**BIOLOGY SCHEMES OF WORK FORM 3**

**TERM 2**

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| **WK** | **LSN** | **TOPIC** | **SUB-TOPIC** | **OBJECTIVES** | **T/L ACTIVITIES** | **T/L AIDS** | **REFERENCE** | **REMARKS** |
| 1 | **Opening and Revision** | | | | | | | |
| 2 | 1 | ECOLOGY | Ecological pyramids of numbers. Constructing Pyramid of numbers from given data. | By the end of the lesson, the learner should be able to:  To represent feeding relationships and energy flow using pyramids of numbers. To construct pyramid of numbers from given data. To interpret constructed pyramid of numbers from given data. | Q/A: Review trophic levels. Teacher explains features of pyramid of numbers. Q/A: Identifying trophic levels of organisms. Use given date to construct pyramid of numbers. Supervised Exercise. | chart text book | KLB BK III. PP 41-42. |  |
| 2 | ECOLOGY | Inverted pyramid of numbers. | By the end of the lesson, the learner should be able to:  Give examples where an inverted pyramid of numbers exists; giving reasons thereof. | Representing inverted pyramid of numbers diagrammatically. | Chart- Inverted pyramid of numbers. | KLB BK III. PP 43-44 |  |
| 3-4 | ECOLOGY | Pyramid of Biomass. Population. Quadrat method of estimating population. Quadrat method of estimating population. | By the end of the lesson, the learner should be able to:  To define biomass of an organism. To interpret the pyramid of biomass. To construct a biomass from given data. To describe some characteristics of populations. To explain factors affecting population growth rate. To describe the quadrat method of estimating population. To suggest limitations of quadrat method of estimating population. To estimate population using quadrat method. | Teacher exposes new concepts; then leads in a detailed discussion. Students construct biomass from given data. Q/A: Definition of population. Discuss population density, dispersion and growth. Q/A: Factors affecting population growth rate; including food availability, space, diseases such as HIV/AIDS, pests, e.t.c. Teacher explains use of quadrat method of estimating population. Q/A: limitations of quadrat method of estimating population. Project- students to make quadrats. Students? outdoor activity- Estimating population using standard quadrats. | chart text book text book Standard quadrats. | KLB BK III. PP 44-45. KLB BK III. PP 46-47. |  |
| 5 | ECOLOGY | Line - transect method of estimating population. | By the end of the lesson, the learner should be able to:  To describe the line transect method of population. To suggest limitations of line transect method of population. | Teacher explains procedure of line transect method of population. Q/A: Students suggest limitations of line transect method of population. | text book | KLB BK III.  PP 47-48. |  |
| 3 | 1 | ECOLOGY | Belt transect method of estimating population. Capture-recapture method. | By the end of the lesson, the learner should be able to:  To estimate population using belt transect method of population. To describe capture-recapture method of estimating population. To suggest limitations of capture-recapture method. To estimate population size using capture-recapture method. | Group work ? outdoor activity. Discussion. Detailed discussion and explanations. Q/A: Assumptions made in this method, limitations of the method. Worked examples. | Tape measure, quadrats, pegs, thermometer, pH indicator, e.t.c specimen | KLB BK III. PP 48-49. |  |
| 2 | ECOLOGY | Xerophytes. | By the end of the lesson, the learner should be able to:  To state characteristics of dry habitats. To identify adaptations of xerophytes to their habitats. | Q/A: Characteristics of dry habitats. Discussion: Adaptations of xerophytes to dry habitats. | Specimens of xerophytes. | KLB BK III. P 50. |  |
| 3-4 | ECOLOGY | Mesophytes. Hydrophytes. Halophytes. | By the end of the lesson, the learner should be able to:  To state characteristics of habitats of mesophytes. To explain adaptations of mesophytes to their habitats. To state characteristics of habitats of hydrophytes. To explain adaptations of hydrophytes to their habitats. To state characteristics of habitats of halophytes. To explain adaptations of halophytes to their habitats. | Q/A: Characteristics of habitats where mesophytes thrive. Discussion: Adaptations of mesophytes to their habitats. Q/A: Characteristics of habitats where hydrophytes. thrive. Discussion: Adaptations of hydrophytes to their habitats. Q/A: Characteristics of dry habitats. Discussion: Adaptations of dry habitats. | Specimens of mesophytes. Specimens of hydrophytes.  Specimens of halophytes. | KLB BK III. P 51. KLB BK III. P 52. |  |
