|  |  |  |  |
| --- | --- | --- | --- |
|  |  | *FORM ONE BIOLOGY TERM ONE* |  |
| *WK**NO* | *L/**NO* | *TOPIC/**SUBTOPIC* | *LESSON / SPECIFIC**OBJECTIVES* | *TEACHING / LEARNING ACTIVITIES* | *RESOURCES* */**MATERIALS* | *REF.* | *REMARKS* |
| 1 & 2  |  | ADMISSION |  |  |  |  |  |
| 3 | 1  | **INTRODUCTION TO BIOLOGY**Definition of Biology. | ***By the end of the lesson, learners should be able to****:*Define Biology. | Brainstorming to elicit responses on what science is all about.Discussion on nature, science and living things; leading to the definition of Biology.  |  | KLB BOOK I*Page 1* |  |
| 2 | Branches of Biology | Identify the two main branches of Biology.Name smaller branches of Biology. | Probing questions;Exposition of new terms. |  | KLB BOOK I*Page 1* |  |
| 3 | Importance of Biology. | Identify ways in which studying Biology is useful. | Open discussion on scientific knowledge acquired by learners, relevant courses, careers, emerging issues, e.g. AIDS. | *List of professions related to Biology.* | KLB BOOK I*Page 1* |  |
| 4 | Characteristics of living things. | Give characteristics of living things. | Q/A and exposition of new concepts. |  | KLB BOOK I *Pages 2-3* |  |
| 4 | 1 | Laboratory apparatus for collecting specimens. | Identify common laboratory apparatus for collecting specimens. | Collecting and examining specimens. | *Forceps, hand lenses, sweep nets, specimen bottles.* | KLB BOOK I *Pages 3-5* |  |
|  | 2 | Procedure for collecting specimens. | Outline the procedure for collecting specimens for study in the laboratory. | Teacher explains the procedure for collecting lab specimens, citing the precautions to be observed. |  | KLB BOOK I *Pages 5-6* |  |
| 3,4 | Collecting laboratory specimens. | Collect and observe various laboratory specimens. | Collecting specimens andobserving them. | *Forceps, hand lenses, sweep nets, specimen bottles.* | Lab manual. |  |
| 5 | 1 | **CLASSIFICATION I**IntroductionMagnification of a hand lens. | Explain the rationale of classifying organisms.Obtain the magnification of a hand lens.  | Q/A and discussion.Drawing magnified objects and obtaining the magnification. | *Diagrams of animals**Hand lenses.* | KLB BOOK I*Page 8* |  |
| 2 | External features of animals. | Identify external features of animals. | Q/A and brief discussion.Examine external features of animals. | *Diagrams of animals, preserved animal specimens.* | KLB BOOK I*Pages 9-13* |  |
| 3,4 | External features of plants. | Identify external features of plants. | Q/A and brief discussion.Examine external features of plants such as roots, venation, stems | *Diagrams and specimens of plants, hand lenses.* | KLB BOOK I*Pages 9-13* |  |
| 6 | 1 | Importance of classification.Taxonomic units of classification. | Explain the importance of classification.Identify taxonomic units of classification. | Q/A and brief discussion.Exposition of new terms related to taxonomy.Illustrate relative sizes of taxonomic units. | *Chart- diversity of organisms.* | KLB BOOK I*Pages 10-14* |  |
| 2 | Kingdoms of organisms.Species. | Identify the five kingdoms of classification.Define a species. | Expository approach of new concepts.Q/A on differences exhibited within a species. |  | KLB BOOK I*Pages 14-15* |  |
| 3,4 | Scientific naming system of organisms. | Explain the principles of binomial nomenclature.Identify the genus name and specific name of an organism. | Detailed discussion on scientific naming system.Oral and written exercises. |  | KLB BOOK I*Pages 15-17* |  |
| 7 | 1 | **THE CELL**Definition of a cell. | Define a cell.Differentiate between unicellular and multicellular organisms. | Q/A, expositions and explanations. |  | KLB BOOK I*Pages 14-15* |  |
| 2 | **The microscope.**Parts of a microscope. | Draw and label a microscope.State the function of each part of a microscope. | Drawing and labeling.Discussion on functionality of a microscope. | *A light microscope and an illustrative chart.* | KLB BOOK I*Pages 18-19* |  |
