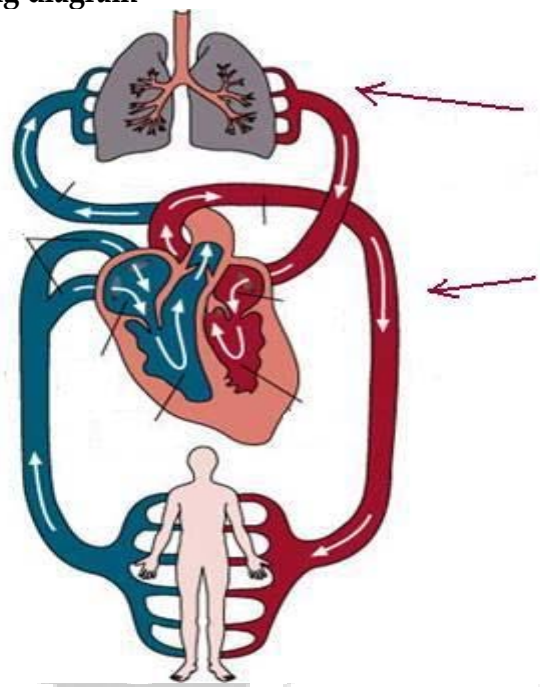
15. Label the diagrams given below:



HUMAN HEART

STETHOSCOPE

Label the following diagram



VALUE BASED QUESTIONS:

1. Ram was returning from his office in the late evening hours when he witnessed a near fatal accident on the road. The driver of the car was lying unconscious in a pool of blood. Ram quickly rushed the injured driver to nearby hospital in his car and offered to donate his blood at the hospital to save his life.
   a. Why severe blood loss does during an accident poses risk to life?
   b. Ram offered to donate his blood even without getting his blood group matched with the injured driver. What could be his blood group?
   c. What traits of Ram's character tell about him with this act?

2. Rohan was diagnosed with kidney failure and had to be supported by an artificial kidney till he got a suitable donor. Soon he underwent a kidney transplantation using the kidney donated by his friend and recovered.
   a. What is the medical procedure of using artificial kidney known as?
   b. If you were in rahul's friends place what would you do?

LAB ACTIVITY

Objective: To show transportation of water through the cells of potato.

Material required: 2 potatoes, peeler, knife, salt solution, coloured water, pins, and petridish.

Procedure:

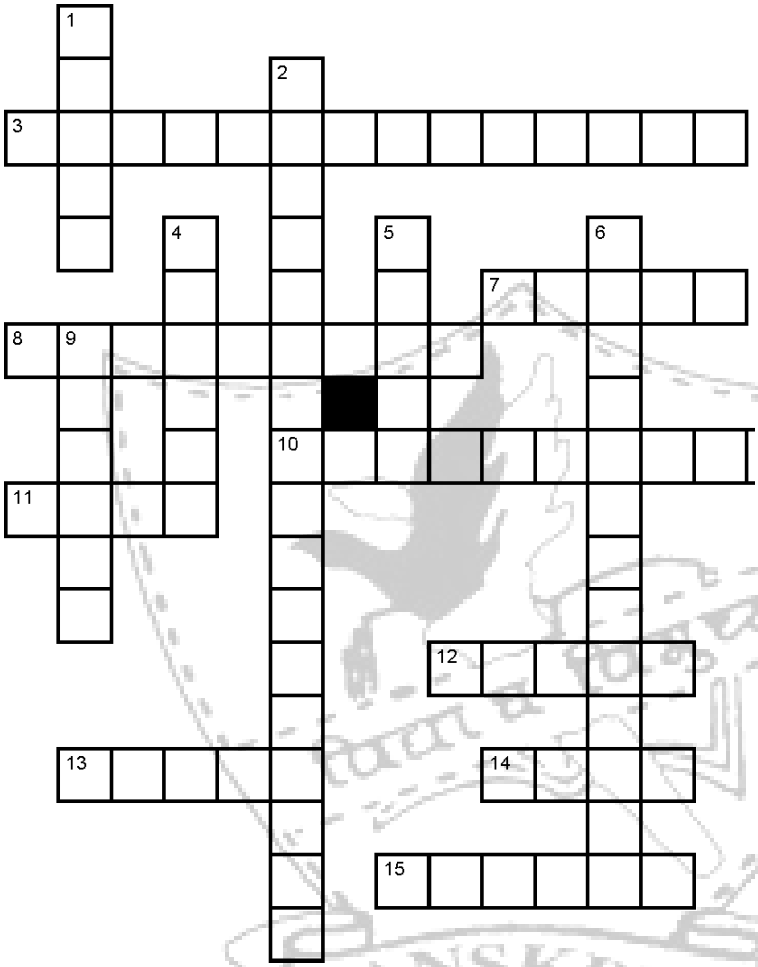
Diagram:

Observation:

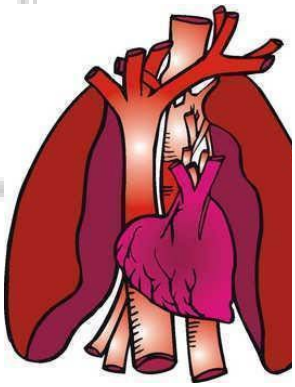
Conclusion:

Precautions:

The Circulatory System



Find the circulatory system words below in the grid to the left.



Clues given on the next page…….

Across

Down

3. The place where nutrients enter the blood.

7. The pump in the circulatory system.

8. A small vessel that connects veins and arteries.

10. The circulatory system _____ nutrients, gases, liquids, and heat around the body.

11. The circulatory system transports this, which helps regulate temperature.

12. The liquid in the circulatory system.

13. The place where oxygen enters the blood and carbon dioxide leaves the blood.

14. A vessel that moves blood to the heart.

15. A gas that is transported in arteries from the lungs to the rest of the body via the heart.

1. The heart _____ blood.

2. The heart, blood, and vessels.

4. Blood in arteries is _____ red because it is rich in oxygen.

5. The largest artery in the body.

6. A waste gas that is transported in veins from the body to the lungs via the heart.

9. A vessel that moves blood away from the heart.

Chapter 12

Reproduction in Plants

Reproduction

Reproduction is the process by which living organisms produce more of their kind. Plants reproduce either sexually or asexually.

I. Asexual mode of reproduction

It is the process which involves single parent in giving rise to offspring. It is the growth of a new plant from a part of the plant other than the seed.

Modes of asexual reproduction in plants

Plants reproducing by asexual mode do not produce gametes. A single parent multiplies to give rise to new individuals. Different modes of asexual reproduction in plants are elucidated.

1. Vegetative propagation is the production of new plants from the vegetative parts of the plant. Roots, stems and leaves are called the vegetative parts of a plant. Vegetative propagation takes place by different methods like Leaf propagation, Root propagation, Underground stem propagation etc.

a) Leaf propagation: *Bryophyllum* propagates vegetatively by the formation of leaf buds on the margins of a leaf. When the buds come in contact with moist soil, each bud is capable of growing into a new plant.

b) Root propagation: Sweet potato and Dahlia are cut into many pieces and are covered with mud. Each piece of the root tuber is capable of growing into young plant.

c) Stem propagation: In money plant, stem is cut and one side of it is buried in the soil. This stem from the parent plant grows into a new plant.

d) Underground stem tuber propagation: Potato is a stem tuber growing underground. It bears special structures called as eyes on it. When a potato is cut and buried under the soil. Each eye having a bud developed into a new plant.

e) Underground stem propagation: Ginger is an underground stem called as rhizome. It has lot of scaly leaves atnodes. These when buried under the soil gave rise to new plants.

2. Budding involves the growth of a small bulb-like projection called as bud. This bud grows and detaches itself from the parent cell to grow independently into a new organism.

a. Yeast reproduces by budding.

b. Yeast is a unicellular organism belonging to the category of Fungi.

c. It reproduces the new individual by the process of budding.
d. Little amount of cytoplasm forms a protuberance.
e. Nucleus divides into two. One nucleus migrates into the bud.
f. Bud gets detached from the parent to develop into new individual.
g. During budding, yeast respires and releases carbon dioxide.
h. The carbon dioxide released helps the dough to puff up and become spongy. Hence, it is used to bake a cake and to make dough.

