

Dawood Public School
Course Outline 2020-21
General Science
Grade VI

Month	Content	Reference Book
August	Introduction to Science	International Lower Secondary Science Book 1 Chapter 01
September	Element and Compound	International Lower Secondary Science Book 2 Chapter 03
	Plant Growth	International Lower Secondary Science Book 1 Chapter 03
October	Forms and Uses Of Energy	Science Matters Vol B Chapter 16
	Habitat and food Chain	International Lower Secondary Science Book 1 Chapter 04
November	Revision for Mid Year Exams	Worksheets
December	MID YEAR EXAMINATION	
January	More about dissolving	International Lower Secondary Science Book 1 Chapter 06
	Microorganisms	International Lower Secondary Science Book 1 Chapter 05
February	How we see things	International Lower Secondary Science Book 1 Chapter 09
	Reversible and Irreversible changes	International Lower Secondary Science Book 1 Chapter 07
March	Physical Quantities and Measurements	International Lower Secondary Science Book 1 Chapter 02
April	Revision for Final Exams	Worksheets
May	FINAL EXAMINATION	



August

Chapter01: Introduction to Science

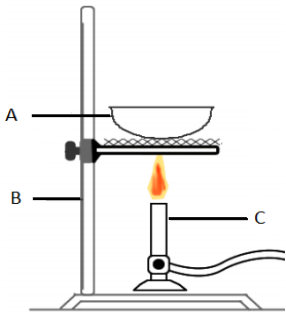
Pages no: 01 - 23

Content	Learning Objectives
<p>What is Science?</p> <p>Science is knowledge about the natural world that is based on facts learned through experiments and observations.</p> <p>Branches of science:</p> <ul style="list-style-type: none">• Biology• Zoology• Physics• Chemistry• Astronomy• Geology• Botany <p>Contribution of scientists:</p> <ul style="list-style-type: none">• Sir Isaac Newton• Mare Curie• Albert Einstein• Louis Pasteur	<ul style="list-style-type: none">• Define science.• List the branches of science.• Define branches of science.• Explain the different aspects of science in daily life.• State the contributions of the following scientists in the field of sciences:<ul style="list-style-type: none">➤ Sir Isaac Newton➤ Mare Curie➤ Albert Einstein➤ Louis Pasteur
<p>Important Attitudes in the Study and Practice of Science</p> <p>Attitudes are concerned with the way which scientific knowledge and its application is evaluated and appreciated.</p> <p>Curiosity, Perseverance, Open-Mindedness, Co-Operation, Integrity, Scepticism and Humbleness.</p>	<ul style="list-style-type: none">• Describe positive attitudes required in the study and practice of science.• Identify the respective attitudes required for the scientific research.• Suggest what may happen to inventions if any one of the required attitude characteristics was absent.
<p>Skills and Processes</p> <p>Skills and processes are essential for the study and practice of science.</p> <p>Skills are:</p> <ul style="list-style-type: none">• Observing• Communicating• Inferring• Making Hypotheses <p>Processes include planning and investigation involving several skills.</p>	<ul style="list-style-type: none">• Define observation.• Define inference.• Define hypotheses.• Differentiate between observation and inference.• Write the hypotheses for observations.• Construct the planning for various given situations.• Investigate different observations of given situations/experiments.• Define fair test.• Identify the constant and change variable of the fair test.• Differentiate between skills and processes in science.• Suggest why skills are important.• Suggest why processes must be carried out meticulously.
<p>Safety Rules in the Laboratory</p> <p>General safety rules and precautions.</p> <p>Hazardous symbols.</p> <ul style="list-style-type: none">• Flammable• Explosive• Corrosive• Poisonous or toxic• Irritating	<ul style="list-style-type: none">• State laboratory safety rules.• State the precautions for handling different experiments in the laboratory.• Recognize symbols of different hazardous substances.• State the proper ways of handling hazardous substances.

<ul style="list-style-type: none">• Radioactive• Biohazardous	
<p>Laboratory Apparatus</p> <p>Apparatus are used for scientific experiments in the laboratory.</p> <p>Following Laboratory apparatus are included:</p> <ul style="list-style-type: none">• Beaker• Flat bottomed flask• Round bottomed flask• measuring cylinder• Pipette• Boiling tube• Conical flask• Burette• Thistle funnel• Filter funnel,• Gas jar• Bell Jar• Evaporating dish• Crucible• Tripod stand• Water trough• Displacement can• Retort stand	<ul style="list-style-type: none">• Identify laboratory apparatus.• Describe the uses of different apparatus used in the laboratory.• Draw the sectional diagram of different laboratory apparatus.
<p>Bunsen Burner</p> <p>Bunsen burner is a laboratory apparatus used for heating.</p> <p>Parts of Bunsen burner include:</p> <ul style="list-style-type: none">• Barrel• Collar• Base• Air hole• Gas jet• Gas tap	<ul style="list-style-type: none">• Identify the parts of Bunsen burner.• State the functions of each part of Bunsen burner.• Define luminous flame.• Define non-luminous flame.• Differentiate between luminous and non-luminous flames.
<p>Benefits, Abuse and Limitations of Science and Technology</p> <p>Technology is the application of science and together science and technology can bring us great benefits. However, abuse of science and technology can cause problem.</p>	<ul style="list-style-type: none">• Define technology.• Differentiate between science and technology.• Describe the uses of various technologies in the branches of science.• Describe some possible abuses of science.• State the limitation in technologies of different branches of science.
<p>Keywords:</p> <p>Science, Biology, Botany, Zoology, Chemistry, Geology, Astronomy, Physics, perseverance, inference, hypotheses, analyses, planning, hazardous substances, luminous flame, non-luminous flame, Bunsen burner</p> <p>Types of Questions:</p> <ul style="list-style-type: none">• Multiple choice questions.• Identification and labelling of diagrams• Structured questions.• Short answer reasoning.• Descriptive questions. <p>Sample Questions:</p> <p>1. State the proper handling of the following Hazardous Symbols.</p>	

Symbol	Name	Proper Handling
		
		

2. A luminous flame is lighted to heat the water as shown below;



- a. Why does apparatus A become black from its base? Support your answer with appropriate reason.
- b. Label the apparatus used in the setup and state their uses.

Label	Name	Use
A		
B		
C		

3. Formulate the inference and hypothesis of the following observations;
- a. Birds look fat during night.
 - b. Unwatered plants die out.
 - c. The sun rises in the east and sets in the west.

Workbook Activities:

- Activity 1.1, 1.2, 1.3 from International Lower Secondary Science Work book 1.

Laboratory Experiments:

- To investigate the need of oxygen during combustion through a fair test.
- To investigate the effect of luminous and non-luminous flame’s heat on evaporation.
- To investigate the difference between the temperature of luminous and non-luminous flame by having a hands on experience of Bunsen burner.

