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| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| STEAM Integration in Environmental Education | Science in Environmental Studies | The Role of Science in Understanding and Solving Environmental Challenges |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This activity is designed to highlight the integral role of scientific inquiry and methodologies in addressing environmental issues. Students will explore how scientific principles are applied to understand and solve real-world environmental problems, focusing on areas such as climate change, biodiversity, and pollution. |
| **SETTING** | Location: Classroom equipped with computers, internet access, and multimedia capabilities.  Educational Context: Collaborative group work (2-3 students per group). |

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| Materials Needed |
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| **Materials Needed** | Computers with internet access  Projector and screen for video presentations  Scientific journals and online databases for research  Lab equipment for small-scale experiments (optional) |

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| **Learning Outcomes** | * Develop a deep understanding of the scientific methods used in environmental studies. * Apply scientific principles to analyze and propose solutions to environmental problems. * Enhance communication and teamwork skills through collaborative research and presentations. |  |
| **Activity Contents** | **Theoretical Part (Duration: 60 minutes)**: Start with an in-depth exploration of how science underpins environmental education. Discuss key scientific disciplines such as ecology, environmental chemistry, geology, and their roles in understanding the environment.   * **Key Concepts Covered**:   + The scientific method and its application in environmental research.   + How ecological studies help in understanding biodiversity and ecosystem services.   + The role of environmental chemistry in assessing pollution and its impacts. * **Video Resources**:   + "Science in Environmental Decision-Making" (<https://www.youtube.com/watch?v=exampleLink1>) – Explains how scientific data informs policies and decisions in environmental management.   + "Interdisciplinary Science in Solving Environmental Problems" (<https://www.youtube.com/watch?v=exampleLink2>) – Showcases examples of how various scientific disciplines collaborate to address complex environmental issues.   **Task 1: Scientific Analysis of an Environmental Issue (Duration: 70 minutes)** **Step 1**: Each group selects an environmental issue such as air pollution, water quality, or loss of biodiversity. They research the issue using scientific databases and journals to gather relevant data and studies.  **Step 2**: Prepare a detailed report that includes:   * A description of the environmental issue, backed by scientific data. * Analysis of the factors contributing to the issue using scientific principles. * Review of current scientific approaches being used to address the issue. **Step 3**: Present their findings in a well-organized presentation, using visuals like graphs, charts, and maps to support their data.   **Task 2: Designing a Scientific Experiment or Study (Duration: 60 minutes)** **Step 1**: Based on their earlier research, each group designs a small-scale scientific experiment or observational study that could provide further insights into the environmental issue they are studying.  **Step 2**: Outline the experiment/study proposal that includes:   * Hypothesis or research questions. * Methodology: detailing the experimental setup or observational techniques. * Expected outcomes and how they will contribute to solving the environmental issue. * Considerations of ethical and practical implications.   **Step 3**: Each group pitches their experimental design to the class, receiving feedback on the feasibility and scientific rigor of their proposed methods. |  |
| **Assessments** | Depth and accuracy of scientific research.  Innovation and feasibility of the experimental design.  Clarity, coherence, and scientific accuracy in presentations.  Active participation and teamwork. |  |
| **Key Competences** | Scientific literacy and critical thinking  Research and data analysis skills  Problem-solving and experimental design  Effective communication and collaborative learning |  |
| **Connections with Eco STEAM** | Eco Science: Core focus on using scientific inquiry to understand and address environmental issues.  Technology: Utilizing modern technology for data collection and analysis.  Engineering: Applying engineering principles in experimental setup and solution development.  Arts: Employing creative approaches to present scientific data effectively.  Math: Using statistics and mathematical models to interpret data and predict outcomes. |  |
| **References** | www.journalofenvironmentalsciences.com |  |
| **Notes** | Extend this activity into a project-based learning module, where students can actually conduct their proposed experiments if feasible. |  |

**Evaluation Table for Science in Environmental Studies Activity**

| **Evaluation Criteria** | **Points Available** | **Comments** |
| --- | --- | --- |
| **1. Depth of Scientific Research** | 20 | Evaluate the thoroughness and depth of the scientific research conducted on the selected environmental issue. |
| **2. Accuracy of Scientific Data** | 15 | Assess the accuracy and relevance of the scientific data presented in the reports. |
| **3. Innovation in Experimental Design** | 15 | Rate the creativity and innovation in the design of the proposed experiment or study. |
| **4. Methodology Clarity** | 15 | Judge how clearly the experimental or study methodology is planned and presented. |
| **5. Analysis and Interpretation** | 15 | Evaluate the rigor and depth of the analysis and interpretation of data in their reports and presentations. |
| **6. Presentation Skills** | 10 | Assess the effectiveness of the presentation in terms of clarity, organization, and use of visual aids. |
| **7. Team Collaboration** | 10 | Rate the level of effective collaboration and contribution from all team members throughout the project. |

**Total Points:** 100