3. Fragmentation involves breaking down of filaments into fragments that grow into young ones.

a. Algae are green, thread-like plants that grow in stagnant water, ponds and lakes.
b. They float on the surface of the water causing algal bloom.
c. Algae reproduce by the method of fragmentation.
d. As it is a multicellular organism, each cell strips of as a fragment and falls on the substratum
e. It gets its strength to develop into new individual.

4. Spore formation is the method of developing new individuals by forming reproductive structures called spores.

- A spore is a small spherical or oval structure which protects the future individual in a thick protective covering.
- Spore germinates on a substratum under favourable conditions.
- Some organisms like ferns, some groups of fungi reproduce by spore formation.

a. Ferns reproduce by releasing spores that germinate into young ones.
b. Fungus reproduces by means of spores. Fungus like bread mould produces spores which germinate on moist organic surfaces. The cottony white mass on bread formed by fungus after spore germination is called a mould. Spores can survive in extreme conditions because of the protective hard coat.
c. Moss also reproduces by spores.

II. Sexual mode of reproduction

This type of reproduction involves two organisms of opposite sex, the male and the female. Reproductive organs in plants produce gametes – ovules (eggs) and pollen grains.

- Egg is the female gamete produced by ovary.
- Pollen grains are male gametes produced by stamens.
- A zygote is the future individual formed by the fusion of an egg and a pollen grain. Zygote develops into a seed.

- Seeds enclose embryo, the future individual until favourable conditions prevail for the development of embryo into a plantlet.

Reproductive structures of a plant

Flowers are the reproductive structures which help the plant to undergo the process of sexual reproduction. These are the most attractive parts of the plant. A flower may have a stalk-like structure called the pedicel which helps in its attachment to the plant.

Structure of a flower

A complete flower is made up of four whorls on it. These are sepals, petals, stamens and the pistil. These four whorls are attached to flattened tip of the flower called as receptacle.

- Sepals collectively form calyx. These protect the inner parts of the flower in its bud condition.
- Petals collectively form corolla. These are the coloured structures which attract insects and birds for pollination.
- Stamens are the male reproductive parts. Stamen is made up of two structures namely, a filament and an anther. Filament is a tubular structure. Anther is a knob-like structure containing pollen grains. Pollen grains act as the male gametes or the male reproductive cells.
- Pistil is the centrally located female reproductive part of a flower. It is made up of stigma, style and the ovary. The stigma is a flattened structure which receives the pollen. It is sticky in nature. The style is long tubular structure which conveys pollen to the ovary. The ovary contains numerous ovules. Each ovule contains a female gamete or egg cell.

Types of flowers

Flowers based on the reproductive whorls they carry, can be classified into unisexual flowers and bisexual flowers.

- A unisexual flower is the flower which consists of either stamens or pistil. A flower with a whorl of stamens is called as male flower. A flower with just a pistil is called as a female flower.
- A bisexual flower is the flower which consists both the whorls of stamens and pistil. i.e. male and female reproductive structures.

Pollination

Pollination is the transfer of pollen from the stamen to the stigma.

- Different factors which help in the transfer of pollen are called as agents of

pollination. Agents of pollination include air, water, birds, insects, animals etc.

- Pollination can be of two types namely, self-pollination and cross-pollination.
- Self pollination is the transfer of pollen from the stamen to the stigma of the same flower. Cross-pollination is the transfer of pollen from the stamen of one flower to the stigma of another flower on the same plant or a different plant of the same kind.

SELF-POLLINATION	CROSS-POLLINATION
It occurs between the flowers of the same plant.	It occurs between the flowers on the different plants of the same variety.
It does not require any agents for pollination.	It requires agents like air, water etc for pollination.

Fertilization

- Stigma of the flower secretes sugary substances.
- As the pollen grains from the stamen fall on the stigma, they recognise the sugary substance and germinate to produce a structure called as pollen tube.
- Pollen tube grows in size through style to reach the egg in the ovary.
- As it reaches the ovule, the tip of the tube opens and releases male gametes to fertilise the egg cell.
- The fusion of a male gamete and a female gamete to produce a zygote - single cell.
- Zygote which develops into an embryo.
- Fertilized ovary becomes a fruit.
- The ovule develops into a seed.

Formation of seed

There occur some changes in the flower after the process of fertilization.

- Sepals, petals, stigma and the style fall off leaving the fertilized ovary.
- Zygote utilises the reserved food in the ovule to divide and transform into an embryo.
- Walls of the ovule develop hard layers of the seed.
- A seed contains a young plant and stored food in the form of cotyledons.

Formation of fruit

Ovary grows in size due to formation of seeds. This well-grown fertilized ovary becomes the fruit. A fruit can have any number of seeds in it. Fruits can be fleshy or dry in nature.

Chapter 12

REPRODUCTION IN PLANTS

1. Fill in the blanks:

a) _____ is the reproductive part of a plant.

b) Fungi, ferns and mosses reproduce by _____.

c) A type of asexual reproduction in plants in which roots, stems and leaves are used is called _____.

d) Reproduction or propagation by stem is common in _____.

2. Circle the **odd** one out and **give reasons** for the choice of your answer:

a) Leaf, root, stem, flower.

b) Budding, spore formation, fruit formation, fragmentation.

c) Anther, stigma, ovary, style.

d) Rose, papaya, *Petunia*, mustard

3. Differentiate between the following and give **examples** wherever possible:

a) Asexual and sexual reproduction.

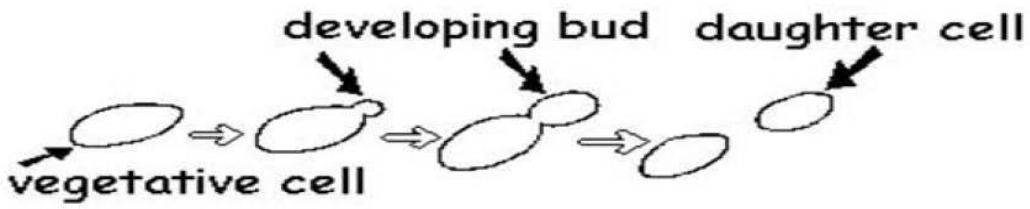
b) Stamen and Pistil

c) Self-pollination and cross-pollination.

d) Unisexual and bisexual flowers.

4. Write the correct sequence of the following events that take place during sexual reproduction in plants:
Fertilisation, pollination, development of embryo, germination of pollen tube, seed formation, falling off of all parts of flower except ovary.

5.]



a) Name the type of asexual reproduction shown in the above diagram.

b) Give an example of organism showing the above method of reproduction.

6. Describe the process of fragmentation with the hep of a diagram.

7. Define fertilisation. List the sequence of events that take place in a flower after fertilisation.

8. Give any two uses of seed dispersal. How are the seeds of following plants dispersed?

a) Grass

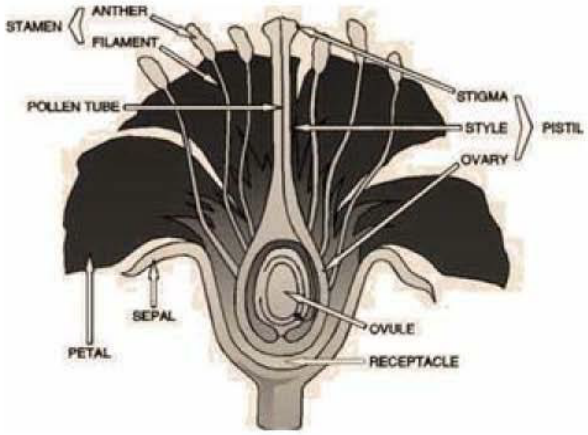
b) *Urena*

c) Coconut

d) *Xanthium*

e) Drumstick

9. In the diagram of the flower given below:



a) Where is female gamete or egg formed?

b) Which part of the flower contains pollen grains?

c) Name the parts of the flower that form the fruit and seeds respectively.

10. Draw neat and well-labelled diagrams of the following:

a) Maple seed

b) Stamen

c) Pistil

d) Leaf of *Bryophyllum* showing leaf buds.

VALUE BASED QUESTION:

Aditya came back from school and he saw that the shoots were growing from the eyes of the potato in a vegetable basket in his kitchen. He took the potato and separated the eyes and planted in his kitchen garden. Why did he do so? If you were in his place what would you do?

LAB ACTIVITY

Objective: To study the parts of a flower.

