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| **Learning Planner** | | | | | | | | |
| **Subject** | *General science* | **Week** | | *13* | **Duration** | *180 min* | **Form** | *SHS 1* |
| **Strand** | VIGOUR BEHIND LIFE | **Sub-Strand** | | Powering the future with energy forms. | | | | |
| **Content Standard** | Demonstrate understanding of forms of energy, sources, their generation and effects on the environment. | | | | | | | |
| **Learning Outcome(s)** | Relate forms of energy to their sources and their generation | | | | | | | |
| **Learning**  **Indicator(s)** | Describe the generation of electricity from solar cells/panels. | | | | | | | |
| **Essential Question(s)** | In what ways are fossil fuel different from solar energy?  *How can solar panel be used to reduce the over- relaiance on fossil fuel in Ghana?*  *What materials will be needed to demonstrate to learners the various forms of energy?* | | | | | | | |
| **Pedagogical Strategies** | * Collaborative learning * Talk-for-learning approach * Demonstration | | | | | | | |
| **Teaching & Learning Resources** | * Prototypes of solar panels * Charts, pictures, and simulations of various forms of electricity generation. * Internet resources such as (https://www.youtube.com/watch?v=9BgDt407uQc; https://www.youtube.com/watch?v=lxoHqV2fMK4) * Different appropriate materials from the environment. | | | | | | | |
| **Key Notes on Differentiation** | | | | | | | | |
| *Learning Task*   * Give at least three (3) examples of fossil fuel. * In what way is solar energy different from energy from fossil fuels? * Explain ways solar panels can reduce reliance on fossil fuels in Ghana.   *ii. Pedagogical Exemplars*   * *Engage learners in a structured discussion by revising various forms of electricity generation from the junior high school curriculum (B7.4.2.1.1) related to solar energy.* * *Encourage active participation, question and answer sessions, and peer-to-peer explanations to consolidate understanding and enhance retention.* * *Organize learners into groups to prepare and deliver presentations on the topic of solar energy.* * *Provide guidelines on content, format, and presentation skills to ensure clarity and engagement.* * *Guide learners to use the diamond nine strategy to come out meaning, advantages, and disadvantages of solar energy in relation to life and the environment.* * *Encourage critical thinking, collaboration, and prioritization of ideas within the group.* * *Support learners in creating concept maps, videos, pictures, charts, and diagrams to visually represent their findings and understanding of solar energy.* * *Introduce internet resources for research and exploration, allowing learners to deepen their knowledge and expand their perspective.* * *Provide flexibility in the group formation to cater to different learning and abilities, ensuring each group is balanced in terms of skill levels.* * *Offer alternative presentation formats for learners who may struggle with traditional methods, such as creating digital presentations or interactive posters.* * *Tailor guidance and support according to individual needs, offering additional explanations, resources, or examples as required., etc.*   *iii. Key Assessment (DoK):*   * *Explain the concept of fossil fuel.* * *Explain at three factors to consider when installing solar panel in Ghana.* * Describe how solar panels reduce the reliance on fossil fuels in Ghana. | | | | | | | | |
| **Keywords** | Direct Current, alternating Current, electrons, solar, photons, current, electricity, etc | | | | | | | |
| **Lesson 1**  **Theme and Focal Area: How Solar Panel Reduce the Reliance on Fossil Fuel** | | | | | | | | |
| **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 to receite the Rhymn Twinkle, twitkle little Stars,***  ***Learners: Receite the Poem: Twinkle Twinkle little Stars*** | | | | | | | | |
| ***Introductory Activity (15minutes)***  *Put learners in mixed gender and mixed ability groups and*  *ask them to come out of the class to observe the sun.*  ***Activity 1 (e.g. 40 minutes)***  *Ask learner to search the internet using their tablets to note down the froms of energy in their mixed gender and mixed ability groups.*  ***Activity 2 (e.g 30 minutes)***  *Ask learners to brainstorm and come out with the difference between fossil fuel and solar energy.*  *Activity 3*  *Display**some fossil fuel and Solar Panel for learners to discuss the advantages of Fossil fuel and the Solar Panel in their mixed ability groups.*  ***Activity 3***  ***Teacher clear misconceptions and correct them.*** | | | ***Introductory Activity***  *Learners come out to observe the Sun in their mixed ability groups*  ***Activity 1***  *Search the internet to note down the froms of energy in their mixed gender and mixed ability group.*  ***Activity 2***  *Brainstorm and come out with the difference between fossil fuel and solar energy*  Activity 3  Note down the advantages of Fossil Fuel *and Solar Panel in their mixed ability groups.* | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| ***Level 2:*** *Explain the concept of fossil fuel.*  ***Level 2: Examine some advantages of Solar energy over fossil fuel.*** | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| ***Activity (15 minutes)***  *Using Pass-that-question, ask learners to write any question on the lesson.*  *Summarize the lesson highlighting the salient points.* | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Reflection:*  *Remarks:* | | | | | | | | |
| **Lesson 2**  **Theme and Focal area: How Solar Panel Reduce the Reliance on Fossil Fuel** | | | | | | | | |
| **Main Lesson drawing on Concepts, Skills and Competencies to reinforce as in the Subject Teacher Manual** | | | | | | | | |
| ***Teacher Activity*** | | | ***Learner Activity*** | | | | | |
| **Starter *Activity (10 minutes)*** | | | | | | | | |
| ***Introductory activity (25 minutes)***  *Engage learners in a structured discussion by revising various forms of electricity generation from the previous lesson in their mixed gender and mixed ability group.*  ***Activity 1 (e.g. 40 minutes)***  *Organize learners into groups to prepare and deliver presentations on the Solar Energy and how to reduce over-reliance on fossil fuel.* | | | ***Introductory activity***  *Discussion by revising various forms of electricity generation in their mixed ability groups..*    ***Activity 1***  *Deliver presentations on the Solar Energy and how to reduce over-reliance on fossil fuel.* | | | | | |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | | | | | | | | |
| ***Level 3:*** Describe how the use of solar panels can reduce the reliance on fossil fuels in Ghana. | | | | | | | | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | | | | | | | | |
| ***Activity (15 minutes)***  *Using Pass-that-question, ask learners to write any question on the lesson.*  *Summarize the lesson highlighting the salient points.* | | | | | | | | |
| **Reflection & Remarks** | | | | | | | | |
| *Reflection:*  *Remarks* | | | | | | | | |