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| **Learning Planner** | | | | | | | |
| **Subject** | *General science* | **Week** | *2* | **Duration** | *180 min* | **Form** | *SHS 1* |
| **Strand** | *EXPLORING MATERIALS* | **Sub-Strand** | SCIENCE AND MATERIALS IN NATURE | | | | |
| **Content Standard** | Demonstrate knowledge and understanding of the characteristics of science and show how they are applied in everyday life. | | | | | | |
| **Learning Outcome(s)** | Evaluate the characteristics of science | | | | | | |
| **Learning**  **Indicator(s)** | Design projects using the characteristics of science | | | | | | |
| **Essential Question(s)** | In what ways can science influence food production and consumption?  How does scientific innovation impact daily routine?  What role does science play in addressing environmental challenges? | | | | | | |
| **Pedagogical Strategies** | * *Collaborative learning* * *Demonstration* * *Project-based learning* | | | | | | |
| **Teaching & Learning Resources** | * *Projectors* * *Poster pictures showing scenarios in which the characteristics of science are displayed. (E.g.* [*https://evolution.berkeley.edu/nature-of-science/characteristics-of-science*](https://evolution.berkeley.edu/nature-of-science/characteristics-of-science)*/and* [*https://www.sciencebuddies.org/science-fair-projects/project-ideas/list*](https://www.sciencebuddies.org/science-fair-projects/project-ideas/list) *)* * *Internet sources* [**www.gesi360.com**](http://www.gesi360.com) | | | | | | |
| **Key Notes on Differentiation** | | | | | | | |
| 1. *Learning task:*  * *Identify three steps involved in designing science projects* * *Describe how to design science-based projects using the characteristics of science. Design a science-based project using characteristics of science* * *Give an example of designing science-based projects where the characteristics of science can be identified, etc.*  1. *Pedagogical Exemplars:*  * *Provide videos, charts, diagrams, and pictures for learners on designing science-based projects using the characteristics of science in nature* * *In mixed-ability groups, learners discuss the step-by-step science characteristics used in videos, charts, diagrams, and pictures to design the project* * *Demonstrate how the characteristics of science (empiricism, systematic observation, objectivity, tentativity) are used in designing a project for the learners* * *In mixed-ability groups, provide hands-on experimentation for learners on characteristics of science. Allow learners to explain the characteristics of science demonstrated in the experiment. For example, an experiment to show the empirical nature of science* * *Learners present their findings from the experiment to the class for peer review or critique* * *Encourage learners to seek feedback from peers and teachers, iterate on their designs, and reflect on the iterative design process to enhance learning outcomes, etc.*  1. *Key Assessments (DOK):*  * *Level 2: Describe the characteristics of science when designing a scientific project* * *Level 3: Identify three characteristics of science and discuss how each can enhance the effectiveness of a scientific project's design* * *Level 4: Why is gathering and analysing data during the design process essential? Provide examples of how empirical evidence can influence design decisions, etc.* | | | | | | | |
| **Keywords** | Methodical  Consistency  Accuracy | | | | | | |

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| **Lesson 1**  **Theme/Focal Area**  **Characteristics of Science in Nature** | |
| **Main Lesson drawing on Concepts, Skills and Competencies to reinforce as in the Subject Teacher Manual** | |
| ***Teacher Activity*** | ***Learner Activity*** |
| **Starter *Activity (10 minutes)***  **Ask learners to stand up and clap**  **Learner:**  **Stand and clap** | |
| ***Introductory Activity (e.g. 15minutes)***   1. Boil water and put thermometer inside and ask learners to observe   ***Activity 1 (e.g. 40 minutes)***   1. *Ask Learners in their mixed ability groups to search for the characteristics of Science and their meaning using their tablets connected to the internet*   ***Activity 2 (e.g 40 minutes)***      ***ask learners to appoint a leader to present their findings to the class***  ***ii. summarise their findings and clear misconceptions and wrong answwers*** | ***Introductory Activity)***   1. *Observe the boiling water and read the temperature*   ***Activity 1)***   1. *Search fort the characteristics of Science and their meaning using their tablets connected to the internet*   ***Activity 2***   1. ***appoint a leader to present their findings to the class***   *ii. Pay attention and make note* |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | |
| * *2: Describe the characteristics of science when designing a scientific project* * *Level 3: Identify three characteristics of science and discuss how each can enhance the effectiveness of a scientific project's design*   *Level 4: Why is gathering and analysing data during the design process essential? Provide examples of how empirical evidence can influence design decisions, etc* | |
| **Lesson Closure**  ***In completing this part, refer to the Essential Questions to check that learning has taken place.*** | |
| ***Activity (e.g.15 minutes)***  *Ask learners to think-pair share the characteristics of Science.*   * *Ask learners to Identify three characteristics of science and discuss how each can enhance the effectiveness of a scientific project's design* | |
| **Reflection & Remarks** | |
| *Tablets were few so students had to share, which delayed the lesson.* | |
| **Lesson 2**  **Theme/Focal Area**  **Characteristics of Science in Nature** | |
| **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:***    **Go for a dustbin ask learners to go for 3 pebles each. The teacher asked the learners to throw the pebbles into the bin to check accuracy and precision**  **Learner: throw their pebbles from a specific point into the Bin one after the other** | |
| ***Introductory activity (e.g. 10 minutes)***   1. ***Guide learners to discuss the keywords and the learning outcomes with their learning partners***   ***Activity 1 (25 minutes)***     1. *Share the characteristics of science among mixed-ability groups, to search for their appilication and discuss them with the group members.* 2. *Let learners assess other group members’ contributions during the presentation*   ***Activity 2 (30 minutes)***   1. *Take learners to the school field to sample some organism using the Quadrat* | ***Introductory activity)***  *Discuss the lesson keywords and the learning outcome with your learning partners*    *Search, discuss and present the characteritice of science, giving real-life application in your mixed ability group*  ***Learners analyze the findings of other groups during the presentation***  ***Activity 3***   1. Sample living organisms using the Quadrat, discuss with your learning partners the Characteristice of Science you used and how you applied it. |
| **Assessment DoK aligned to the Curriculum and Subject Teacher Manual** | |
| **Level 2: Explain how two characteritics of science are applied in schools and industries**  **Level 3: analyse two situations in the home where the characteristics of science can be applied.** | |
| **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.*  *Using the exit card ask learners to write down activities of science they learn.*  *Assign activities for the next lesson:*  *Ask learners to write down activities they perform at home/dormitory and the characteristics of science they applied.* | |
| **Reflection & Remarks** | |
| *What went well during the lesson delivery?*  *Were the learners able to explain the application of the Characteristics of science in everday life?*  *Did the activities performed during the lesson answer the essential questions?* | |