| 3,4 | Handling and using the microscope. | Demonstrate proper skills of handling the microscope.State precautions observed when handling a microscope. | Teacher demonstrations and explanations.Supervised handling of the microscope. | *Light microscopes.* | KLB BOOK I*Pages 19-20* |  |
| 8 | 1,2 | Magnification of a microscope. | Define magnification of a microscope. Calculate the magnification of a microscope.  | Q/A to review relevant familiar terms.Complete a table of magnifications. | *Objective and eye piece lenses.* | KLB BOOK I*Page 21* |  |
| 3,4 | Plant and animal cells under a light (and electron) microscope. | Draw diagrams of plant and animal cells as observed under a light microscope. | Observe permanent slides under a light microscope. Draw and label diagrams of cells. | *Permanent slides of cheek cells, epidermal cells, etc.* | KLB BOOK I*Pages 21-23* |  |
| 9 | 1, 2 | Cell organelles. | Draw various cell organelles.State the functions of various cell organelles.State differences between animal and plant cells.Identify similarities between the two. | Exposition of new concepts. |  | KLB BOOK I*Pages 23-26* |  |
| 3,4 | Preparing slides. | Prepare and observe temporary slides | Teacher guides students to prepare onion cells, observe them under a microscope.Drawing and labeling of observed diagrams. | *Microscope,**Microscope slides, cover slips, onion bulb, forceps, dropper.* | KLB BOOK I*Page 27* |  |
| 10 | 1 | Preparing stained slides. | Prepare and observe stained slides | Teacher guides students to prepare epidermal strips and observe them under a microscope.Drawing and labeling of observed diagrams. | *Microscope,**Microscope slides, cover slips, onion bulb, forceps, dropper, iodine solution.* | KLB BOOK I*Page 27* |  |
| 2 | Field of view of a microscope. | Relate mm, cm, μ m as units of length. Estimate the diameter of field of view of the low power of the objective lens. | Q/A on inter conversion of metric units.Use low power to focus on the mm scale of a ruler, then deduce the diameter of the field of view. | *Millimetre scale, low power objective lens.* | KLB BOOK I*Page 28* |  |
| 3,4 | Estimating size of a cell. | Estimate the diameter of an onion cell. | Use low power to focus on the mm scale of a ruler, then deduce the diameter of the field of view. Count the number of cells per mm, then deduce the size of a cell. | *Prepared slide of onion epidermis, microscope, ruler.* | KLB BOOK I*Page 27* |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 1 | Cell specialization. | Define cell specialization.Give examples of special cells. | Draw and label special cells.Brief discussion. | *Chart – specialized cells.* | KLB BOOK I*Pages 28-29* |  |
| 2 | Tissues in animals. | Define a tissue.Describe various tissues in animals. | Exposition of new concepts.Drawing and labeling tissues. | *Illustrative charts.* | KLB BOOK I*Page 29* |  |
| 3 | Tissues in plants. | Describe various tissues in plants. | Exposition of new concepts.Drawing and labeling plant tissues. | *Illustrative charts.* | KLB BOOK I*Pages 30-31* |  |
| 4 | Organs systems. | Define an organ.Give examples of organ systems. | Probing questions and detailed discussion. | *Illustrative charts.* | KLB BOOK I*Page 31* |  |
| 12 | 1,2 | **CELL PHYSIOLOGY**The cell membrane structure and properties | Define cell physiology.Identify functions of cell structures. Draw and label the cell membrane.State properties of the cell membrane. | Probing questions and detailed discussion. Drawing and labeling the cell membrane. | *Illustrative charts.* | KLB BOOK I*Pages 32-33* |  |
| 3-4 | *Diffusion as a p*hysiological process. | Define diffusion.Describe simple experiments to demonstrate diffusion.Explain the role of diffusion in living organisms. | Q/A, teacher demonstrations and discussion. | *KMnO4 crystals or flower dyes or smoke chamber.* | KLB BOOK I*Pages 33-35* |  |