Materials required**:** China rose flower, forceps, hand lens, dissecting blade, microscope and needle.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

CHAPTER-13

TIME AND MOTION

Assignment-13.1

Q1. Fill in the blanks:

a) In a modern wrist watch time is measured by the vibration of a_____ crystal.

b) The S.I. unit of time is _____.

c) The _____ of a pendulum remains constant if length is fixed.

d) Speed = _____/ Time.

Q2. Choose the correct option

a) Which of these are units of time

- Second
- Hour
- Light year
- Year

b) The time period of a simple pendulum depends upon

- The mass of the bob
- The displacement of the bob
- The length of the string

Q3. How is a stop watch different from an ordinary watch?

Q4. A car takes 20 min. to cover a distance of 15km.Find its speed in km/h and m/s.

Q5. The distance between two towns is 400km How much time would it take a car to cover this at an average speed of 50km/h

Q6. A man driving at an average speed of 40km/h takes 6hr to travel from one town to another. What is the distance between the two towns?

Q7. Plot a distance time graph for a body travelling at a speed of 2.5m/s.

Q8. If you want to change the time period of a pendulum what should you do?

Q9. What is uniform motion?

Q10. What are the common units to measure speed?

Open Ended Questions

a) If we wanted to change the time period of a pendulum, what do you think we should do?

b) What is the unit of time period?

CHAPTER 13

MOTION AND TIME

Activity 1

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

Materials required:

Theory:

Diagram :

Procedure :

Observation table:

S No	Length of string (cm)	Time taken to complete 20 oscillations (s)	Time period (s)

Conclusion:

CHAPTER 13

MOTION AND TIME

Assignment 13.1

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 by
   a) odometer
   b) ammeter
   c) anemometer
   d) speedometer

5) The graph of an object moving with uniform motion 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

11) Which of these is not a unit of speed?
a) m/s
b) km/h
c) s/m
d) km/min

12) The unit of time period is
a) second
b) metre
c) metre per second
d) $(\text{second})^2$

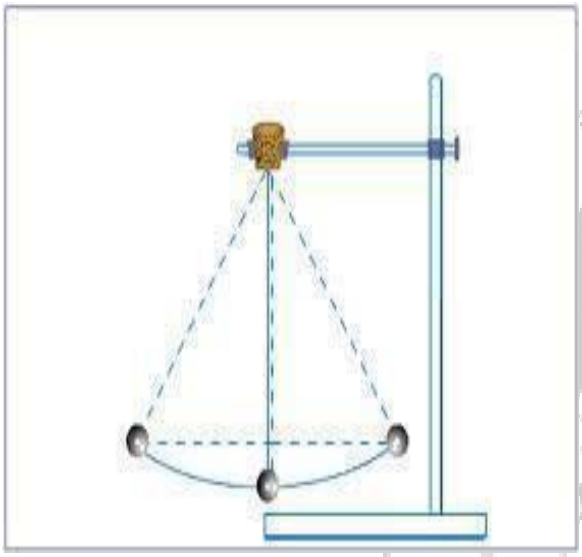
13) Which clock is most accurate?
a) sundial
b) waterclock
c) hourglass
d) pendulum clock

CHAPTER 13

MOTION AND TIME

Assignment 13.2

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 – _____

One oscillation of pendulum - _____

_____

_____

_____

Time period – _____

_____

_____

Frequency - _____

_____

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. Which device measures the speed of a vehicle at an instant?

4. Which device measures the distance travelled by a vehicle?

5. What type of motion is exhibited by a simple pendulum?

6. Plot distance-time graph for the following data and interpret its motion:-

(a)

distance(m)	0	3	6	9	12	15
time(s)	0	5	10	15	20	25

(b)

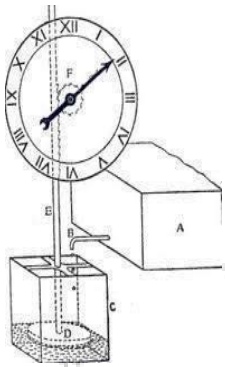
distance(m)	0	3	6	15	27	39
time(s)	0	5	10	15	20	25

CHAPTER 13

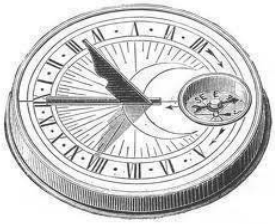
MOTION AND TIME

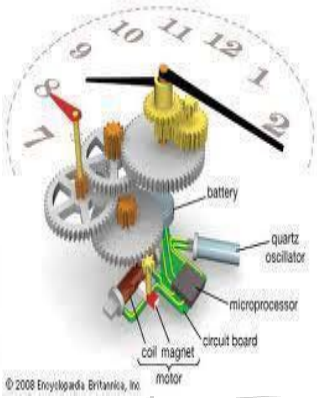
Assignment 13.3

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



_____ _____





_____ _____


MPH
km/h
P R N D 2 1


km/h
www.shutterstock.com · 6767938

_____ _____

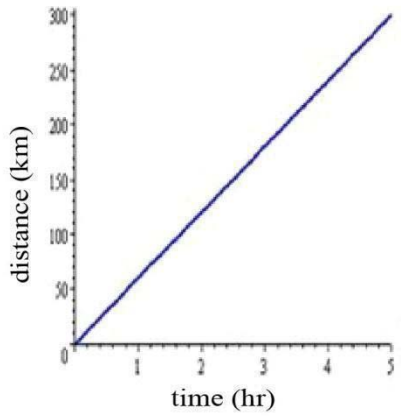
CHAPTER 13

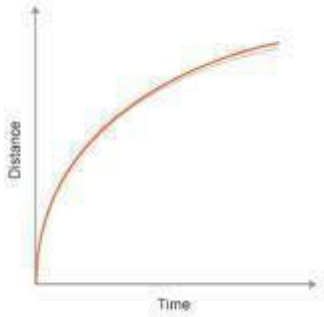
MOTION AND TIME

Assignment 13.4

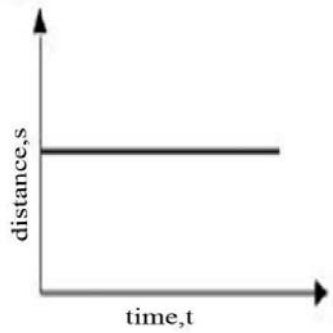
Answer the questions for each of the figure:-

1. What can you say about the motion of the body in each of the graphs?





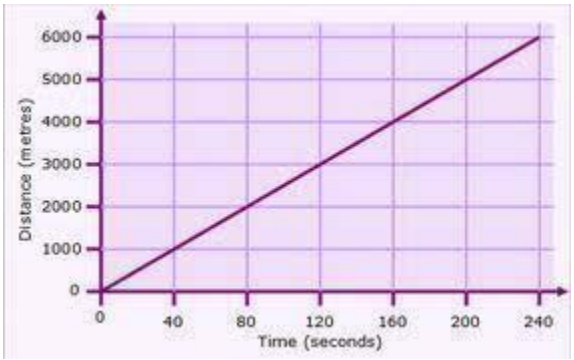
_____ _____



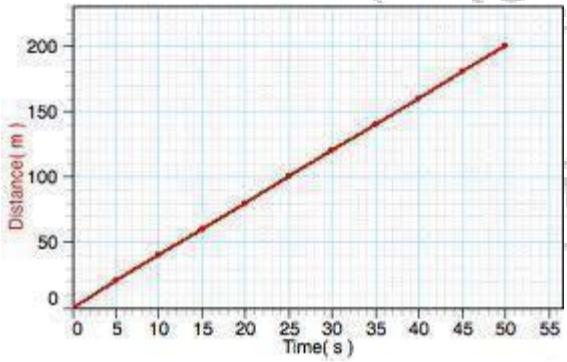
_____

2. Calculate the speed for the given graphs :-

a) Calculate speed of the body between 0 – 200 s graphically.



(b) Calculate the speed of the body between 0 – 50 s.



CHAPTER 13

MOTION AND TIME

Assignment 13.5

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

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.

Uniform motion – An object moving along a _____ line with _____ speed (covers equal distances in equal intervals of time) is said to be in uniform motion.

Non-uniform motion – An object moving along a _____ line with _____ speed (covers unequal distances in equal intervals of time) is said to be in non-uniform motion.