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- <http://techblogbiz.blogspot.com/2006/10/10-great-scientists-of-world.html>
- <http://flamesofchemistry.blogspot.com/2013/11/benefits-abuses-and-limitations-of.html>

Content	Learning Objectives
Atom <ul style="list-style-type: none">• Structure of an atom.• Sub atomic particle• Atomic Number• Atomic Mass• Electronic Configuration	<ul style="list-style-type: none">• Define atom.• Describe the structure of atom.• Draw the structure of atom.• Define sub-atomic particles.• State the position and charges of sub atomic particles.• Calculate the number of electrons, protons and neutrons of an atom.• Define atomic number.• Define atomic mass.• List the first 10 elements of the periodic table.• Define electronic configuration.• Write and draw the electronic configuration of the first 10 elements of the Periodic Table.
What is an element? <p>Element is a substance which cannot be broken down into simpler substances by chemical reactions.</p> <p>Elements are broadly classified in to Metals, Non-metals and Metalloids.</p> <p>Arrangements of the periodic table of the elements.</p> <p>Periodic Tableconsists of rows and columns.</p>	<ul style="list-style-type: none">• Define element.• Learn symbols, atomic number and atomic mass of first 10 elements of the periodic table.• Define metals.• Define non-metals.• Compare the properties of metals, non-metals and metalloids.• Define Periodic Table.• Define periods.• Define groups.• Identify periods and groups of different elements from their electronic configurations.
Uses of Elements <p>Metals.</p> <p>Non-metals.</p>	<ul style="list-style-type: none">• List the properties of metals.• List the properties of non-metals.• Differentiate between metals and non- metals.• State the uses of some elements.
What is compound? <p>Compound is a pure substance consisting of two or more elements which have been chemically combined.</p> <p>Properties of compounds.</p>	<ul style="list-style-type: none">• Define compound.• State the properties of compounds.• Give examples of each of the property of compound.• Recognise the number and type of elements present in a particular compound.• Differentiate between composition and decomposition reaction.• Identify the composition and decomposition reaction by analysing the chemical word equations.• Write chemical word equations of given chemical reactions.

Formation of Compounds
Reaction of one element with another element to produce a new compound.
Reaction of one element with a compound to produce a new compound
Reaction of one compound with another compound to produce new compounds.

- Describe various ways of compound formation and give examples of each.
 - Compound formation by reaction between element and compound.
 - Compound formation by reaction between element and element.
 - Compound formation by reaction between compound and compound.

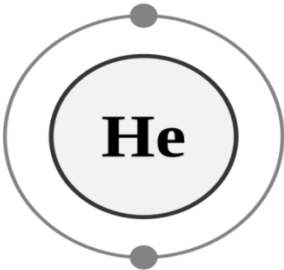
Keywords:
atom, electron, protons, neutrons, orbits/shells, atomic number, atomic mass, element, metals, non-metals, groups, periods , periodic table, brittle, conductor, insulator, ductile, malleable, compound, composition reaction, decomposition reaction

Types of Questions:

- Multiple choice questions
- Identification and labelling of diagrams
- Structured questions
- Short answer reasoning
- Descriptive questions

Sample Questions:

1. What is the correct position of the element shown below in the periodic table?



A. 1st Period, Group II

B. 2nd Period, Group I

C. 1st Period, Group VIII

D. 8th Period, Group I

2. State the location of the elements with the help of their electronic configuration.

S. No.	Electronic configuration	Period No.	Group No.
1.	2, 8, 6		
2.	2,8,1		
3.	2,8,7		
4.	2,8,8		
5.	2,8,3		
6.	2		
7.	2,5		
8.	2,8,2		
9.		3 rd	IV
10.		1 st	I

3. Compare three characteristics of Metals, Non-metals and Metalloids.

Metals	Metalloids	Non-metals

Workbook activities:

- Activity 3.1, 3.2, 3.3 from International Lower Secondary Science Work book 2.

Activities:

- Visit of the Periodic table at school.
- Comparing the properties of metals and non-metals.

Laboratory Experiments:

- To examine the formation of a compound by reaction of element and element.
- To examine the formation of a compound by reaction of element and compound.
- To examine the formation of a compound by reaction of compound and compound.

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- <https://www.youtube.com/watch?v=EMDrb2LqL7E>
- <https://quizlet.com/3488993/common-elements-and-their-uses-flash-cards/>

Chapter 03: Plant Growth

Pages no: 53 - 68

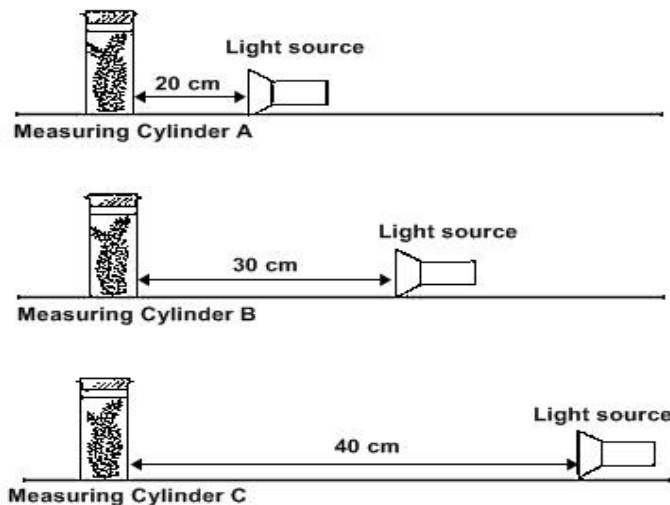
Content	Learning Objectives
What do plants need to grow well? Photosynthesis is the fundamental process by which plants manufacture carbohydrates from raw materials Plant’s adaptations for photosynthesis.	<ul style="list-style-type: none">Define photosynthesis.State the equation for photosynthesis.Describe the process of photosynthesis.List the raw materials needed for the process of photosynthesis.Describe the role of roots in the absorption of water and mineral salts.State the position and function of stomata.Identify the gases coming out and going in through stomata during the day and night.Explain the importance of photosynthesis.Suggest why glucose is converted into starch.
Plants and Nutrients Plant get nutrients by different ways: <ul style="list-style-type: none">➤ Air (aeroponics)➤ Water (hydroponics)➤ Soil➤ By attacking the other insects (insectivorous plants) Soil and soil types on the basis of texture, size of particles and presence of water and air content <ul style="list-style-type: none">➤ Loamy➤ Clayey➤ Sandy Fertilizers and types of fertilizers <ul style="list-style-type: none">➤ Organic fertilizer➤ Inorganic fertilizer	<ul style="list-style-type: none">Define insectivorous plants.Define hydroponics.Define aeroponics.Identify and list the different types of soils.Describe the features of each type of soil.Explain the relationship between soil conditions and plant growth.List the different soil conditions which may affect plant growth.Define organic fertilizers.Define inorganic fertilizers.Compare the characteristics of organic and inorganic fertilizers.Explain the role of fertilizers in plant growth.State how plants depend on fertilizers for getting necessary minerals.
Keywords: photosynthesis, chlorophyll, chloroplast, stomata, starch, variegated leaf, iodine solution, ethanol, insectivorous, hydroponics, aeroponics, clayey, sandy, loamy, organic fertilizers, inorganic fertilizers	

Types of questions:

- Multiple choice questions
- Identification and labelling of diagrams
- Structured questions
- Short answer reasoning
- Descriptive questions

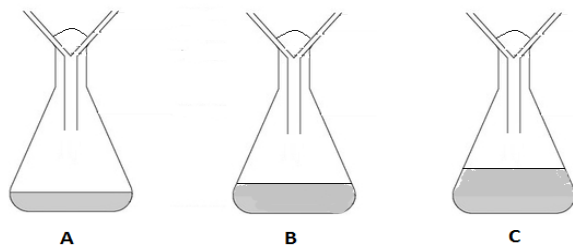
Sample Questions:

1. Harry wanted to investigate how light intensity affects the rate of photosynthesis of a fully-submerged aquatic plant, Elodea. He placed two Elodea in each of the three measuring cylinders containing an identical amount of water as shown in the diagrams below. The set-ups were placed in a pitch dark room.