| *FORM ONE BIOLOGY TERM TWO YEAR*  |
| ***WK/NO*** | ***L/******NO*** | ***TOPIC / SUBTOPIC*** | ***LESSON OBJECTIVES*** | ***TEACHING / LEARNING ACTIVITIES*** | ***RESOURCES / MATERIALS*** | ***REF*** | ***REMARKS*** |
| 1 | 1,2 | Rate of diffusion. | Explain how various factors affect the rate of diffusion. | Probing questions and discussion on diffusion gradient, surface area-volume ratio, thickness of membrane, size of molecule and temperature. | *Cubes of various dimensions.* | KLB BOOK I*Page 31* |  |
| 34 | Osmosis as *a p*hysiological process.Osmotic terms. | Define osmosis.Describe experiments to demonstrate osmosis.Describe solutions using biological terms. | Group experiments and discussion.Exposition of new terms, isotonic and hypertonic solutions. | *Illustrative chart: semi permeable membrane.* | KLB BOOK I*Pages 36-40* |  |
| 2 | 1,2 | Osmosis in plants. | Describe experiments to show osmosis in plants. | Brief discussion and exposition.Examine osmosis in living cells, e.g. onion skin cells. | *Onion skin / irish potato, slides,**forceps, common salt, microscope.* |  |  |
| 3,4 | Role of osmosis in plants. | Explain the role of osmosis in plants. | Q/A and guided discussion. |  | KLB BOOK I*Page 41* |  |
| 3 | 12 | Osmosis in animals.Role of osmosis in animals. | Describe water relations in animals.Describe role of osmosis in animals.Explain factors that affect osmosis. | Exposition of new terms with probing questions. |  | KLB BOOK I*Pages 42-43* |  |
| 3,4 | Active transport. | Describe water relations in plants.State the role of active transport in plants. | Oral questions and brief discussion. |  | KLB BOOK I*Page 44* |  |
| 4 | 1 | NUTRITION IN PLANTS AND ANIMALSIntroduction.Autotrophism and hetetrophism. | Define nutrition.State importance of nutrition.Differentiate between autotrophism and heterotrophsm. | Q/A and guided discussion. |  | KLB BOOK I*Page 48* |  |
| 2-4 | External structure of a leaf. | Describe the external structure of a leaf. | Examine the external structure of a leaves.Draw and label different types of leaves.Q/A and brief discussion on differences between monocotyledonous and dicotyledonous leaves. | *Monocotyle-donous and dicotyledo -nous leaves, hand lenses.* | KLB BOOK I*Pages 49-50* |  |
| 5 | 1 | C.A.T. |  |  |  |
| 2-4 | Internal structure of a leaf. | Draw and label the trans- section of a leaf.State the functions of the internal parts of a leaf. | Drawing and labeling a cross-section of a leaf.Discuss the function of each internal part. | *Chart – trans-section of a leaf.* | KLB BOOK I*Pages 50-51* |  |
| 6 | 1 | Photosynthetic function of a leaf. | Explain the adaptations of a leaf to its photosynthetic function. | Q/A and detailed discussion. |  | KLB BOOK I*Page 51* |  |
| 2 | The chloroplasts.  | Describe the structure of a chloroplast.Explain the adaptations of the chloroplast to its function. | Drawing and labeling a chloroplast.Brief discussion. |  | KLB BOOK I*Page 51* |  |
| 7 | 3,4 | Distribution of stomata. | Account for the distribution of stomata on leaf surfaces. | Group experiments: determine number of stomata on leaf surfaces.Discuss the results. | *Klaes / zebrine/ tradescantia leaves, microscope, cover slips, dropper.* | KLB BOOK I*Pages 52-53* |  |
| 8 | 1,2 | The process of photosynthesis.-*Light stage*-*Dark stage*  | Identify raw materials for photosynthesis.Describe the light / dark stage of photosynthesis. | Exposition of new concepts, Q/A and detailed discussion. |  | KLB BOOK I*Pages 53-54* |  |
| 3,4 | Test for starch in a leaf.- CO2. | Test for presence of starch in a leaf. | Group experiments and make inferences from the results. | *Variegated leaves, iodine solution, methylated spirit, source of heat.* | KLB BOOK I*Page 57* |  |