| 5 | ECOLOGY | Adaptive features of plants. | By the end of the lesson, the learner should be able to: | Group experiments- Students examine given specimens and suggest their habitats. Identify adaptive features. | Xerophytes Mesophytes Hydrophytes Hand lenses. | KLB BK III. P 50. |  |
| 4 | 1 | ECOLOGY | Pollution and its effects. | By the end of the lesson, the learner should be able to:  To define pollution, pollutants. To explain effects of pollution on human beings and other organisms. | Discussion punctuated with Q/A. | text book | KLB BK III. P 55. |  |
| 2 | ECOLOGY | Air pollution. | By the end of the lesson, the learner should be able to:  To identify causes and effects of air pollution. To suggest control measures of air pollution. | Detailed discussion & probing questions. | topic related video | KLB BK III. PP 56-59. |  |
| 3-4 | ECOLOGY | Air pollution. Water pollution. Soil pollution. | By the end of the lesson, the learner should be able to:  To identify causes and effects of air pollution. To suggest control measures of air pollution.   To identify causes and effects of water pollution. To suggest control measures of water pollution. To identify causes and effects of soil pollution. To suggest control measures of soil pollution. | Detailed discussion & probing questions. Detailed discussion & Q/A. | topic related video video of water pollution text book | KLB BK III. PP 56-59.  KLB BK III. P 60. |  |
| 5 | ECOLOGY | Radioactive emissions. | By the end of the lesson, the learner should be able to:  To identify effects of radioactive emissions. To state uses of nuclear energy. | Brief discussion on radioactive emissions and nuclear energy | text book | KLB BK III. P 62. |  |
| 5 | 1 | ECOLOGY | Human diseases. Typhoid & cholera. | By the end of the lesson, the learner should be able to:  To identify disease predisposing factors. To describe causative agents, symptoms, prevention of bacterial diseases. | Detailed discussion with probing questions. | text book | KLB BK III. P 63. |  |
| 2 | ECOLOGY | Protozoan diseases. | By the end of the lesson, the learner should be able to:  To identify causal agents, symptoms, prevention and treatment of amoebic dysentery and malaria. | Detailed discussion, Q/A. | magazine | KLB BK III. PP 66. |  |
| 3-4 | ECOLOGY | Prevention and control of protozoan diseases. Ascaris lumbricoides. Bilharzia. | By the end of the lesson, the learner should be able to:  To explain methods of preventing and controlling protozoan diseases. To identify adaptive features of Ascaris lumbricoides. To state and explain effects of a parasite on the host. To suggest preventive and control measures. To identify causal and transmission agents of bilharzia. To describe effects of the parasite on its host. To identify adaptive features of schistosoma. | Group activities: Students examine preserved specimens of Ascaris lumbricoides and identify some adaptive features. Detailed discussion. Brief discussion  Q/A: Effects on host and control measures. | Preserved specimens of Ascaris lumbricoides. chart | KLB BK III. P 67. |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | Introduction | By the end of the lesson, the learner should be able to:  To differentiate between sexual and asexual reproduction. To state importance of reproduction. | Q/A: Defination of reproduction. Teacher illustrates and explains sexual and asexual reproduction. | text book | KLB BK III. P 78. |  |
| 6 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Cell division. | By the end of the lesson, the learner should be able to:  To define genes and chromosomes. To describe the role of chromosomes in cell division. | Detailed discussion. | chart | KLB BK III.  P 79. |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Mitosis. | By the end of the lesson, the learner should be able to:  To describe the process of mitosis. | Teacher leads in a detailed discussion. Drawing diagrams showing stages of mitosis. | charts | KLB BK III.  P 80. |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Mitosis in a young root tip. Significance of mitosis. Meiosis. | By the end of the lesson, the learner should be able to:  To describe an experiment to show mitosis in a young root tip. To explain significance of mitosis. To distinguish meiosis from mitosis.  To explain the principle underlying meiosis. | Group experiments: Observing different stages of mitosis. Drawing cells showing stages of mitosis. Comparing drawn cells with those previously drawn. Detailed discussion. Explanations | Onion root tip. Microscope IM HCl Cover slides. text book | KLB BK III.   P 80. KLB BK III.  P 82. |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | First and second meiotic divisions. | By the end of the lesson, the learner should be able to:  To describe the processes of first and second meiotic divisions. | Explanations and drawing diagrams. | Chart- stages of second meiotic division. | KLB BK III.  P 82. |  |