Speed – It is the _____ travelled per unit time by a moving object.

$$\text{speed} = \frac{\text{distance}}{\text{time}} \quad ; \quad \text{average speed} = \frac{\text{total distance travelled}}{\text{total time taken}}$$

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

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

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

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

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

Odometer – It measures the _____ travelled by a vehicle.

CHAPTER 13

MOTION AND TIME

Assignment 13.6

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 60km in 2h?
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 9km. Calculate its speed in km/h. Convert it into m/s.
4. A box of chocolates is kept at a place 50 m away. How long will a boy take to reach the box if he runs at a speed of 10 m/s.
5. A train covers first 100 m in 2h and the next 100 m in 1h. Calculate its average speed.
6. The bus covers 40km in 1h and the next 50 km in 1h. 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. A man driving at an average speed of 40 km/h takes 6 h to travel from one town to another. What is the distance between the two towns?
9. The distance between two towns is 400 km. How much time would it take a car to cover this distance at an average speed of 50 km/h?
10. What is the time period of a simple pendulum which completes 20 oscillations in 40seconds?

CHAPTER 13

MOTION AND TIME

Assignment 13.7

(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) If you want to change the time period of a simple pendulum, what should you do?

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

c) What are the usual units to measure distance and speed?

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

e) What is the SI unit of time period?

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. Why is 'invar' used in making a pendulum clock?

4. 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?

5. Find out why and how the concept of **TIME** evolved?

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

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:

Conclusion:

CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

Activity 2

Aim: To observe the magnetic effect of current

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

Theory: When electric current flows through a wire, the wire behaves like a magnet. This is called magnetic effect of current.

Diagram:

Procedure: 1. Connect the solenoid 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 3

Aim: To observe the working of an electromagnet

Materials required:

Theory:

Diagram:

Procedure:

Observation:

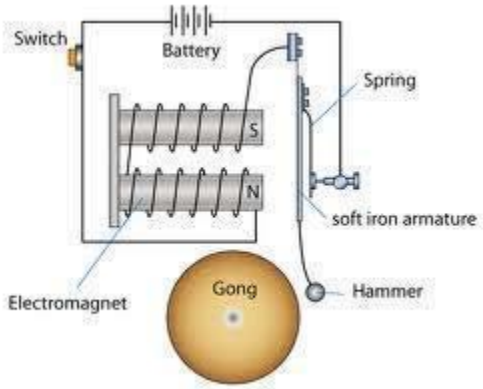
Conclusion:

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 _____.

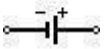
b) An electric fuse is based on _____ effect of current.

c) The filament of an electric bulb is made of a metal of _____ melting point.

d) Nichrome is used for making _____.

e) The materials used as a filament of a bulb and that used in electric iron are _____ and _____ respectively.

f)  is the symbol of _____ _____.

g)  is the symbol of _____.

h) The wires used for connections in a simple circuit are represented by _____.

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

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

5. An electromagnet is a _____ magnet.
   (a) permanent (b) temporary
   (c) naturally occurring (d) both (a) and (b)

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 – _____

THINK and ANSWER!!!

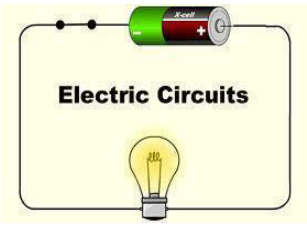
BULB

The bulb is new, filament is not broken and connections are tight.

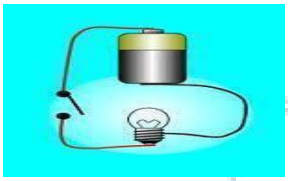
In the given circuit, the bulb does not glow. Identify the possible reasons.

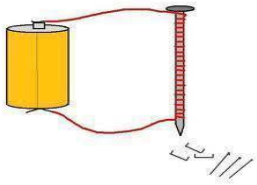
CHAPTER 14

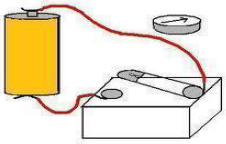
ELECTRIC CURRENT AND ITS EFFECTS
Assignment 14.3

1. 

Draw the circuit diagram for the given figure.

2. 
Draw the circuit diagram for the given figure.

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 3 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

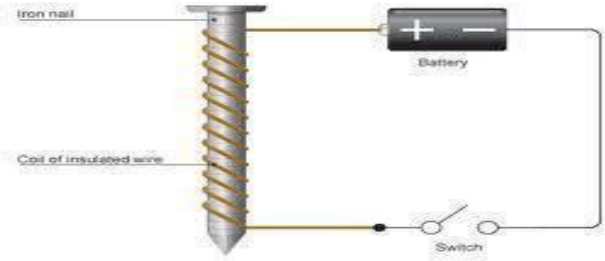
1. Why do we use a soft iron core in an electromagnet?
2. Write 3-4 practical applications of electromagnet.
3. The strength of electromagnet depends on what factors?
4. What is an electric fuse? On what principle does it work?
5. What happens when an iron nail is kept inside a current carrying coil?
6. 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?
7. What are fuse wires generally made of?
8. What is the material used for making heating elements?
9. What is an electromagnet?
10. Why do we use fuse in our household circuits?
11. Who was the first person to observe deflection of compass needle when current passes through a nearby wire?
12. How can you show that an electric current produces magnetic effect?
13. How will prove that an electromagnet is a temporary magnet?

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 is wound around an _____ _____. When electric current is allowed to _____ through the wire, the iron nail becomes _____. When the _____ is turned off, the iron nail loses its _____.

2. Solve the crossword below :-

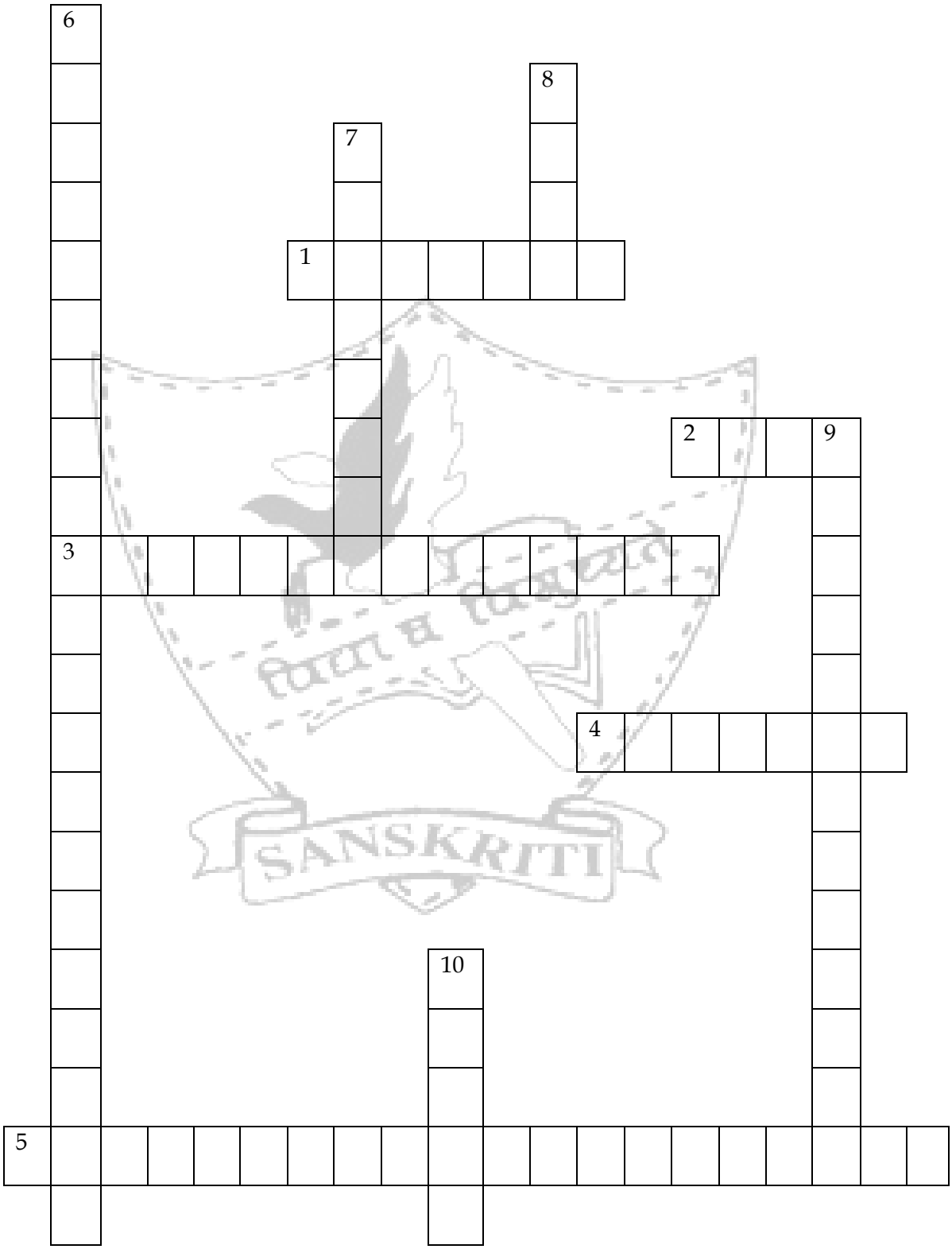
ACROSS

1. Coil of wire present in a room heater is called _____. (7)
2. Wires of low melting point are used for making _____.(4)
3. Symbols of electric components are used in this. (7,7)
4. Combination of two or more cells. (7)
5. Scientist who studied magnetic effect of current. (4,9,7)