Arrange the measuring cylinders in ascending order with respect to the amount of oxygen found in it.

- A. B, A, C
 - B. A, B, C
 - C. C, A, B
 - D. C, B, A
2. Same amount of water was added to the three types of soil particles. After filtration of the three soil suspensions following results were obtained.



a. Identify the three soils by observing the result and complete the table given below.

Type of soil	Particle size	Temperature	Humidity	Mineral content
A.				
B.				
C.				

b. State the effect of particle size of soil on the temperature of the soil.

c. Why does loamy soil facilitate the growth of the plant?

d. Why is clayey soil used as mud masks?

3. Humus is an organic fertilizer that makes loamy soil fertile. Explain this statement.

Workbook activities:

- Activity 3.1, 3.2, 3.3 from International Lower Secondary Science Work book 2.

Activities:

- Visit of the Periodic table at school.
- Comparing the properties of metals and non-metals.

Laboratory Experiments:

- To perform a chemical reaction to form a new chemical compound called iron sulphide by combining iron and Sulphur powder.
- To perform a decomposition reaction by heating ammonium dichromate.
- To test the presence of starch in a green leaf.
- To investigate the production of gas during photosynthesis.

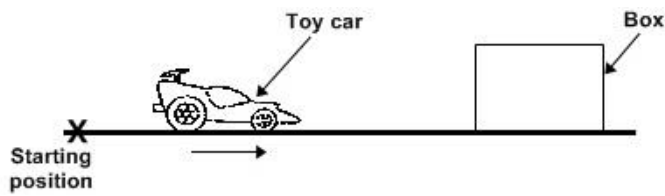
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- <https://www.youtube.com/watch?v=EMDrb2LqL7E>
- <https://quizlet.com/3488993/common-elements-and-their-uses-flash-cards/>

Content	Learning Objectives
What is energy? Energy is the ability to do work. Types of energy; <ul style="list-style-type: none">Kinetic energyPotential energy Forms of energy; <ul style="list-style-type: none">HeatSoundLightElectricalMechanicalChemical	<ul style="list-style-type: none">Define energy.List the types of energy.Differentiate between kinetic energy and potential energy.Provide examples for kinetic energy.Provide examples for potential energy.List the different forms of energy.Define the different forms of energy.Identify the different forms of energy in a given list of objects.Describe the effects of potential and kinetic energy.
Energy transformation Energy can neither be created nor destroyed but can be transformed from one type to another.	<ul style="list-style-type: none">Describe how energy transforms from one form to another.Give various examples of different objects transforming energy.Identify the energy transformation in a given list of different objects.
Energy Conservation Energy conservation is the effort made to reduce the consumption of energy by using less of an energy service.	<ul style="list-style-type: none">Describe why energy conservation is important.State what is an energy service?List some possible ways to conserve energy.
Keywords: energy, kinetic energy, potential energy, heat energy, sound energy, light energy, electrical energy, mechanical energy and chemical energy Types of Questions <ul style="list-style-type: none">Multiple choice questions.Identification and labelling of diagramsStructured questions.Short answer reasoning.Descriptive questions.	

Sample Questions:





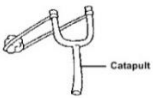
1. A wound-up toy car which was released from the starting position raced across the ground and hits a box in its path. The toy car stopped in its track but the box moved a short distance away.



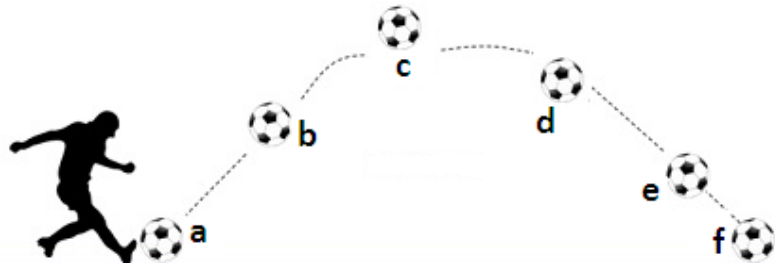
Which of the following shows the conversion of energy that took place in this experiment?

- a. Elastic Potential Energy of Car ---> Kinetic Energy of Car ---> Kinetic Energy of Box
- b. Elastic Potential Energy of Car ---> Sound Energy ---> Chemical Potential Energy of Car ---> Kinetic Energy of Box
- c. Chemical Potential Energy of Car ---> Kinetic Energy of Car ---> Potential Energy of Box
- d. Chemical Potential Energy of Car ---> Sound Energy ---> Kinetic Energy of Car ---> Kinetic Energy of Box

2. Identify the transformation of energy in the following objects.

Object	Energy Transformation
 Batteries	
 Hair Dryer	
 Bicycle	
 Bell	
 Catapult	

3. The picture below shows a footballer kicking a football to the goal post.



- i. Which point shows the ball having highest kinetic energy?

- ii. Which point shows the ball having highest potential energy?

- iii. Which point shows the ball having lowest kinetic energy?

- iv. Which point shows the ball having lowest potential energy?

- v. How can you increase kinetic energy?

vi. How can you increase potential energy?
<hr/>
Activities: <ul style="list-style-type: none">• Observation of different objects that demonstrate the different forms of energies.• Observation of simple harmonic motion of a pendulum.
Laboratory Experiments: <ul style="list-style-type: none">• To investigate the transformation of electrical energy into light and sound energy through circuit.• To investigate the conversion of chemical energy into electrical energy.
Surf IT <ul style="list-style-type: none">• https://www.thoughtco.com/main-energy-forms-and-examples-609254• http://study.com/academy/lesson/energy-transformation-definition-types-examples.html

