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| **Learning Planner** | | | | | | | | |
| **Subject** | *General science* | **Week** | | *4* | **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)** | * Classify different solids and their uses. | | | | | | | |
| **Essential Question(s)** | How do metals contribute to the structure and function of living orgaism?  What role do metals play in biological processes  What materials will be needed to demonstrate the contribution of metals in biological processes? | | | | | | | |
| **Pedagogical Strategies** | * *Collaborative learning* * *Activity-based learning* * *Research method* * *Nature walk* * *Talk- for learning* | | | | | | | |
| **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* * *Charts* * *Solid substances such as iron nails, plastic bottles, stones etc,.* | | | | | | | |
| **Key Notes on Differentiation** | | | | | | | | |
| 1. Learning task  * Enumerate three properties each of metals, non-metals, and semi-metals * In tabular form, outline four differences between metals and nonmetals * Explain why metal objects should be kept dry and clean?, etc.  1. Pedagogical Exemplars:  * Learners can be grouped in mixed-gender and mixed-ability groups to explore the uses of various solid materials in different structures and substances within their community during a walk around their community (e.g., buildings, vehicles, litter, glass, plastic, construction materials etc.) * Let learners use the internet to research these different solid materials and classify them based on specific criteria using concept maps. Teacher ensures learners classify solid materials into metals, non-metals, semi-metals. Note: there will be some that cannot as they are compounds or mixtures * In mixed groups, discuss the classification of solids into metals, non-metals, semi-metals using their properties. Groups can present their conclusions * Using samples of metals, semi-metals and non-metals, guide learners in pairs to research and distinguish between their properties such as lustre, electrical and thermal conductivity, malleability, ductility, and sonority * Assign learners in separate groups to perform the different practical activities. Let learners present their results to the rest of the class for discussion. * Working in small groups, let learners create a poster which shows the findings from their practical activities, etc.      1. Key Assessments (DoK)  * Level 1: Identify three substances which are solids at room temperature * Level 2: Explain why gold and platinum do not corrode * Level 2: Describe an experiment to explain the conditions necessary for corrosion of iron   Level 3: Describe and explain the differences between metals and non- metals, etc. | | | | | | | | |
| **Keywords** | Structures, periodic table, amorphous solids, etc,. | | | | | | | |
| **Lesson 1**  **Metals, non-metals, and semi-metals** | | | | | | | | |
| **Main Lesson drawing on Concepts, Skills and Competencies to reinforce as in the Subject Teacher Manual** | | | | | | | | |
| ***Teacher Activity*** | | | ***Learner Activity*** | | | | | |
| **Starter *Activity (5 minutes)***  **Teacher: Ask learners to reciet the first twenty elements in the periodic table.**  **Learners: reciete the first twenty elements in the periodic table** | | | | | | | | |
| ***Introductory Activity (e.g 15minutes)***  I. Grouped learners in mixed-gender and mixed-ability groups.  II. Discuss the learning outcomes with learners  III. In their mixed-gender and mixed ability group, lead learners to discuss the key words.  ***Activity 1 (e.g. 20 minutes)***  In their mixed- gender and mixed groups, ask learners to identity structures in their community made of solids  ***Activity 2 (e.g. 20 minutes)***  Ask the learners to search the internet to find out the different solid materials in their mixed groups  ***Activity 3 (e.g. 10 minutes)***  Ask learners to classify the solid materials they searched as metals, non-metals, semi-metals in their mixed group  ***Activity 4 (e.g. 20 minutes)***  In their mixed group ask learners to discuss the properties of metals.  ***Activity 5 (e.g. 20 minutes)***  In groups ask learners to present their findings | | | ***Introductory Activity***  *Learners seated in their*  mixed-gender and mixed-ability groups.  *Learners note down the learning outcomes of the lesson.*  *Learners discuss keywords in their mixed groups.*  *Activity 1*  *I*dentity structures in their community made of solids *and present their findings.*  ***Activity 2***  *Search the internet and identify different solid material.*  *Activity 3*  *Classify the material as metals, non-metals and semi-metals.*  Discuss and write down the properties of metals.  Presented their findings in their groups. | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| * Level 1: Identify three substances which are metal, non-metals and semi-metals * Level 1: Identify five properties of metals * Level 2: Explain why some metals e.g. gold and platinum do not corrode. | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| Using the inside –outside circle, learners share what they learned from the lesson with their colleagues. Offering opportunitites for clarification and correction. | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Reflection:*  *There were inadequate Tablets which delayed the searching of information on the internet.*  *There was also a challenge with internet connectivity, this took a long time to access the internet for information.*  *More Tablets will be acquired to facitlitate fast searching of information on the internet*  *Remarks:*  *Lession was successful.* | | | | | | | | |
| **Lesson 2** | | | | | | | | |
| **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: Ask learners in their mixed groups to write down ten (10) structures that metals are used in their construction.*  *Learners: Presented their findings* | | | | | | | | |
| ***Introductory activity (e.g. 25 minutes)***  I. *Ask learners to discuss the properties of metals and share their reslts with their groups.*  ***Activity 1 (e.g. 15 minutes)***    I. Ask learners to search the meaning of corrosion.  ***Activity 2 (25 minutes)***  I..Ask learners to think-pair share the reason why some metals do not corrode. Call learners to present their discussion. | | | ***Introductory activity***  *Learners share their answers with their friends in the mixed groups*  Learners presented their findings  Learners presented their findings on the reason why some metals do not corrode. | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| Level 2: Explain why some metals e.g. gold and platinum do not corrode. | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| ***Activity (15 minutes)***  *Using the inside –outside circle, learners share what they learned from the lesson with their colleagues. Offering opportunitites for clarification and correction.* | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Lession was successful* | | | | | | | | |