DOWN

6. Now-a-days these are used in place of fuse. (9,7,7)
7. Wire of high melting point and high resistance is used to make _____ of bulb. (8)
8. Current stops flowing when the switch is _____. (4)
9. Soft iron core with insulated copper wire wound around it in an electric bell. (13)
10. Working of electric heaters, kettles, iron,etc are based on _____ effect of current. (7)

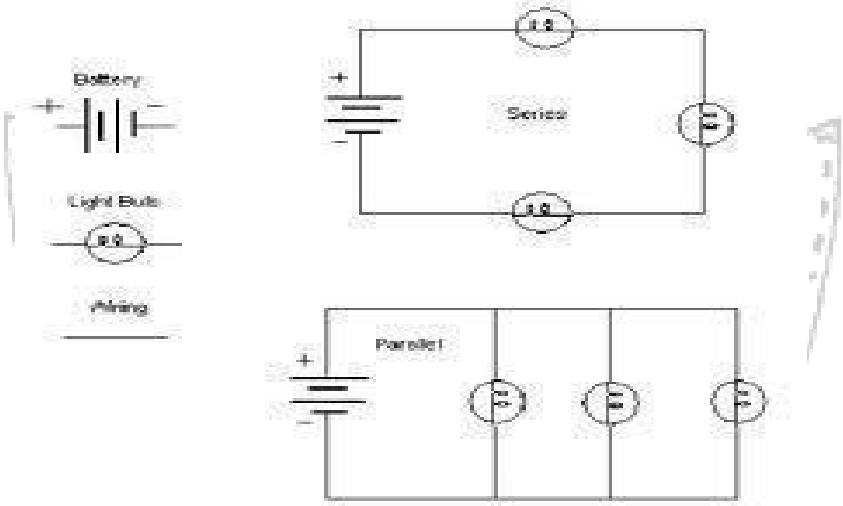
11.



CHAPTER 14

ELECTRIC CURRENT AND ITS EFFECTS

HIGH ORDER THINKING SKILLS



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

   a) In which case will all the bulbs glow with same brightness? Explain your answer.

   b) In which case, the bulbs will not glow with same brightness?

   c) Compare the connections of the three bulbs in both figures. How are they different?

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

3. The 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

Activity 1

Aim: - To study reflection of light

Materials required:-

Theory: -

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:-

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) When you stand in front of the mirror and look at you image, what can you say about the height of the image as compared to your height?

_____

_____

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

Observation 1 _____

Observation 2 _____

CHAPTER 15

LIGHT

Activity 4

(A)

To identify the convex and concave lenses

Activity	**Lens 2**	**Lens 1**
Place the lens on a plane surface, slide a paper below the lenses and jot down your observations.		
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		

CHAPTER 15

LIGHT

Assignment 15.1

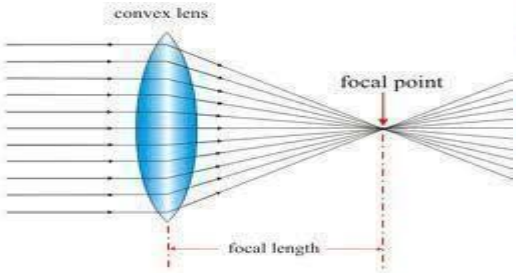


Fig 1

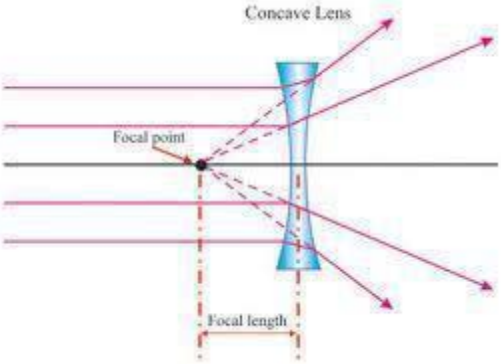
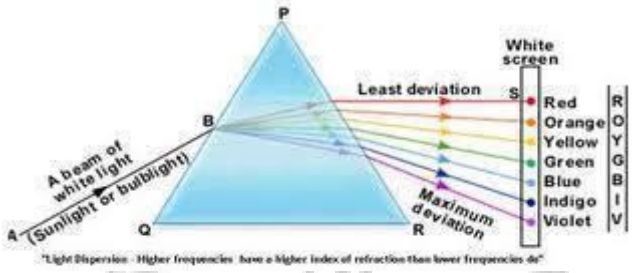


Fig 2

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.



4. 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 _____.

5. Why is AMBULANCE written like this?

CHAPTER 15

LIGHT

Assignment 15.2

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.

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 15.3

1. Differentiate between real and virtual images.

2. Name the type of mirror which produces
   a) real and magnified image
   b) virtual and same sized image
   c) virtual and diminished image

3. Why are convex mirrors used as rear view mirrors?

4. Which type of mirrors is used in making periscopes and kaleidoscopes?

5. Which mirror causes lateral inversion of image?

6. On the basis of images formed, state one similarity and one difference between a plane mirror and convex mirror.

7. Which type of images can be formed on the screen?

8. The following are the names of some devices and instruments. Place them in the correct column:-

Spectacles, magnifying glass, telescope, photographic camera, microscope, shaving mirror, torches, projectors, automobile head lamps, rear view mirror, on sharp turn of roads, binoculars, dentist's mirror, in malls to check shoplifters, dressing table, kaleidoscope, periscope.

Plane Mirror	Convex Mirror	Concave Mirror	Convex Lens	Concave Lens

CHAPTER 15

LIGHT
Assignment 15.4

1. Classify the following surfaces as reflecting or non – reflecting:-
   1. stainless steel plate (new) –
   2. newspaper
   3. wood
   4. glass sheet
   5. polished metal sheet

2. 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?

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

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

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

6. What are the uses of a plane mirror? [mention at least 3]

7. Can we obtain the image formed by a plane mirror on a screen?

8. Match the following:-

Column A	Column B
Real image	polished surface
Virtual image	irregular surface
Rectilinear propagation	plane mirror
Regular reflection	travels in straight line
Periscope	seen on screen

Diffused reflection cannot be formed on screen

CHAPTER 15

LIGHT

Assignment 15.5

1. Give one word for the following :-

   a) A plane highly polished reflecting surface –

   b) An image which can be obtained on a screen –

   c) An image which cannot be obtained on a screen –

   d) A mirror which produces real, inverted and diminished image of a far off object –

   e) A mirror which always produces virtual ,erect and diminished image –

   f) A mirror which always produces virtual, erect and same size object –

2. Solve the crossword below :-

ACROSS

1. Type of lens in which image is always virtual, erect and smaller in size than the object (7)
2. Type of mirror used in dressing table (5)
3. Property where left appears right and right appears left in the image (7, 9)
4. _____ images are always erect (7)
5. Used in rear view mirrors (6)

DOWN

6. Property of light (11,11)
7. _____ images can be obtained on a screen (4)
8. Sunlight is also called _____ _____ (5,5)
9. A disc of seven colours (7,4)
10. Bouncing back of rays of light from a plane, polished surface (10)

				6												
										7						
				1												
8												2			9	
3											10					
	4															
									5							

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?