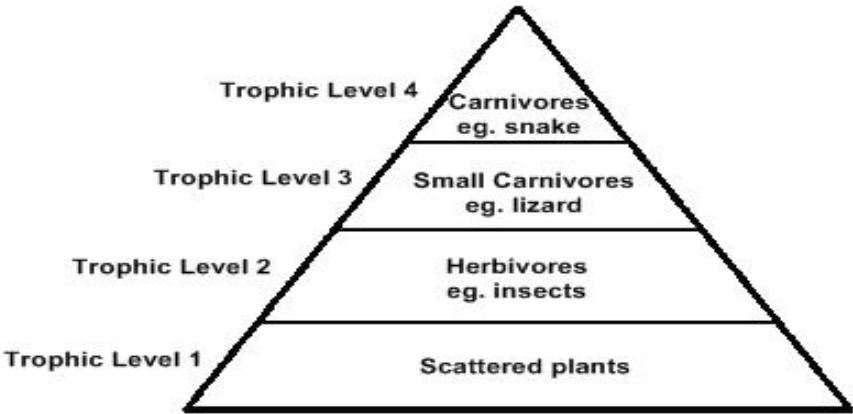
Chapter 04: Habitat and Food Chains		Pages no: 69 - 92
Content	Learning Objectives	
Habitats Habitat is a place where living organism find food, shelter, protection and mates.	<ul style="list-style-type: none">• Define habitat.• Identify different components of habitat.• Enlist different habitats found on the earth.• Define flora.• Define fauna.• Name floras and faunas of different habitats.	
The animals and plants in a habitat are interdependent Animals depend on plants for food, oxygen and shelter. Whereas plants depend on animals for dispersal of seed and for carbon dioxide as a source of nutrients in soil after decomposition.	<ul style="list-style-type: none">• Describe how plants and animals are interdependent on each other.• Define pollination.• Define seed dispersal.• Define decomposition.• Define decomposers.	
Animals and plants in a habitat are suited to their environment. Adaptations to survive at low temperature. Adaptations for light. Adaptations to move in water. Adaptations to breathe in water. Adaptation to survive in desert condition. Adaptations for water retention in desert.	<ul style="list-style-type: none">• Define adaptation.• Explain the importance of adaptation of organisms for survival in its different habitats.• Describe the adaptations of organisms (plant and animals) required to survive in low temperature.• Describe the adaptations of organisms (plant and animals) required to get light.• Describe the adaptations of animals required to move in water.• Describe the adaptations of animals required to breathe under water.• Describe the adaptation of organism (plant and animals) required to survive against desert conditions.• Give examples of organisms for each of adaptation.	
Food Chain Definitions Trophic level: <ul style="list-style-type: none">• Primary consumer• Secondary consumer• Tertiary consumer Food chains	<ul style="list-style-type: none">• Define food chain.• Explain how energy is transferred from one organism to another.• Define producer.• Define consumers.• Identify producers in a given food chain.	

Food web	<ul style="list-style-type: none">• Identify consumers in a given food chain.• Define the following types of consumers:<ul style="list-style-type: none">➤ herbivores➤ carnivores➤ omnivores• Define food web.• Describe trophic levels.• Identify primary consumers in a given food web.• Identify secondary consumers in a given food web.• Identify tertiary consumers in a given food web.• Define prey.• Define predator.• Describe the predator-prey relationship.• Construct a food chain of a particular habitat.• Identify the number of food chains in a given food web.
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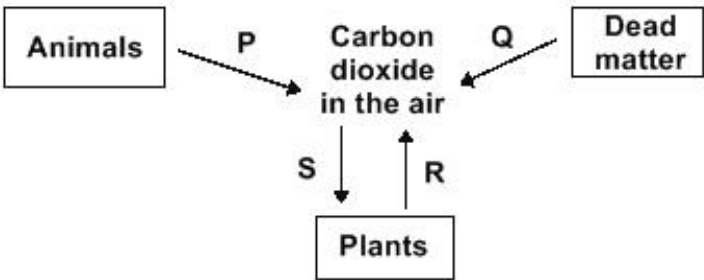
Keywords:
habitat, pollination, dispersal of seeds, decomposers, fungi, bacteria, adaptation, clasping roots, tendrils, nocturnal animals , succulent roots, carnivore, trophic level, food chain, food web, producer, consumer, prey, predator, herbivore, omnivore, primary consumer, secondary consumer, tertiary consumer

- Types of Questions:**
- Multiple choice questions
 - Identification and labelling of diagrams
 - Structured questions
 - Short answer reasoning
 - Descriptive questions

- Sample Questions:**
1. The diagram below shows the ecological pyramid found in a hot desert in which the energy flow from one level to the next and the number of organisms in each trophic level are graphically represented.



- In which trophic level will be the organism is less likely to survive if the desert gets less rain and the conditions are harsher?
- A. Trophic level 1
 - B. Trophic level 2
 - C. Trophic level 3
 - D. Trophic level 4
2. The diagram below shows how carbon dioxide is removed from or released to the surrounding air during the processes, P, Q, R and S.



a) Identify the processes.

P = _____

Q = _____

R = _____

S = _____

b) State importance of the following processes.

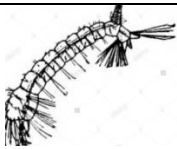



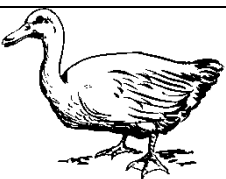
P = _____

Q = _____

R = _____

S = _____

3. Identify the adaptations and state how these adaptations are helpful for the organisms.

Adaptations	How these adaptations enable the organisms to survive in its habitat?
 Breathing tube of Insects.	<div></div> <div></div> <div></div> <div></div>
 Owls have big round eyes.	<div></div> <div></div> <div></div> <div></div>
 Sharp Claws of Eagle	<div></div> <div></div> <div></div> <div></div>
 Flippers of penguins	<div></div> <div></div> <div></div> <div></div>
 Webbed feet of ducks	<div></div> <div></div> <div></div> <div></div>

Workbook activities:

- Activity 4.1, 4.3, 4.4, 4.5, 4.6 from International Lower Secondary Science Work book 1.

Activities:

- Survey to the different areas of the school to discover different habitats and its flora and fauna.

Laboratory Experiments:

- To design a sustainable environment for healthy growth of plants by using the given resources. (soil, seeds, plastic bottle, water, paper cups, thread, thread, gauze sheet)

Surf IT:

- <https://www.slideshare.net/davmfoster/habitats-and-foodchains-46127088>

November**Revision for Mid-Year Examination****December****Mid-Year Examination****January****Chapter 06: More about Dissolving****Pages no: 114 - 123**

