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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
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| **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.
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| **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.
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| **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* |