CHAPTER 15

LIGHT

Activity 2

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 :-

Water: A precious resource

This chapter is done in the EVS class as a hands on activity and is evaluated in EVS only.

Chapter 17

Forests: Our Lifeline

- This chapter would not be evaluated in the exam.
- A kahoot quiz will be conducted in class from this chapter.

Chapter 18

Wastewater Story

- This chapter is covered in by showing presentations in the class.
- The presentations will be followed by a chrome book activity in class.
- This chapter would not be evaluated in the exam.

Projects For First Term

1. **To prepare a presentation for the Chapter - Water : A Precious Resource**

2. **To prepare a assignment for the chapter Winds, storms and cyclones, supported by articles and photos from newspapers and magazines.**
   Aim: To bring awareness among the learners about various natural disasters and their management strategies.
   Resources: www.imd.gov.in/

Projects for Second Term

1. **A case study on the amount of rainfall, level of water table and water management strategies**
   Aim: To make learners aware of the need to conserve water

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
Chlorine	1	Cl^-
Fluorine	1	F^-
Bromine	1	Br^-
Iodine	1	I^-
Nitrate	1	NO_3^-
Nitrite	1	NO_2^-
Hydroxide	1	OH^-
Bicarbonate	1	HCO_3^-
Oxygen	2	O^{2-}
Sulphur	2	S^{2-}
Sulphate	2	SO_4^{2-}
Sulphite	2	SO_3^{2-}
Carbonate	2	CO_3^{2-}
Phosphate	3	PO_4^{3-}
Nitrogen	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) Ferric chloride

g) Cuprous oxide

h) Potassium nitrate

i) Magnesium phosphate

j) Hydrogen sulphide

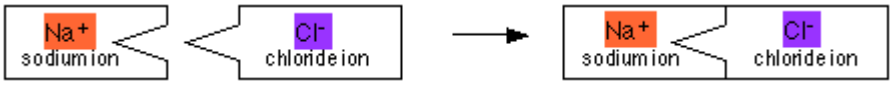
Let us do

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.

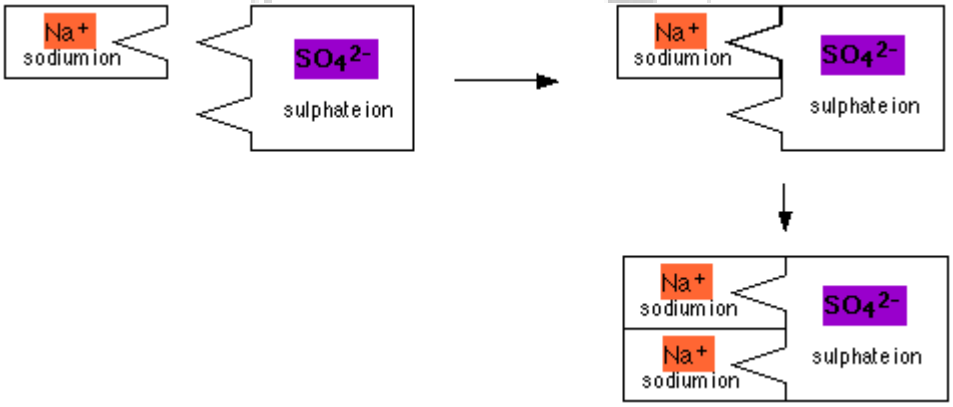
A series of cards representing common anions and cations are used. Each card has both the symbol and name of the ion written on them.

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



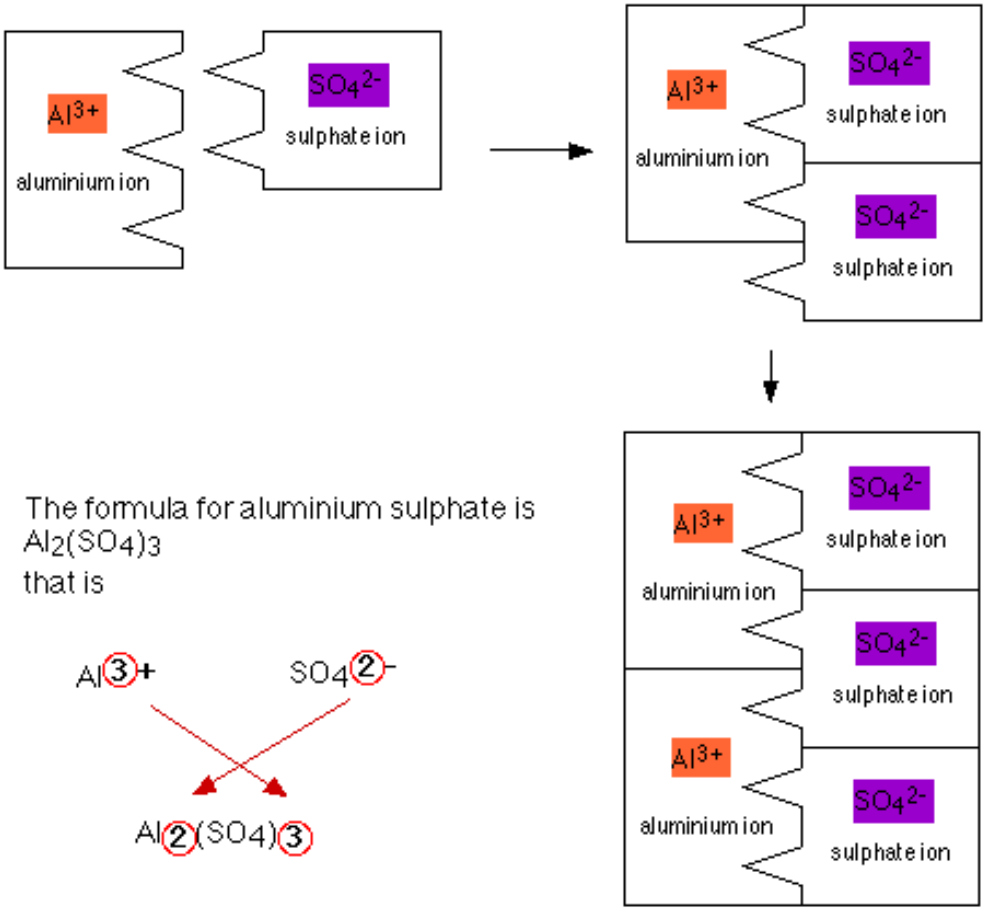
This requires one sodium ion (card) and one chloride ion (card), therefore the formula for sodium chloride is written NaCl.

Similarly for sodium sulphate



This requires two 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 'rule' for writing chemical formulae for themselves.