Content	Learning Objectives
Do all solids dissolve in water? Solute is a substance that dissolves in a liquid. For example sugar, salt etc. Solvent is a substance in which another substance is dissolved to form a solution. For example water is a universal solvent. A solution is a mixture containing one or more dissolved substances in a liquid. A suspension is a substance containing one or more insoluble solids in a liquid.	<ul style="list-style-type: none"> • Define solute. • Define solvent. • Define solution. • Define suspension. • Differentiate between solution and suspension. • Define saturated solution. • Define supersaturated solution. • Differentiate between a saturated solution and a supersaturated solution.
Separating an insoluble solid from water. Filtration is a process of separating insoluble solids from fluids. Insoluble solids are the substances that cannot dissolve in the solvent. Large particles of solid can easily be separated from water by using a sieve. The size of particles must be bigger than the pore size of sieve.	<ul style="list-style-type: none"> • Define filtration. • Define soluble substances. • Give examples of the soluble substances. • Describe the process of filtration. • Describe the relation of pore size of sieve and the particle size of solute during separation of insoluble particles from water.
Separating a soluble solid from water. Evaporation is defined as a process of a liquid changing into a gas due to an increase in temperature. Soluble solids can be separated from water by evaporation. Soluble solids are the substances that can dissolve in the solvent.	<ul style="list-style-type: none"> • Define soluble substances. • Give examples of the soluble substances. • Define evaporation. • Explain how soluble substances can be separated from water.
Investigating how solids can dissolve more quickly in water. Various factors affect the rate dissolving such as temperature, surface area, rate of stirring etc. These factors could be changed to enhance the rate of dissolving of solute in the solvent. For example sugar dissolves more quickly in warm water than in cold water.	<ul style="list-style-type: none"> • Describe the factors that affect rate of dissolving. • Describe the effect of change in factors on the rate of dissolving. • Describe the rate of stirring affects the rate of dissolving.

Keywords:

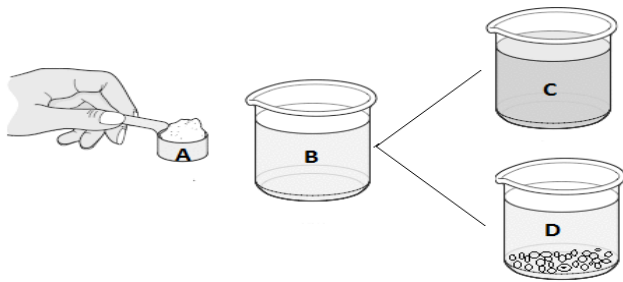
solute, solvent, solution, suspension, universal solvent, soluble, insoluble, filtration, filtrate, residue, filter paper, evaporation, evaporating dish, Bunsen burner, tripod stand, dissolving, rate, factors, stirring, temperature, surface area

Types of Questions:

- Multiple choice questions
- Identification and labelling of diagrams
- Structured questions
- Short answer reasoning
- Descriptive questions

Sample Questions:

1. Identify and define the terms.



	Label	Definition
A		
B		
C		
D		

2. Which of the following substances, when mixed with the water would make solution? Encircle the substances that would make a solution.

- I. Rice II. Coffee III. Sand IV. Salt
- V. Sugar VI. Flour VII. Beans VIII. Powder

3. Differentiate between filtration and evaporation.

Workbook activities:

- Activity 6.1, 6.2, 6.3, 6.4, 6.5, 6.6 from International Lower Secondary Science Work book 1

Laboratory Experiments:

- To investigate the solubility of the following different substances/solutes and examine the dissolving capability of water:
 - sugar
 - pepper
 - chalk
 - baking soda
 - detergent
 - salt
- To separate the mixture of sand or tea leaves and water through the process of filtration.
- To evaluate the rate of dissolving capability of solutes(salt/sugar) in hot and cold water.
- To separate out the soluble substances from water through evaporation.
- To make a super saturated solution of Copper Sulphate/Sugar and water.

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- <https://www.abpischools.org.uk/public/documents/legacy/solids-liquids-gases/morediss.pdf>
- <http://k8schoollessons.com/dissolving-more-dissolving-faster/>

Chapter 05: Micro-organisms

Pages no: 93 - 113

Content	Learning Objectives
What is Cell? Cell is the basic structural and functional unit of life. Cell is composed of: <ul style="list-style-type: none"> • Cell wall • Cell membrane • Cytoplasm • Nucleus • Vacuole • Chloroplast • Cell can be observe by microscope Microscope is the instrument use to observe cells Parts of microscope: <ul style="list-style-type: none"> • Eye piece • Stage • Objective lens • Focus knob 	<ul style="list-style-type: none"> • Define cell. • Describe the structure of cell. • Describe the function of the following: <ul style="list-style-type: none"> ➤ cell wall ➤ cell membrane ➤ cytoplasm ➤ nucleus ➤ vacuole ➤ chloroplast • Identify the cell organelles. • Define microscope. • Describe the benefits of a microscope to science. • Identify the different parts of microscope. • State the functions of the parts of microscope.
Types of Cell Unicellular (single celled organism) e.g. bacteria Multicellular (organism composed of more than one cell) e.g. plants and animals A prokaryote is a unicellular organism that lacks a membrane-bound nucleus. e.g. bacteria A eukaryote is an organism that has true (membrane-bound) nucleus. E.g. plant and animal cells. Cell can be divided into animal and plant cell.	<ul style="list-style-type: none"> • Define unicellular. • Define multicellular. • Differentiate between unicellular and multicellular. • Define prokaryote. • Define eukaryote. • Differentiate between prokaryotes and eukaryotes. • Differentiate between animal and plant cells. • Identify the parts of animal and plant cells. • Draw animal and plant cells.
What are Micro-organisms Microorganisms are the organism which cannot be seen by unaided eye, which may be single-celled or multicellular. Single cell microorganisms are bacteria, virus and fungi (i.e. yeast). Multicellular microorganisms are fungi (moulds, mushrooms) and algae. Shapes of bacteria (cocci, spirilli and bacilli)	<ul style="list-style-type: none"> • Define microorganisms. • Name some disease causing microorganisms. • Describe the shapes of bacteria. • State structural characteristics of micro-organisms.
Nutrition in micro organisms Ways of obtaining food and nutrients are: <ul style="list-style-type: none"> • Make on their own (Cyanobacteria) • By decomposition (Decomposers) • Get nutrient from host (Parasitic) 	<ul style="list-style-type: none"> • Describe the ways by which micro-organisms obtain food and nutrients.

