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| **Learning Planner** | | | | | | | | |
| **Subject** | *General science* | **Week** | | *5* | **Duration** | *180 min* | **Form** | *SHS 1* |
| **Strand** | *EXPLORING MATERIALS* | **Sub-Strand** | | SCIENCE AND MATERIALS IN NATURE | | | | |
| **Content Standard** | Know, understand, and identify the roles of solids in life | | | | | | | |
| **Learning Outcome(s)** | Explain the functions of solids in life. | | | | | | | |
| **Learning**  **Indicator(s)** | Apply the properties of solids to everyday use | | | | | | | |
| **Essential Question(s)** | How does the property of a metal affect it choice and and usage in everday life?  What materials will be needed to demonstrate the choice and usage of metals?  What reason will under-pin the preference of one metal over the other? | | | | | | | |
| **Pedagogical Strategies** | * *Collaborative learning* * *Activity-based learning* * *Research method* * *Demonstration* | | | | | | | |
| **Teaching & Learning Resources** | * *Internet resources such as Massive Open Online Courses (MOOCs); (*[*https://www.youtube.com/watch?v=N4MdZx1fgbA*](https://www.youtube.com/watch?v=N4MdZx1fgbA)*;* [*https://www.youtube.com/watch?v=ZcF8E8aAOGs*](https://www.youtube.com/watch?v=ZcF8E8aAOGs)*;* [*https://www.youtube.com/watch?v=vTq4sgGd2QU*](https://www.youtube.com/watch?v=vTq4sgGd2QU)*)* * *Projectors, etc.* * *Charts* * *Solid substances such as iron nails, plastic bottles, stones, conducting wire etc.* | | | | | | | |
| **Key Notes on Differentiation** | | | | | | | | |
| 1. Learning Task:  * State three uses of solid metals * Explain the relationship between the properties of solid metals and their uses * Write four properties of solid metals * How will you determine the density of different solid materials, etc.  1. Pedagogical Exemplars:  * Learners’ research on how the features of different solids connect to their daily uses from various cultural viewpoints. Let learners reflects and cross share their views and presentations for whole class discussion. * Guide learners to develop concept maps to visualize the relationship between solids, their qualities, and uses. Let learners reflects and cross share their views and presentations for whole class discussion. * Put learners into mixed ability groups to demonstrate their understanding of how various solids are employed based on their qualities through practical activities e.g. electrical conductivity using simple electric circuits. * Assign roles, based on individual strengths, such as researcher, presenter, visual maker, or group facilitator, to encourage active participation and contribution from all learners during the demonstration of practical activities * Learners discuss their results with the class through a variety of presentation alternatives, such as oral presentations, poster displays, multimedia slideshows, or performances, so they can select a format that best suits their strengths and interests, etc.  1. Key Assessments   (DoK):   * Level 1: Provide examples of everyday products that use the electrical conductivity of metals * Level 2: Explain how the high tensile strength of steel contributes to its usefulness in constructing bridges and buildings   Level 2: Discuss the importance of corrosion resistance in selecting materials for outdoor structures and marine environments, etc | | | | | | | | |
| **Keywords** | Solubility, binary, Corrosion etc | | | | | | | |
| **Lesson 1**  **Application of properties of different solid structures in relation to their uses in life.** | | | | | | | | |
| **Main Lesson drawing on Concepts, Skills and Competencies to reinforce as in the Subject Teacher Manual** | | | | | | | | |
| ***Teacher Activity*** | | | ***Learner Activity*** | | | | | |
| **Starter *Activity (10 minutes)***  ***Teacher: Put learners in their mixed groups and mixed gender-group. Ask learners in their groups to name some elements in the periodic table that are metals.***  ***Learners: learners in their mixed groups identify some metals in the Periodic Table*** | | | | | | | | |
| ***Introductory Activity (e.g. 15minutes)***  *I.. Ask learners in their mixed groups to list the properties of metals*  ***Activity 1 (20 minutes)***  *In their mixed groups ask learners to think pair share the relationship between the properties of metals and their uses*  ***Activity 2 (40 minutes)***  I..Guide learners to demonstrate heat conductivity of different metal in their mixed groups  Activity 3  Ask learners to arrange the metals in the order of heat conductivity in their mixed groups,  Activity 4  Guide learners to relate heat conductivity to electrical conductivity of metal in their mixed groups. | | | ***Introductory Activity***  *I..Learners presents their finding in groups on the properties of metals.*  ***Activity 1***  *Leaners in their mixed groups present their results to the class on the properties of metals and their uses*  *Activity 2*  *Learners participated in the demonstration to determine the heat conductivity of different metal*  *Activity 3*  Learners presented their finding on the order of heat conductivity of the different metals. | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| Level 2: Explain how heat conductivity of metals relate to electrical conductivity of the same metals at home and at the work place. | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| *Ask students to think pair share the reason why some metals are not use in constructing cooking utensils.* | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Reflections*  *Lesson was successful* | | | | | | | | |
| **Lesson 2**  **Application of properties of different solid structures in relation to their uses in life.** | | | | | | | | |
| **Main Lesson drawing on Concepts, Skills and Competencies to reinforce as in the Subject Teacher Manual** | | | | | | | | |
| ***Teacher Activity*** | | | ***Learner Activity*** | | | | | |
| **Starter *Activity (10 minutes)***    ***Teacher: Put learners in mixed groups taking into account GESI and SEL***  ***Ask learners to list 5 metal in their mixed groups***  ***Learner: Learners list 5 metals used in their homes and industries*** | | | | | | | | |
| ***Introductory activity (25 minutes)***  Ask learners in their mixed group and mixed gender group to list matrials in their homes made of metals  ***Activity 1 (10 minutes)***  *Ask learners to search on the internet the meaning of corrosion in their mixed-group amd mixed gender groups.*  ***Activity 2 (30 minutes)***  *Ask learners to identify metals that easily corrode and those that do not easily corrode in their mixed group and mixed gender groups.*  ***Activity 3 (15 minutes)***  *Ask learners to discuss the effect of corrosion of metals and their uses in the construction of bridges and buildings in the mixed groups* | | | Learners in their mixed groups and gender groups, presented listed materials in their homes made of metals  ***Activity 1***  *Learners in their mixed groups search the meaning of the word corrosion*  ***Activity 2***  *Learners presented their findings of meatal that easily corrode and those that do not easily corrode.*  **Activity 3**  Learners presented their discussions on the effect of corrosion of metals and their usage in the construction of bridges and buildings, | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| Level 2: Discuss the importance of corrosion resistance in selecting materials for outdoor structures and marine environments, etc | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| *Using think pair share, ask students to brain-storm the factors they will consider in selecting metals for outdoor construction.* | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Reflections*  *Remarks*  *Lessson was successful* | | | | | | | | |