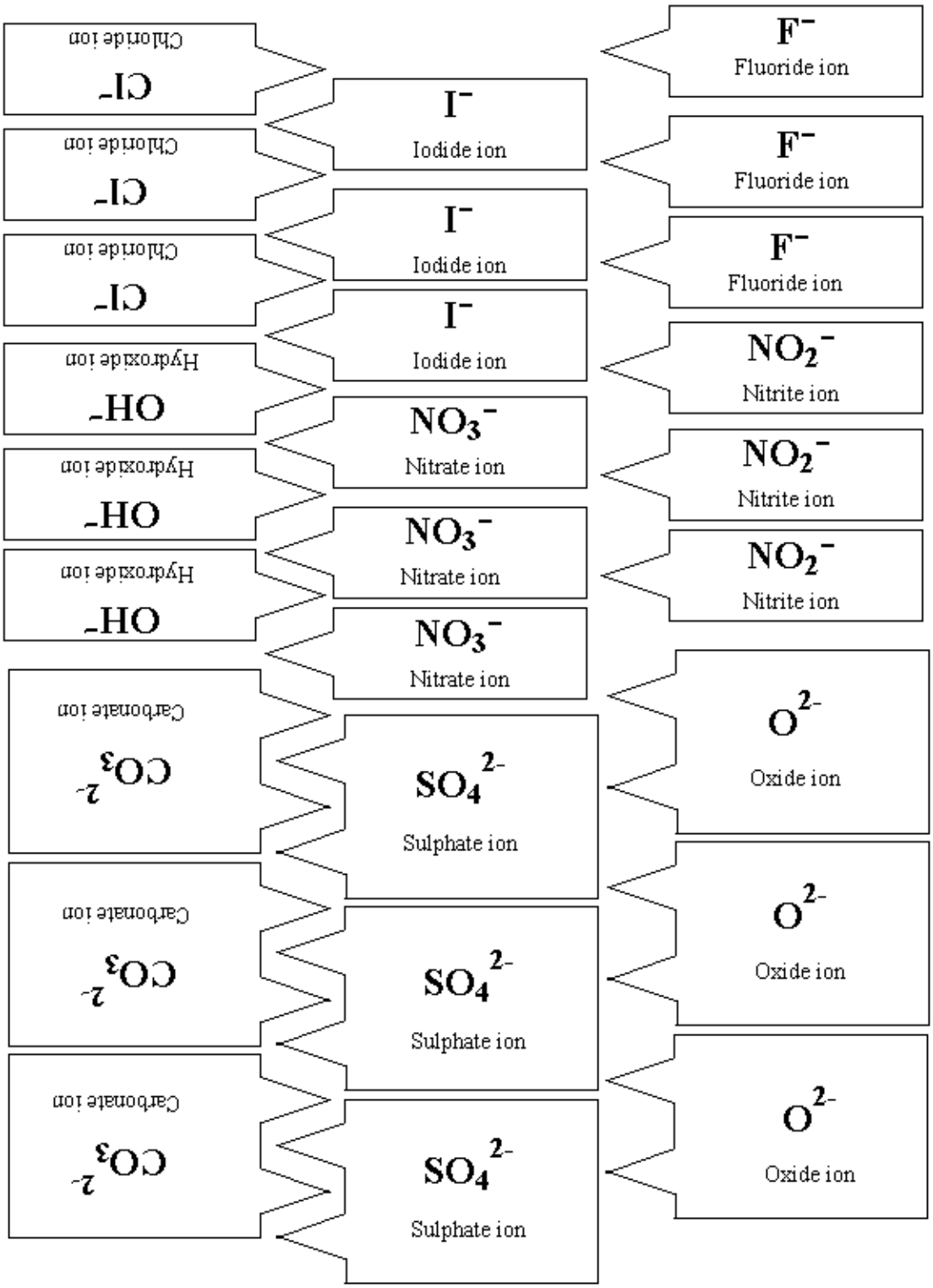


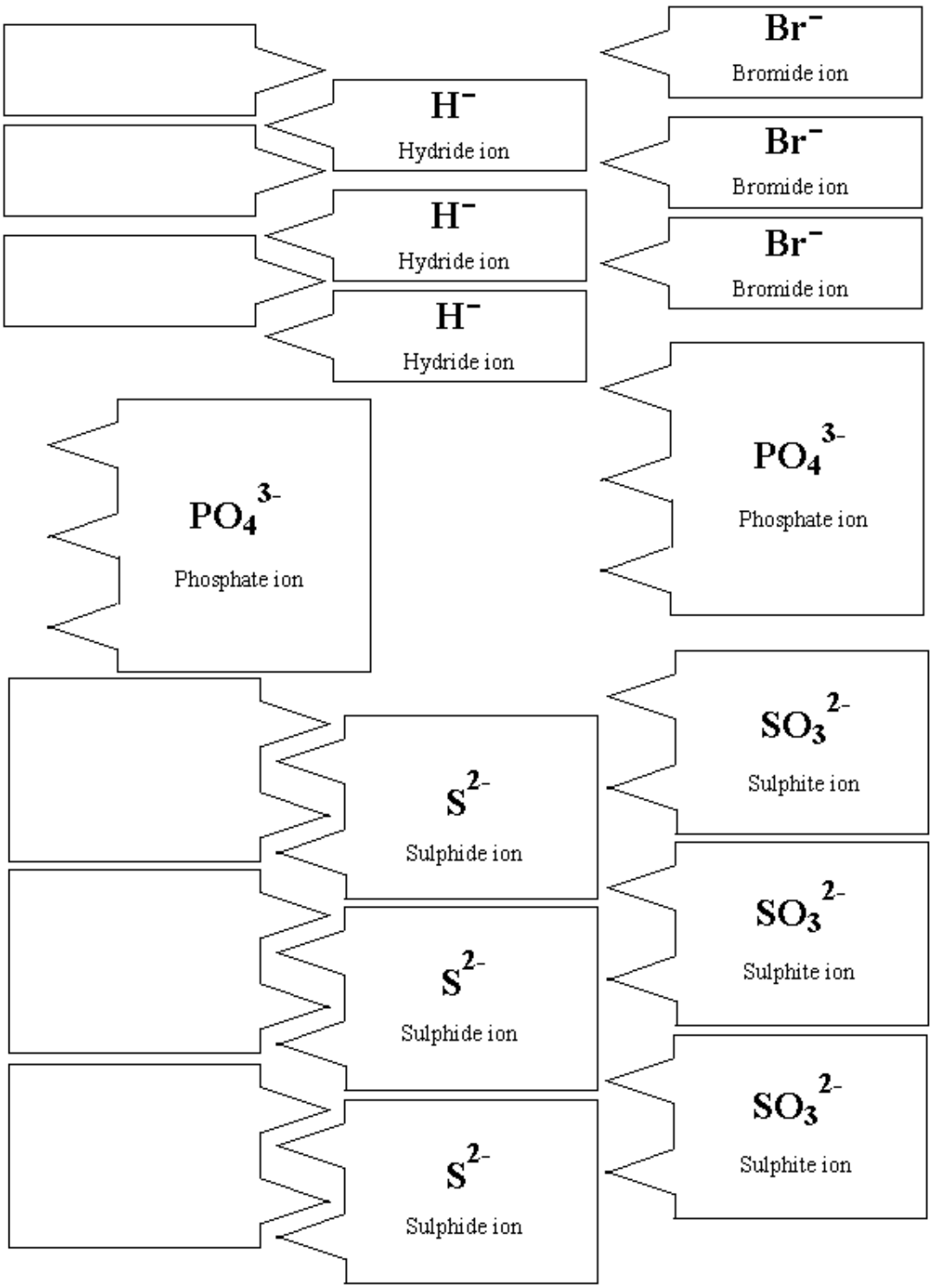
The formula for aluminium sulphate is
$Al_2(SO_4)_3$
that is

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.

Na^+ sodium ion	Li^+ lithium ion	K^+ potassium ion
Na^+ sodium ion	Li^+ lithium ion	K^+ potassium ion
Na^+ sodium ion	Li^+ lithium ion	K^+ potassium ion
NH_4^+ ammonium ion	H^+ hydrogen ion	Ag^+ silver ion
NH_4^+ ammonium ion	H^+ hydrogen ion	Ag^+ silver ion
NH_4^+ ammonium ion	H^+ hydrogen ion	Ag^+ silver ion
Cu^{2+} copper ion	Ca^{2+} calcium ion	Pb^{2+} lead ion
Cu^{2+} copper ion	Ca^{2+} calcium ion	Pb^{2+} lead ion
Cu^{2+} copper ion	Ca^{2+} calcium ion	Pb^{2+} lead ion

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


CO_3^{2-}
Carbonate ion
CO_3^{2-}
Carbonate ion
CO_3^{2-}
Carbonate ion
OH^-
Hydroxide ion
OH^-
Hydroxide ion
OH^-
Hydroxide ion
Cl^-
Chloride ion
Cl^-
Chloride ion
Cl^-
Chloride ion
SO_4^{2-}
Sulphate ion
SO_4^{2-}
Sulphate ion
SO_4^{2-}
Sulphate ion
NO_3^-
Nitrate ion
NO_3^-
Nitrate ion
NO_3^-
Nitrate ion
I^-
Iodide ion
I^-
Iodide ion
I^-
Iodide ion
O^{2-}
Oxide ion
O^{2-}
Oxide ion
O^{2-}
Oxide ion
NO_2^-
Nitrite ion
NO_2^-
Nitrite ion
NO_2^-
Nitrite ion
F^-
Fluoride ion
F^-
Fluoride ion
F^-
Fluoride ion


Br^-
Bromide ion
H^-
Hydride ion
Br^-
Bromide ion
H^-
Hydride ion
Br^-
Bromide ion
H^-
Hydride ion
PO_4^{3-}
Phosphate ion
PO_4^{3-}
Phosphate ion
SO_3^{2-}
Sulphite ion
S^{2-}
Sulphide ion
SO_3^{2-}
Sulphite ion
S^{2-}
Sulphide ion
SO_3^{2-}
Sulphite ion
S^{2-}
Sulphide 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 Ferroussulphate (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) $CuCl_2$
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 I water to form carbonic acid