<p>Diseases and its types</p> <p>Disease can be caused by germs. These are known as causative agents or pathogens.</p> <p>Vector is an organism that does not cause disease itself but which spreads infection by conveying pathogens.</p> <p>Disease can be caused by bacteria, viruses and fungi and protozoans (amoeba, plasmodium)</p> <p>Types of disease</p> <ul style="list-style-type: none"> • Water-borne • Food-borne • Air-borne 	<ul style="list-style-type: none"> • Define causative agents/pathogens. • Define vector. • Describe the following of diseases; <ul style="list-style-type: none"> ➤ food- borne ➤ water-borne ➤ air-borne • Give examples of food-borne, water-borne and air-borne disease. • State the preventions from food-borne, water-borne and air-borne diseases.
<p>Diseases caused by viruses</p> <p>Diseases that are caused by viruses are known as viral diseases.</p> <p>Viral disease include:</p> <ul style="list-style-type: none"> • Cold • Influenza • Measles • Mumps • Rubella • Small pox • Chicken pox • Hepatitis • Hand, foot and mouth disease • AIDS <p>Viral disease can be treated by antiviral medicines.</p> <p>Vaccines can help prevent from many viral diseases.</p>	<ul style="list-style-type: none"> • List and identify the viral diseases. • Describe the mode of transmission of different viral diseases (of food-borne, water-borne and air-borne disease). • Describe the symptoms of: <ul style="list-style-type: none"> ➤ Cold ➤ Influenza ➤ Measles ➤ Mumps ➤ Rubella ➤ Small pox ➤ Chicken pox ➤ Hepatitis ➤ Hand, foot and mouth disease ➤ AIDS • Define vaccination/vaccines. • Describe the formulation of vaccines.
<p>Diseases caused by bacteria</p> <p>Diseases that are caused by bacteria are known as bacterial diseases. Bacterial disease include:</p> <ul style="list-style-type: none"> • Cholera • Pneumonia • Tuberculosis • Typhoid • Whooping cough • Tooth decay/gum disease • Food poisoning <p>Bacterial disease can be treated by antibiotics</p>	<ul style="list-style-type: none"> • List and identify bacterial diseases. • Describe the mode of transmission of different bacterial diseases. • Describe the symptoms of: <ul style="list-style-type: none"> ➤ Cholera ➤ Pneumonia ➤ Tuberculosis ➤ Typhoid ➤ Whooping cough ➤ Tooth decay/gum disease. • Describe the treatment/cure of bacterial diseases. • Compare the following terms: <ul style="list-style-type: none"> ➤ prevention ➤ treatment ➤ cure
<p>Diseases caused by fungi and protozoa</p> <p>Diseases that are caused by fungi are known as fungal disease.</p> <p>Fungal diseases include Athletes Foot.</p> <p>These diseases can be treated by anti-fungal medicines and ointments.</p> <p>Protozoa cause malaria; can be transmitted by vector (anopheles mosquito).</p>	<ul style="list-style-type: none"> • List and identify fungal diseases. • Describe the symptoms of Athletes Foot. • Describe the cure for Athletes Foot. • Identify and name protozoan diseases. • Describe the disease malaria, its symptoms, prevention, treatment and cure.

Micro-organisms and food Spoilage

Microorganisms are harmful as well as useful.
Bacteria and fungi can be harmful as they cause disease and spoilage of food.
Bacteria and fungi are helpful in the production of food and medicines.
Bacteria and fungi play a vital role in making the environment clean and green. They are natural decomposers and convert complex food into simpler nutrients. They increase the fertility of soil and support plant growth.

- Differentiate between the harmful and useful effects of micro-organisms.
- Define decomposition.
- Define decomposers.
- Define fermentation.
- Describe the role of decomposers.
- Describe how food storage can be handled with care to prevent food decay and food poisoning.
- Describe the process of bread making.

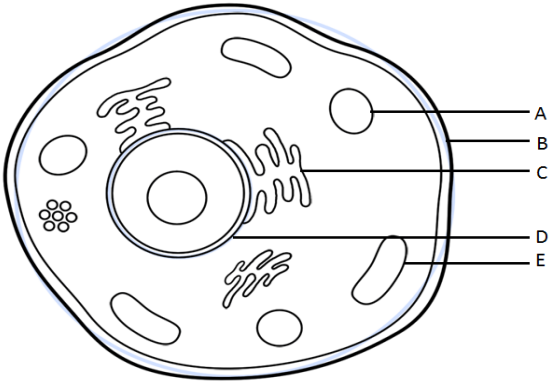
Keywords:
cell, cytoplasm, nucleus, cell membrane, chloroplast, cell wall, vacuole, unicellular, multicellular, prokaryote, eukaryote, plant cell, animal cell, microorganisms, bacteria, fungi, viruses, diseases, vectors, food-borne, water borne, air- borne, infections, causative agent, pathogens, decomposers, vaccination

Types of Questions:

- Multiple choice questions
- Identification and labelling of diagrams
- Structured questions
- Short answer reasoning
- Descriptive questions

Sample Questions:

1. Define cell and differentiate between prokaryotic and eukaryotic cell.
2. Describe the symptoms of the following diseases;
 - Typhoid
 - Athlete foot
 - Measles
3. Label the cell organelles and state their functions



Label	Name	Function
A		
B		
C		
D		
E		

Workbook activities:

- Activity 5.1, 5.2, 5.3 from International Lower Secondary Science Work book 1.

Activities:

- To observe the slides of unicellular organisms (Amoeba, Euglena and Paramecium).

- Observation of the microscope and its different parts.

Laboratory Experiments:

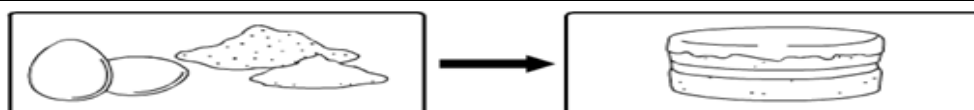
- To set-up a slide on microscope.
- To investigate the structure of the animal and plant cell by slide preparation.

Surf IT:

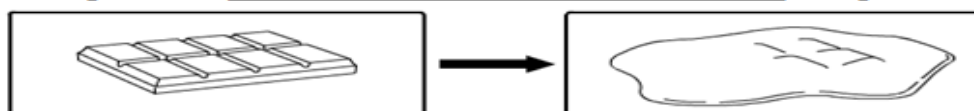
- <http://www.smartsciencepro.com/classification-microorganisms/>
- <https://www.pmfias.com/diseases-caused-by-microorganisms-microbes-bacteria-viruses-protozoans-fungi/>

February
Chapter07: Reversible and Irreversible Changes
Pages no: 124 - 134

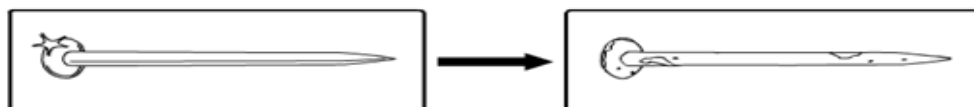
Content	Learning Objectives
Reversible and Irreversible change. Reversible change is a change in which final substance can be converted back into the original substance without creating new materials. Irreversible change is a change which cannot be reversed or is not easily reversible because new materials are formed. Physical changes are reversible. Chemical changes are irreversible.	<ul style="list-style-type: none"> • Define matter. • Compare the characteristics of three states of matter. • Define reversible change. • Define irreversible change. • Differentiate between reversible and irreversible changes. • Explain physical change with examples. • Explain chemical change with examples.
Changes brought by heating. Heating or cooling can cause materials to change. Heat gain can bring about changes of state such as melting, boiling and evaporation. Heat loss or cooling can change a liquid into solid, and a gas into liquid. These are reversible changes.	<ul style="list-style-type: none"> • Describe the effect of increasing and decreasing temperature on different substances. • Describe the effect of heating on different substances. • Describe how heat can cause both reversible and irreversible changes.
Burning – An irreversible change brought about by heat. When a material burns, it combines with oxygen in the air to make new materials. Burning is an irreversible change caused by heat. Heating substances like sugar and eggs, cooking or baking are all irreversible changes because new materials are formed that cannot return to an original condition.	<ul style="list-style-type: none"> • Recognize the reversible or irreversible change by analysing different changes caused by heating. • Illustrate the burning of the following different substances: <ul style="list-style-type: none"> ➤ sparkler ➤ paper ➤ wood ➤ cooking gas
Keywords: reversible, irreversible, sublimation, vaporization, condensation, fusion, melting, freezing, decomposition, baking, cooking, burning, cooking gas	
Types of Questions: <ul style="list-style-type: none"> • Multiple choice questions • Identification and labelling of diagrams • Structured questions • Short answer reasoning • Descriptive questions 	
Sample Questions: 1. Fill the blanks.	