| 7 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Meiosis in plant cells. Significance of meiosis. | By the end of the lesson, the learner should be able to:  To identify various stages of meiosis. To explain significance of meiosis. | Group experiments- meiosis in young flower bulbs. Drawing cells showing stages of meiosis. Comparing drawn cells with those previously drawn. Detailed discussion.  Probing questions leading to differences between mitosis and meiosis. | Flower buds IM HCl Source of heat Glass slide Filter paper Microscope | KLB BK III.  P 82. |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Asexual reproduction. Binary fission. | By the end of the lesson, the learner should be able to:  To identify types of asexual reproduction. To describe the stages of binary fission in amoeba. | Exposition and discussion.  Drawing diagrams/ discussion. | Chart- Binary fission in amoeba | KLB BK III.  P 87. |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Spore formation. Budding.  Budding in yeast. | By the end of the lesson, the learner should be able to:  To describe the process of spore formation in bread// ugali mould. To explain conditions necessary for budding in yeast. | Mould on bread /ugali. Identify and draw hyphae and sporangia. Exposition and discussion. Identifying, drawing and labeling yeast cells. | Microscope bread/ ugali mould Hand lens. Previously prepared 10% sugar solution Methylene blue Microscope | KLB BK III.  P 88. KLB BK III.  P 89. |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | Sexual reproduction in plants. Structure of a flower. | By the end of the lesson, the learner should be able to:  To draw and label a flower. | Group experiments- Examine flowers and identify parts. Counting number of sepals, petals, stamen, carpels. | Bean flower Morning glory Bauhinia Longitudinal section of a general flower. | KLB BK III.  P 90. |  |
| 8 | **Mid Term Exams and Break** | | | | | | | |
| 9 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Flower terminologies. | By the end of the lesson, the learner should be able to:  To explain terms related to flowers. | Exposition of new concepts. Teacher demonstration- examining features of flowers. | Flowers. | KLB BK III.  P 91. |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Pollination. Insect-pollinated flowers. | By the end of the lesson, the learner should be able to:  To define pollination. To identify agents of pollination. To describe the structure of insect-pollinated flowers. | Q/A: Definition of pollination. Agents of pollination. Class experiment- Structure of insect pollinated flowers. Students identify various parts. | Insect-pollinated flowers. | KLB BK III.  P 93. |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Pollination. Insect-pollinated flowers. Wind-pollinated flowers. Adaptive features of wind-pollinated flowers. | By the end of the lesson, the learner should be able to:  To define pollination. To identify agents of pollination. To describe the structure of insect-pollinated flowers. To describe the structure of wind-pollinated flowers. To state and explain adaptive features of wind-pollinated flowers. | Q/A: Definition of pollination. Agents of pollination. Class experiment- Structure of insect pollinated flowers. Students identify various parts.  Class experiment-examine inflorescence of star grass/ maize/ sugarcane. Identify glumes, spikes and spikelets. Compare them in text books/ charts. Q/A: adaptive features of wind-pollinated flowers. | Insect-pollinated flowers. Wind-pollinated flowers. | KLB BK III.  P 93. KLB BK III.  PP 93-94. |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | Features hindering self-pollination. | By the end of the lesson, the learner should be able to:  To discuss features and mechanisms that hinder self-pollination in plants. | Exposition and detailed discussion. | wind & inect pollinated flower | KLB BK III. PP 93-94. |  |