| 9 | 1,2 | Effect of amount of light on rate of photosynthesis. | Describe experiments to show the effect of amount of light on rate of photosynthesis.  | Group experiments: examine a previously potted plant and test for starch.Discuss the results. | *Destarched leaves.* | KLB BOOK I*Page 57-58* |  |
| 3,4 | Effect of CO2 concentration on rate of photosynthesis. | Describe experiments to show the effect of CO2 concentration on rate of photosynthesis. | Group experiments: examine plants under different CO2 concentration.Discuss the results. | *Potted plant NaOH pellets, droppers.* | KLB BOOK I*Pages 57-58* |  |
| 10 | 1,2 | Chlorophyll and photosynthesis. | Describe experiments to show that chlorophyll is required for photosynthesis. | Examine a variegated leaf, carry out starch test and discuss the results. | *Variegated leaf iodine solution, heat.* | KLB BOOK I*Pages 58-59* |  |
| 3,4 | Oxygen as by-product of photosynthesis. | Show that oxygen is a by-product of photosynthesis. | Teacher demonstration and carrying out tests for oxygen. | *Test tubes, water plant, wooden splint, NaHCO3.* | KLB BOOK I*Page 59* |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 1,2 | **Chemicals of life:**Carbohydrates. | Name classes of carbohydrates.State properties and functions of monosacchrides, disacchrides and polysacchrides. | Exposition of new concepts, oral questioning and brief discussion. |  | KLB BOOK I*Pages* *59-60* |  |
| 3,4 | Test for starch in food substances. | Carry our tests to determine presence of starch in food substances. | Group experiments: making observations and drawing conclusions. | *Iodine solution, distilled water, test tubes, food substances.* | KLB BOOK I*Pages* *61-62* |  |
| 12 | 1 | Test for reducing sugars. | Carry our tests to determine presence of reducing sugars in given food substances. | Group experiments: making observations and drawing conclusions. | *Glucose, Benedict’s solution, water bath, containers.* | KLB BOOK I*Page 62* |  |
| 23 | Test for non-reducing sugars.Properties of lipids. | Carry our tests to determine presence of non-reducing sugars. Identify properties of lipids. | Group experiments: making observations and drawing conclusions. | *Sucrose, Benedict’s solution, water bath, HCl, NaHCO3 solution.* | KLB BOOK I*Pages* *62-63* |  |
| 4 | Functions of lipids.  | State functions of lipids. | Exposition of new concepts.Brief discussion. |  | KLB BOOK I*Page 64* |  |
|  |  | END TERM EXAMS |  |  |  |  |  |
| ***BIOLOGY FORM ONE TERM THREE***  |
| ***WK/NO*** | ***L/******NO*** | ***TOPIC / SUBTOPIC*** | ***LESSON OBJECTIVES*** | ***TEACHING / LEARNING ACTIVITIES*** | ***RESOURCES / MATERIALS*** | ***REF*** | ***REMARKS*** |
| 1 | 1 | Test for lipids. | Describe experiments to show presence of lipids. | Group experiments: making observations and drawing conclusions. | *Fat / oil, ethanol, filter paper.* | KLB BOOK I*Page 64* |  |
| 2 | Proteins.- constituents and functions. | Identify constituents of proteins.State functions of proteins. | Exposition of new concepts.Brief discussion. |  | KLB BOOK I*Page.* |  |
| 3,4 | Test for proteins. | Describe experiments to show presence of proteins. | Group experiments: making observations and drawing conclusions. | *NaOH solution, egg albumen or milk, test tubes, droppers, CuSO47 solution.* | KLB BOOK I*Page.* |  |
| 2 | 1,2 | Enzymes. | Define an enzyme.Differentiate between intracellular and extracellular enzymes.Identify common enzymes. | Exposition of new concepts.Brief discussion. |  | KLB BOOK I*Page.* |  |
| 3,4 | Enzymes and temperature. | Illustrate graphically the effect of temperature on enzyme activity. | Group experiments, analyse the observations made. | *Benedict’s solution, iodine, water bath, thermometer, starch powder, amylase, graph papers.* | KLB BOOK I*Pages* *67-68* |  |