Answers

a) [redacted]

Reactants _____

Products _____

b)

Reactants

Products

c)

Reactants

Products

d)

Reactants

Products

e) _____

Reactants _____

Products _____

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

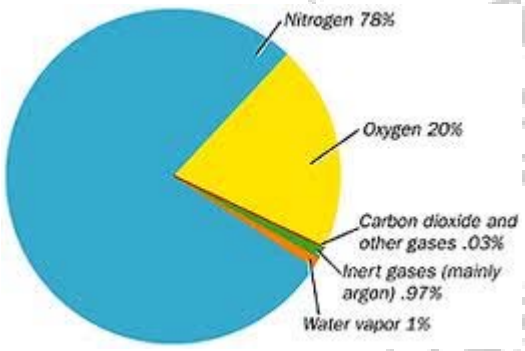
_____1.Gold
_____2.Water
_____3.Seawater
_____4.Sugar
_____5. A chocolate sundae
_____ 6. Air
_____7. Carbon dioxide
_____8. Silver
_____9. Ice
10.Freshly-brewed black coffee

Fun Time with mathematics and science

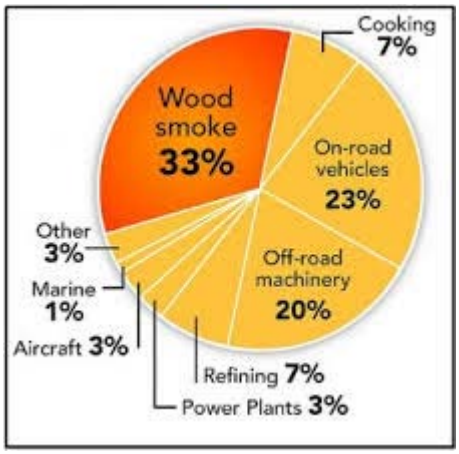
(a)Atmospheric Gases

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
First Term

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
Biology

Q.1. Fill in the blanks:

a. Chlorophyll is a _____coloured pigment.
b. Algae and lichens live in a _____ association.
c. _____ are the type of teeth used for grinding and chewing food.
d. The process of formation of soil is called _____.

Q.2. Choose the correct answer:

a. Plants manufacture food in the form of:
   i. Starch
   ii. Fructose
   iii. Glucose
   iv. Sucrose

b. Soil in which insectivorous plants grow is deficient in:
   i. Nitrogen
   ii. Sulphur
   iii. Phosphorous
   iv. All of the above

c. The largest gland in the human body is:
   i. Pituitary gland
   ii. Liver
   iii. Pancreas
   iv. Adrenal gland

d. In human alimentary canal undigested food is stored in:
   i. Rectum
   ii. Anus
   iii. Small intestine
   iv. Caecum

Q.3. Define photosynthesis. Support your answer with a suitable word equation.

Q.4. Give reasons for the following:

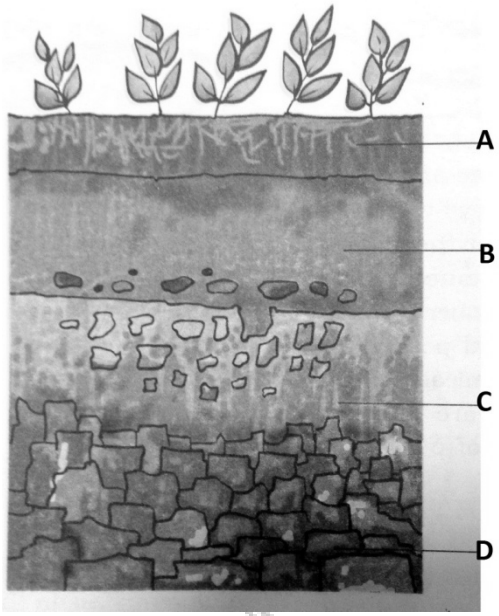
a. Cows can digest cellulose but humans cannot.
b. Gardeners prefer soil with plenty of humus content.

Q.5. a. Give one difference between clayey soil and sandy soil.

b. Name one crop that grows best in loamy soil.

Q.6. Explain the saprotrophic mode of nutrition in fungi.

Q.7. a. Observe the given diagram and label the parts A, B, C and D.



b. In a given soil sample, it took 10 minutes for 200ml of water to percolate. Calculate the rate of percolation in your soil sample.

Q.8. Complete the following table:

Part of alimentary canal	Associated Gland	Secretion	Function
Small intestine	A	Bile	D
	Pancreas	B	E
	Wall of the small intestine	C	F

Q.9. a. Use of plastic bags should be banned completely. Why?

b. Explain the mode of feeding and digestion in *Amoeba*. Support your answer with a well labelled diagram.

Question Bank
Second Term

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

l.	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.

QUESTION BANK

BIOLOGY

Q1. Fill in the blanks:

a) _____ helps in the transport of glucose in plants.
b) _____ is a component of blood which helps in formation of a clot.
c) Circulation in _____ takes place with the help of water.
d) _____ and _____ are eliminated during sweating.
e) Insects have _____ for breathing.
f) Anaerobic respiration of _____ is used in wine and beer making industry.
g) The amount of nitrogen in inhaled and exhaled air is_____
h) Earthworms take in oxygen from their surroundings through_____.

Q2. Name of following :

a. Underground stem with buds
b. Type of reproduction in algae
c. Male organs of a flower
d. Fusion of male and female gamete.

Q3. Differentiate between the following

a. Self and cross pollination
b. Asexual and sexual production
c. Wind and animal dispersed seed.
d. Arteries and Veins.
e. Inhalation and exhalation
f. Anaerobic and aerobic respiration.

Q4. Explain the transport of water and minerals in plants

Q5. Explain the circulation of blood in the human body. Support your answer with a well labelled diagram.

Q6. Give reasons

a. Insects prove very beneficial to flowering plants.
b. Only one plant of mint is required for a garden full of mint.
c. Seeds must go far from the parent plants.

Q7. Explain how the roots of the plants also show respiration. Support your answer with a suitable diagram.

Q8. Draw the diagram of a human respiratory system and label the following in the diagram:

a) Trachea
b) Lungs
c) Alveoli
d) Diaphragm

Q9. Draw the following

a) Pistil
b) Stamen
c) Human excretory system

Holiday Home Work

Physics

"Ashes were already falling, not as yet very thickly. I looked round: a dense black cloud was coming up behind us, spreading over the earth like a flood. 'Let us leave the road while we can still see,' I said, or we shall be knocked down and trampled underfoot in the dark by the crowd behind."- Written by 18 year old to a friend after seeing Mt. Vesuvius erupt on August 24, 79 AD.

Dear Students of Grade 7,

It could be any of us in place of this kid, who was an eye witness to a volcanic eruption. We hear about natural disasters striking Mother Earth without any obvious warnings. Giving a serious thought to natural disasters that can completely turn our lives topsyturvy ,we want you to **choose any one natural disaster** from the following list and work on a special project demonstrating what you have learnt, in a fun and interesting way.

- **Floods**
- **Cyclonic Storms**

PHYSICS PROJECT

Prepare a Handwritten Information booklet consisting of 8 pages(Use A-4 sheets) highlightingpagewise, the following information. The information should be very brief but relevant.

Page 1- Name of the student:

Class and section:

Name of the Natural disaster chosen by you.

Date of submission-

Page 2 - What is a natural disaster- A very brief explanation.

Page 3-What are the main causes of the natural disaster you have chosen?

Page 4- Names of a few places on earth that are vulnerable to the chosen disaster and why these places particularly vulnerable?

Page 5- What are the main effects of the natural disaster you have chosen?

Page 6- Can these disasters be predicted? And, if so how?

Page 7- Make a collage of 4 to 5 pictures related to the disaster.

Page 8- Natural disaster preparedness--- How to prepare for the chosen disaster and what to when they occur.

Evaluation criteria- This is a 10 mark project.

Timely submission- - 2marks

(Date of submission will be announced well in time before the summer holidays begin.)

Overall appeal- 2 marks

Relevance of information on each page- 4 marks

Creativity/overall appeal- 2 marks

HAPPY HOLIDAYS!