| 10 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Fertilisation process in flowering plants. | By the end of the lesson, the learner should be able to:  To define fertilisation.  To describe the fertilisation process in flowering plants. | Drawing diagrams,  detailed discussion. | chart | KLB BK III.  P 95. |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Seed formation. | By the end of the lesson, the learner should be able to:   To explain formation of seeds. | Detailed discussion. | text book | KLB BK III.  P 97. |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Fruit development. Classification of fruits. | By the end of the lesson, the learner should be able to:   To describe development of fruits in flowering plants.  To classify fruits using specific criteria. | Detailed discussion.   Teacher presents several types of fruits and leads students in classifying them. Detailed discussion, drawing of diagrams. | text book  A variety of fruits, petri dishes Blades Containers. | KLB BK III.  P 98. KLB BK III.  P 99. |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | Placentation. | By the end of the lesson, the learner should be able to:   To define placentation. To describe the process of placentation. To identify types of placentation. | Teacher exposes the meaning of placentation. Students examine ovaries of various fruits as the teacher exposes the types of placentation exhibited. Students draw diagrams showing types of placentation. | Fruits  Beans Sunflower Pawpaw Orange Primrose, e.t.c | KLB BK III.  P 100. |  |
| 11 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Fruit and seed dispersal. | By the end of the lesson, the learner should be able to:  To explain adaptive features of fruits and seeds to their agents of dispersal. | Students examine fruits and seeds, observe external features, and group them accordingly to methods of dispersal. Detailed discussion of observations made. | text book | KLB BK III. PP. 102-103 |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Fruit and seed dispersal. | By the end of the lesson, the learner should be able to:  To explain adaptive features of fruits and seeds to their agents of dispersal. | Students examine fruits and seeds, observe external features, and group them accordingly to methods of dispersal. Detailed discussion of observations made. | text book | KLB BK III. PP. 102-103 |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Internal structure of fruits. Sexual reproduction in animals. External fertilisation. Internal fertilisation. | By the end of the lesson, the learner should be able to:  To label the parts of internal structure of a fruit.  To identify the functions of internal parts of a fruit.  To describe external fertilisation in amphibians. To describe internal fertilisation and compare it with external fertilisation. | Teacher demonstration- Vertical sections of fruits.  Students draw and label the fruit internal structure.    Detailed discussion. Tabulate differences between external and internal fertilisation. | charts Strands of eggs of frogs. | KLB BK III. P. 104 KLB BK III.  P 105 |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | Reproduction in mammals. Reproduction in human beings. | By the end of the lesson, the learner should be able to:  To explain the reproduction process in mammals.   To draw and label the structure of male reproduction system. | Detailed discussion.    Drawing and labeling male reproduction system. | Wall charts-Reproduction system. | KLB BK III. P. 105 |  |
| 12 | 1 | REPRODUCTION IN PLANTS AND ANIMALS | Functions of parts of male reproduction system. | By the end of the lesson, the learner should be able to:  To explain the male reproduction system. | Detailed discussion. | text book | KLB BK III. PP. 106-108 |  |
| 2 | REPRODUCTION IN PLANTS AND ANIMALS | Male reproduction system of a male animal. | By the end of the lesson, the learner should be able to:  To identify parts of male reproduction system of a rabbit/ rat. | To examine reproduction system of a male rabbit /rat. Identify the parts of the reproduction system. | Reproduction system of a rabbit/ rat. | KLB BK III. P. 108 |  |
| 3-4 | REPRODUCTION IN PLANTS AND ANIMALS | Female reproduction system. Functions of parts of female reproduction system. Female reproduction system of a female animal. | By the end of the lesson, the learner should be able to:  To draw and label parts of the female reproduction system. To explain the functions of parts of female reproduction system. To identify parts of female reproduction system of a female animal. | Drawing and labeling. Detailed discussion. Examine parts of a female reproduction system. Identify the parts. | chart chart Dissected female rat/ mouse/rabbit. | KLB BK III. PP.  108-110. KLB BK III. PP. 108-110 |  |
| 5 | REPRODUCTION IN PLANTS AND ANIMALS | The human sperm. Formation of ova. | By the end of the lesson, the learner should be able to:  To draw and label the human spermatozoon.  To describe the process of formation of ova. | Drawing and labelling. Detailed discussion. Q/A: Adaptations of male gamete to its function. | text book | KLB BK III. PP. 112-113 |  |
| 13-14 | **End Term Exams and closing** | | | | | | | |