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| WK |  | THEME | COMPETENCY | LEARNING OUTCOMES | RESOURCES | LEARNING ACTIVITIES. | ASSESMENT STRATEGY | REF |
| 1-4 | **20** | **PHYSICAL AND CHEMICAL PROPERTIES OF SOIL** | The learner knows that different soil types are made of different components and the balance of these components determines the properties of the soil. | LEARNERS SHOULD BE ABLE TO:  Identify the types of soil.  Determine soil constituents and identify their properties.    Understand that different soil samples have different properties: water retention, drainage, capillarity and pH; learners conduct experiments to investigate these properties.  carry out experiments to find the percentage of air, water and humus in a soil sample  understand the importance of air and water in soil to other living organisms(u) | The learner can use a digital camera to capture images to be used in a word-processed experiment or report  The actual (quality) soil types should be used for experiments. | In pairs or groups, learners observe three different soil samples – clay, sand and loam, and:  examine the dry soil samples  Shake the samples in water and allow them to settle to show different layers/ particle sizes.  Pairs/groups record their observations relating to the following characteristics:   * + the colour of each soil sample   + the texture of each soil sample   + the size of particles in each soil sample   Task groups of learners to design, perform and report on investigations to show: retention, drainage and capillarity in loam, clay, and sandy soils. The report for each experiment should follow scientific methods.  In pairs, learners determine the pH of a soil sample and discuss the significance of their findings.  In pairs or groups, learners use practical investigations and/or a set of data to calculate the percentage of air, water, and humus in different soil samples and report conclusions.  In pairs, learners discuss and explain the importance of air and water in soil to living organisms.  **Group Project**  **Aim:**  To investigate whether crop growth is different in different soil types.  Design and carry out an experiment using annual plants in soils with different percentages of contents; e.g. high clay content or | 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  Pg 290-302 |
| 5-7 | **16** | **SOIL EROSION AND CONSERVATION:** **CAUSES, EFFECTS,ANDPREVENTION** | The learner knows how and why soil fertility should be maintained for the soil to continue to be useful to living organisms. | know the features of fertile soil  understand the process of and factors leading to soil erosion  Understand the causes of reduced soil fertility and describe methods of soil conservation.  Understand the importance of microorganisms in the nitrogen and other cycles that keep soil fertile.  Outline the processes involved in the nitrogen cycle. | Learner can use mind mapping or word processing software to relate methods of soil conservation to the principles that apply to them. | In groups, learners discuss conclusions from Topic 2 and agree on a list of the features of fertile soil. Present their conclusions to the class.  In groups, learner’s research on the causes of soil erosion and the impact erosion has on communities. Produce a short presentation to show the types and the possible impact.  In groups, learners discuss what steps farmers and gardeners in their locality take to maintain the fertility of their soils.  Then research and write a report on the different methods used to maintain soil fertility and conserve soil in the following regions of Uganda:   * + - Lake Victoria basin     - Kigezi highlands     - Karamoja region   In groups, learners carry out research into soil organisms that are called decomposers. Produce a short presentation/drama to explain why they are so important.  In groups, learners use labelled cards to role play and explain the nitrogen cycle.  In groups, learners design and carry out an investigation to show the presence of microorganisms in root nodules, soils and compost. Present their findings to the whole class and compare with other groups  **Group Project**: Design, perform and write a report on an investigation into the formation of compost in a compost bin. Report on the process of composting, how fast different materials decompose, any organisms (decomposers) that seem to be involved in the process, and anything else significant or interesting. | Through listening to group discussions, or through whole class discussion, gauge whether all learners understand the features of fertile soils, the causes and  impact of soil erosion, and the steps taken to increase fertility and reduce erosion  Observe groups carrying out activities and check they communicate effectively and work as teams so that everyone is learning and developing skills  Listen to pairs’ conversations and monitor their progress towards learning outcomes. Intervene as appropriate to deepen learning  Observe groups interacting and intervene as appropriate to steer research and project planning so that learning outcomes are achieved  Evaluate quality of products: presentations and reports | New Biology for tropical schools, Stones and Cozens  Pg 290-305 |
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| 8-10 | 11 | NUTRITION TYPES AND NUTRIENTS | The learner understands that organisms have different nutritional requirements, and that humans have different requirements;  depending on age and other factors. | Understand the term nutrition.  Identify the food nutrients, their sources, and importance to humans.  perform food tests for various nutrients (only quality testing required)  appreciate the importance of a diet containing the different nutrients  Appreciate the concept of balanced diet in relation to age, sex, and an individual’s activity.  Appreciate the causes and effects of nutrient deficiency in humans including diseases related to malnutrition.  calculate body mass index (BMI) and explain its implication (s, v)  identify the major plant mineral nutrients (N, P, K, Mg, Ca, S, Mg), their role, and the symptoms of deficiencies. | Use mind mapping or word processing software to categorise food groups and their sources.  Use spreadsheets to record and analyse experimental data.  Use the internet to research on malnutrition.  Carry out food tests. | In pairs, learners brainstorm and research on the meaning of the term nutrition. Share and agree on meaning with the class.  In groups or pairs, learners carry out tests on foods such as potato, egg yolk, milk, groundnuts, and pineapple to determine what main food nutrients they contain.  In groups or as a whole class, learners discuss, research and report on:  The meaning of the term ‘balanced diet’ and what this might mean for a baby, a child, an adult woman and adult, an athlete, and an inactive person. They record their conclusions.  the likely effects of an imbalanced diet  In groups, learners discuss, research and report on the dangers of:  obesity, bulimia and anorexia  use of drugs (diet pills and steroids) to change body image  In groups, learners measure their weight (kg) and height (cm), and use the results to calculate their BMI. With reference to the standard BMI chart they determine their BMI status. They discuss the implications of being underweight and overweight, and what to do in both cases.  Learners listen to a talk or write a short speech on self-esteem in relation to physical differences in body shape and size.  In groups, learners design and perform an experiment to compare the growth of a plant in distilled water and pond water and/or other water rich in nutrients. Learners use scientific method to write a report.  In groups, learners research on the uses of N, P, K, Mg, Ca, S and Mg to plants and the effects of deficiencies. Groups present their findings to the class (illustrated, if possible), with examples of leaves in good health, and showing deficiencies found in the locality. | * Observe groups and pairs carrying out activities. Check they carry out tests and research effectively and plan experiments that will give valid results. * Listen to pairs’ discussions and monitor understanding and progress towards learning outcomes. Ask probing questions to deepen learning   Evaluate quality of products from activities: reports and conclusions from tests and investigations; presentations, and explanations. | Biology, An integrated approach, Soper and Smith  Pg 19-53 |