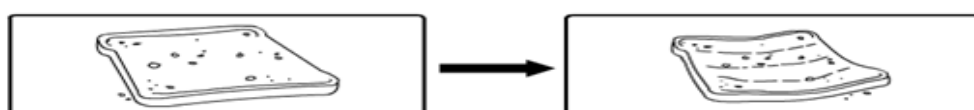
Baking cake is a _____ change.



Melting chocolate is a _____ change.



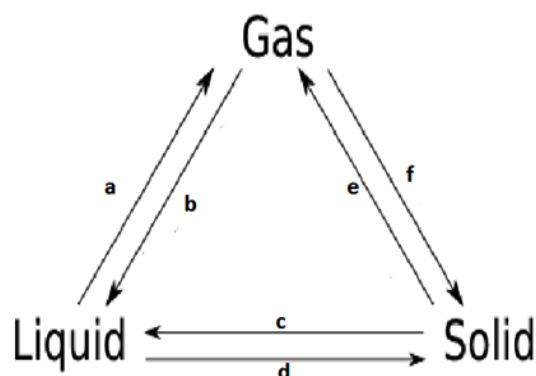
A nail rusting is a _____ change.



Toasting bread is a _____ change.

2. Distinguish between temporary and permanent change.

3. Name the following reversible changes occurring in the three states of matter.



A :	B :
C :	D :
E :	F :

Workbook activities:

- Activity 7.1, 7.2 and 7.3 from International Lower Secondary Science Work book 1.

Activities:

- Demonstration of the examples of reversible and irreversible changes (Melting, Evaporation, Burning, Rusting)

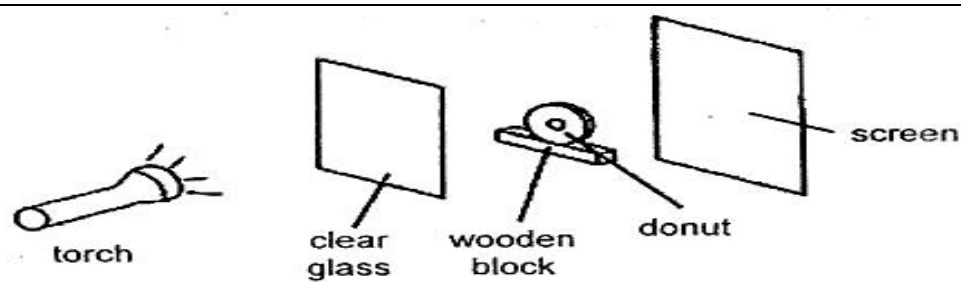
Laboratory Experiments:

- To examine the reversible and irreversible changes.

Surf IT:

- https://www.youtube.com/watch?v=mFGv_d6h45U
- http://www.bbc.co.uk/bitesize/ks2/science/materials/reversible_irreversible_changes/read/
- <http://www.sciencekids.co.nz/gamesactivities/reversiblechanges.html>

Content	Learning Objectives
Sources of light Luminous objects. Non-luminous objects.	<ul style="list-style-type: none">• Define light.• Define luminous objects.• Define non-luminous objects.• Differentiate between natural and artificial sources of light.• List some natural sources of light.• List some artificial sources of light.
Reflection of Light Law of Reflection	<ul style="list-style-type: none">• Define reflection of light.• Define refraction of light.• Distinguish between reflection and reflection.• Identify the various materials which reflect or refract light.• Define angle of incidence.• Define angle of reflection.• Define normal.• State law of reflection.
Can We See through all materials? Transparent objects. Translucent objects. Opaque objects.	<ul style="list-style-type: none">• Describe the relationships between light and materials.• Define translucent material.• Define transparent material.• Define opaque material.• Identify transparent, translucent and opaque objects.• Give examples of transparent, translucent and opaque objects.
Shadows Why are shadows formed? Shape of a shadow. Change in the length and position of a shadow.	<ul style="list-style-type: none">• Define shadow.• Describe shadow formation.• Describe and identify directions of shadow due to the movement of light source.• Describe the type of shadow formed due to the distance of the object and the light source.
Keywords: luminous, non-luminous, incident ray, reflected ray, normal ray, angle of incidence, angle of reflection, reflection, laws of reflection, transparent, translucent, opaque, shadow Types of Questions: <ul style="list-style-type: none">• Multiple choice questions• Identification and labelling of diagrams• Structured questions• Short answer reasoning• Descriptive questions Sample Questions: 1. Where will the shadow form in the following diagram? Give reason.	



- 2. Differentiate between reflection and reflection.
- 3. Draw and describe the direction and size of the shadow in the following scenario.

Time	Shadow	Description/Reason
12:00 p.m.		
05:00 p.m.		
07:00 a.m.		

- Workbook activities:**
- Activity 9.1, 9.2, 9.3A, 9.3B, 9.4, 9.5, 9.6 from International Lower Secondary Science Work book 1.

- Activities:**
- Examine the refraction and reflection of light by transparent, translucent and opaque objects.
 - Observation of the variation in size, shape and direction of shadow by placing light source at different positions and by using objects of different shapes.

- Laboratory Experiments:**
- To check the reflection of light through different materials (Transparent, Translucent and Opaque).
 - To investigate the direction of shadow by the movement (east to west) of light source.
 - To evaluate the refraction of light with the help of glass slab.

- Surf IT:**
- https://edurev.in/studytube/Study-Notes--Light--Shadows-and-Reflections--Chapter-13--Class-6-Science/4e323596-bb48-4e38-877c-9cf128384123_t

