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| WK | PRD | THEME | COMPETENCY | LEARNING OUTCOMES | RESOURCES | LEARNING ACTIVITIES. | ASSESMENT STRATEGY | REF |
| 1-4 | **16** | **GROWTH IN PLANTS AND ANIMALS** | The learner understands how, throughout its life, an organism goes through changes in size. | LEARNERS SHOULD BE ABLE TO:  Distinguish between the terms ‘growth’ and‘development.  Appreciate that mitosis leads to increase in size and weight in animals.  Understand the internal and external structure of a seed.  Conduct experiments on conditions necessary for seed germination.  Identify the roles of water, oxygen, and temperature in the process of germination.  Identify and describe the type of seed germination in monocots and dicots. | The learner can use data processing software to show changes in height of a germinating seed overtime..  GRAPHS  NURSERY BED | In groups, learners examine images of young and mature plants and animals (including some that metamorphose).Discuss and derive the meaning of the terms ‘growth’ and ‘development’, and share conclusions with the class.  In pairs, learners examine data from growth cards of five babies, draw growth curves and make deductions from the graphs.  In groups, learners role-play the process of mitosis using cards showing the different stages (names of stages not required), and show role play to the class  In groups or pairs, learners discuss and explain verbally or in writing, the importance of mitotic cell division in living organisms.  In pairs, learners examine a fresh bean and a maize seed (soaked overnight), and:  describe and draw the external features  cut the seeds longitudinally, observe using a hand lens, describe and draw the internal structure  In groups, learners use scientific process skills to design, carry out and report on an experiment to investigate whether air and water are necessary for germination, and the effect of temperature on germination.  **Group project**: Learners plant a set of bean and/or maize seeds. From the time of germination, they monitor and record the changes in length every week for up to 10 weeks. Record growth and development information; presenting growth data in a graph.. | Observe pairs/groups as they examine soil samples.  Listen to conversations and ask questions to gauge and deepen learning.  Evaluate products: records of characteristics of each soil type.   * Observe groups and pairs carrying out activities. Check that they plan investigations that will give meaningful results. * Listen to pairs’ discussions and monitor understanding and their progress towards learning outcomes. Ask probing questions to promote critical thinking and deepen learning.   Evaluate quality of products from activities: reports of investigations; conclusions relating to impact of different properties on quality of soil; explanations of importance of air, water, and humus, as well as the impact of soil types on crop yield and reasons for it. | New Biology for tropical schools, Stones and Cozens |
| 5-7 | 20 | DEVELOPMENT IN PLANT | The learner understands that organisms develop specialized cells, tissues, and organs as they grow leading to changes in structure and function. | LEARNERS SHOULD BE ABLE TO:  Understand the need for differentiation of cells as multicellular plants and animals grow.  Understand the process of secondary growth of stems in dicotyledonous plants.  Know the meaning of the term metamorphosis, and compare complete and incomplete metamorphosis.  Know the stages of development in an insect.  Understand the lifecycles of a housefly, cockroach, mosquito, bee, and butterfly.  recognise and compare the main characteristics of stages of human development from birth to adulthood, including the developmental stages of a child (physical, behavioural, and cognitive) understand the physical, physiological, psychological, (emotional) and behavioural changes associated with adolescence and puberty; highlight the associated myths.  Understand and be able to cope with changes related to secondary sexual characteristics at puberty.  Understand various features related to the process of aging. | The learner can use the internet as a source of research information on body changes. | In groups, learners discuss the need for cells to become specialised as animals and plants grow, considering the different types of cells in their own bodies and in plants they can see in the locality. Groups share conclusions in whole class discussion and agree on a definition of cell differentiation.  In pairs, learners research on secondary growth in dicot stems. Pairs share understanding with larger group and record agreed conclusions in annotated diagrams or notes.  Learners observe video clips of complete and incomplete metamorphosis, or research using different sources. In pairs, learners produce a table comparing the two types.  Individuals produce drawings to show stages of each type of metamorphosis in insects.  In pairs, learners research on and produce life cycle diagrams for housefly, cockroach, mosquito, bee, and butterfly; annotating diagrams to illustrate the type of metamorphosis each undergoes.  In groups, learners observe drawings, animations or other sources and discuss the stages of human development; noting the physical, behavioural, and cognitive changes that take place from birth, through childhood and adulthood into old age (in notes and/or drawings) | * Observe pairs and groups involved in activities to ensure that all are involved (taking into account that this unit involves discussion of sensitive issues), and making good use of resources and time. * Listen to pair and group conversations and contributions to class discussion. Ask probing questions to encourage learners to engage with sensitive topics so that all make progress and achieve learning outcomes.   Evaluate quality of products: oral feedback, notes, drawings, diagrams, and reports. | Biology, An integrated approach, Soper and Smith |
| 8-10 | 16 | ASEXUAL REPRODUCTION IN PLANTS | The learner appreciates that some parts of a plant can develop into new independent plants. | Know the meaning of asexual reproduction.  Understand how plants reproduce asexually.  Understand that asexual reproduction in plants has important commercial applications. | use graphical software to draw a labelled diagram of a local flower  Use mind mapping or word processing software to categorise fruits and seeds by their structure. | In groups or pairs, learners examine specimens and/or diagrams of insect- pollinated flowers, research using different sources, and then discuss:  the meaning of the term pollination and how pollination takes place  how fertilisation takes place  how seeds and fruits develop  Individuals produce annotated diagrams explaining these processes.  In groups or pairs, learners examine examples of flowers that are wind- pollinated (e.g. maize, grasses) and some that are insect-pollinated, and compare the two, especially the stamens/anthers and stigmas of each, relating structure to function. Learners then compare images or microscope slides of pollen grains from wind and insect-pollinated flowers, again relating structure to function.  Individuals produce a table/report comparing the two types of flowers and pollen.  In pairs, learners research the meaning of cross- and self-fertilisation and produce a table comparing the two.  In pairs, learners examine specimens and or diagrams of fruits and seeds and discuss and explain (verbally and in notes):  the structural and functional difference between fruits and seeds  how different seeds are dispersed, stating why dispersal is so important | Observe pairs and groups carrying out activities. Ensure that all individuals are participating and understanding lessons emerging from examination of specimens, diagrams and research; making progress with each task towards learning outcomes.  Listen to learners’ conversations and ensure that all learners grasp concepts and understand all processes set out in the learning out come.  Evaluate quality of learning through products: annotated diagrams, tables and reports, verbal and written explanations. | INTRODUCTION TO BIOLOGY. |