| 3 | 1 | Enzymes and pH. | Illustrate graphically the effect of pH on enzyme activity. | Group experiments, analyse the observations made.Sketch graphs to represent the observations made. | *Graph papers.* | KLB BOOK I*Page* *68* |  |
| 2 | Enzymes and substrate concentration. | Explain the effect of substrate concentration on rate of enzyme activity. | Probing questions and brief discussion. |  | KLB BOOK I*Page 69* |  |
|  | 3 | Importance of enzymes. | Discuss the importance of enzymes. | Q/A and brief discussion. |  | KLB BOOK I*Page* *69-70* |  |
| 4 | Enzyme inhibitors. | Define an enzyme inhibitor.Describe various enzyme competitive inhibitors. | Probing questions and exposition of new ideas. |  | KLB BOOK I*Page 69* |  |
| 4 | 1 | **Nutrition in animals.**Heterotrophic mode of nutrition. | Describe various modes of heterotrophic nutrition.Differentiate between heterodonts and homodonts. | Exposition of new ideas coupled with probing questions. | *Specimens of various sets of teeth.* | KLB BOOK I*Pages* *72-73* |  |
| 2,3 | Dental formula. | Identify components of a dental formula.Relate dental formulas with feeding habits of animals. | Probing questions, exposition and discussion.Compare dentition in carnivores, herbivores and omnivores. | *Jawbones of rabbit, sheep, dog.* *Picture of human skull.* | KLB BOOK I*Pages* *73-74* |  |
| 4,1 | Structure of a tooth. | Draw and label vertical sections of teeth. | Drawing and labeling. | *Charts-vertical section of teeth.* | KLB BOOK I*Pages* *75-76* |  |
| 5 |
| 2,3 | Dental diseases. | Identify common dental defects and diseases. | Open discussion on oral hygiene.Brief discussion on dental caries and periodontal. | *Photographs of teeth with dental disorders.* | KLB BOOK I*Pages* *77-78* |  |
| 4 | C.A.T |  |  |  |  |
| 6 | 1,2 | Digestive system in animals.Introduction.The digestive system | Define ingestion, digestion, mastication, digestion and egestion.Draw and label the digestive tract. | Q/A and brie discussion.Drawing and labeling. | *Chart- the digestive system.* | KLB BOOK I*Pages* *78-79* |  |
| 3,4 | Digestion in the mouth.Digestion in the stomach. | Describe digestion of food in the mouth and in the stomach. | Probing questions, exposition of new terms and brief discussion. |  | KLB BOOK I*Pages* *77-80* |  |
| 7 | 1 | Digestion in the duodenum. | Describe digestion of food in the duodenum. | Exposition and brief discussion. | *Cooking oil, NaHCO3 solution, test tubes.* | KLB BOOK I*Page 80* |  |
| 2 | Emulsification of fats. | Describe simple experiments to show emulsification of fats. | Teacher demonstration;Discussion. |  | KLB BOOK I*Page 81* |  |
| 3,4 | Digestion in ileum. | Describe digestion of food in the ileum. | Probing questions, exposition of new terms and brief discussion. |  | KLB BOOK I*Page 81* |  |
| 8 | 1 | Food absorption. | Explain adaptive features of the ileum. | Drawing and lebelling diagrams & discussion. |  | KLB BOOK I*Pages* *83-84* |  |
| 2 | Food assimilation & egestion. | Identify the forms in which food is assimilated. | Probing questions;Brief discussion. |  | KLB BOOK I*Page 84* |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 3 | Vitamins. | List down types of vitamins and their sources. | Copying a table of vitamins, their sources, functions and deficiency symptoms. |  | KLB BOOK I*Pages* *85-86* |  |
| 4 | Test for vitamin C. | Carry out an experiment to test for vitamin C. | Group experiments and making analytical inferences. | *Substrates,**DCPIP, ascorbic acid.* | KLB BOOK I*Page 87* |  |
| 9 | 1,2 | Mineral salts. | Classify mineral salts.Explain importance of minerals. | Q/A and brief discussion.Copy a table showing type of mineral, the source and the function in the body and deficiency symptoms. |  | KLB BOOK I*Page 87* |  |
| 3,4 | Energy requirements in humans. | State and explain factors affecting food intake. | Probing questions and brief discussion. |  | KLB BOOK I*Pages* *88-89* |  |
|  |  | *END OF TERM THREE EXAMS* |  |