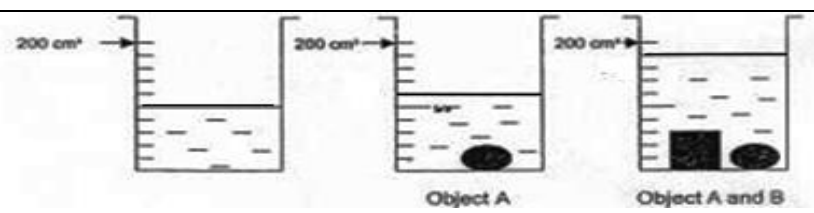
March

Chapter02: Physical Quantities and Measurements

Pages no: 24 - 52

Content	Learning Objectives
Measurement Observations can be qualitative and quantitative.	<ul style="list-style-type: none">Define the following:<ul style="list-style-type: none">➤ qualitative observations➤ quantitative observationsDifferentiate between qualitative and quantitative observations.
Physical quantities and SI units SI unit is the quantity which can be measured and used in the mathematical equations of science and technology. SI units are internationally adopted. Instruments are used to measure physical quantities SI units of common physical quantities <ul style="list-style-type: none">Length (m)Mass (kg)Time (s)Temperature (K)Electric current (A) Prefixes such as milli, centi and kilo are added to an SI unit to form smaller or larger units	<ul style="list-style-type: none">Define physical quantities.Identify different instruments.Define SI units.State the SI units of physical quantities:<ul style="list-style-type: none">➤ length (m)➤ mass (kg)➤ time (s)➤ temperature (k)➤ electric current (A)Define prefixes.Convert the prefixes of physical quantities.
Measuring Length Length is the distance between two points. Its SI unit is metre (m). Lengths are measured by a measuring tape and metre ruler. Parallax error is an error because the eye is not placed in the correct position.	<ul style="list-style-type: none">Define length.State SI unit of length.Describe the instrument used to measure lengths.Define parallax error.Convert given lengths from one unit to another.
Measuring Area Area is a measure of the extent of a surface. Its SI unit is square metre (m ²). Area of regular surfaces can be calculated by formula Square (l × l) Rectangle (l × b) Parallelogram (b × h) Trapezium ($\frac{1}{2} (a+b) \times h$) Triangle ($\frac{1}{2} b \times h$) Circle (πr^2) Area of irregular surfaces can be calculated by grid method	<ul style="list-style-type: none">Define area.State the SI unit of area.Calculate the area of regular surfaces by using formulae.Calculate the area of irregular surfaces by grid method.
Measuring Volume Volume is the space occupied by a substance. The SI unit is cubic metre (m ³). The volume of regular objects can be calculated using formula. <ul style="list-style-type: none">Cube (a³)Cylinder ($\pi r^2 h$)Cuboid (l × b × h)Sphere ($\frac{4}{3} \pi r^3$)	<ul style="list-style-type: none">Define volume.State SI unit of volume.Calculate the volume of regular objects by using formula.Suggest why calculating the volume may be required.Calculate the volumes of liquids placed in:<ul style="list-style-type: none">➤ cylinder➤ volumetric flasks➤ burettes

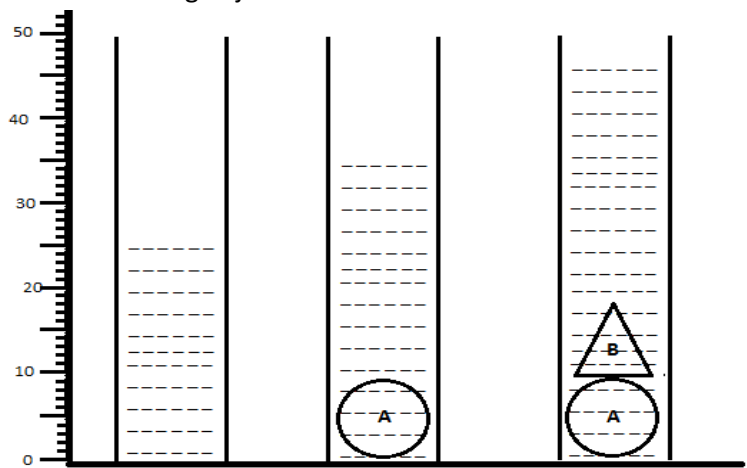
<ul style="list-style-type: none">• Cone ($\frac{1}{3}\pi r^2h$) <p>The volumes of liquids can be measured by cylinder, volumetric flasks, burettes, or pipettes. Volume of objects with irregular shapes can be measured with a displacement can and measuring cylinder.</p>	<ul style="list-style-type: none">➤ pipettes• Calculate the volume of irregular object by displacement can method• Calculate the volume of irregular object by measuring cylinder.
Measuring Mass <p>Mass is the amount of matter in a substance. Its SI unit is kilogram (kg). Mass can be measured by beam balance and electronic balance.</p>	<ul style="list-style-type: none">• Define mass.• State the SI unit of mass.• Describe the instruments used to measure mass.• Suggest why calculating mass may be required.
Measuring Time <p>SI unit of time is second. Time can be measure in different unit. Clock, watches pendulums, mechanical and digital stopwatches are used to measure time.</p>	<ul style="list-style-type: none">• State the SI unit of time.• Convert time from one unit to another.• Suggest why calculating time is an important matter.• Calculate time with a mechanical stopwatch and a digital stopwatch.• Calculate time with a digital stopwatch.
Speed <p>Speed is the distance travelled per unit time. SI unit of speed is metres/ second Formula of speed $\frac{\text{distance traveled}}{\text{time taken}}$ Average speed is the total distance travelled in total time taken Formula of speed $\frac{\text{total distance traveled}}{\text{total time taken}}$</p>	<ul style="list-style-type: none">• Define speed.• State the SI unit of speed.• Illustrate the formula of speed.• Calculate speed by using formula.• Define average speed.• Illustrate the formula of speed.• Calculate the average speed by using formula.• Differentiate between speed and average speed.• Suggest why calculation of speed may be required.
Density <p>Density is the mass per unit volume. Its SI unit is g/cm³ Formula of density $\frac{\text{mass}}{\text{volume}}$ Objects that have high density will sink in water whereas object having low density will float.</p>	<ul style="list-style-type: none">• Define density• State the unit of density• Illustrate the formula of density• Describe the effects of density on an object.
Key words: <p>quantitative, qualitative, physical quantities, area, mass, length, volume, time, displacement can, density, speed, average speed, measuring cylinder</p> Types of Questions <ul style="list-style-type: none">• Multiple choice questions• Identification and labelling of diagrams• Structured questions• Short answer reasoning• Descriptive questions Sample Questions: <p>1. Study the diagram below.</p>	



What is the volume of the object B?

- A. 40 cm³
- B. 60 cm³
- C. 140 cm³
- D. 160 cm³

2. Calculate the volume of the following objects.



- a. Volume of water: _____
- b. Volume of water and object A : _____
- c. Volume of object A : _____
- d. Volume of water, object A and object B: _____
- e. Volume of object B : _____

3. Convert the following units;

Kilometre (Km)	Metres(m)	Centimetre(Cm)
500		
	90	
		20

Workbook activities:

- Activity 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8 from International Lower Secondary Science Work book 1.

Activities:

- Demonstrate the measurement of irregular objects by measuring cylinder.
- Demonstration of sinking and floating of one object into another.

Laboratory Experiments:

- To investigate/predict the mass of the common objects.
- To evaluate the speed of a body covered a particular distance with in a respective time.
- To investigate the length of different objects using Vernier calliper.
- To investigate the volume of different objects of regular and irregular shapes using displacement method by using measuring cylinder and displacement can.
- To measure time taken by the pendulum with different lengths to swing.

Surf IT:

- <https://www.youtube.com/watch?v=SimFy9wOMXY>
- <https://www.quora.com/What-is-the-difference-between-speed-and-average-speed-Isnt-the-formula-to-calculate-them-practically-the-same>

April**Revision for Final Examination****May****Final Examination**