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| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| Creative and Critical Thinking in EcoSTEAM Education | Economic Impacts of Environmental Practices | Green Innovation Challenge |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This activity involves students participating in a Green Innovation Challenge where they design and prototype eco-friendly products or practices. The focus is on assessing the economic impacts of their innovations, including cost-effectiveness, market potential, and sustainability. |
| **SETTING** | Location: Classroom for planning and prototyping, online resources for research.  Educational Context: Collaborative group work. |

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| Materials Needed |
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| **Materials Needed** | Research materials (books, articles, internet access)  Prototyping materials (recycled materials, craft supplies, basic tools)  Economic analysis tools (spreadsheets, cost-benefit analysis templates)  Presentation tools (e.g., PowerPoint, poster boards)  Whiteboard and markers |

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| **Learning Outcomes** | * Develop innovative thinking and prototyping skills. * Enhance understanding of the economic impacts of eco-friendly products and practices. * Improve abilities in market analysis, economic assessment, and presentation. |  |
| **Activity Contents** | **Theoretical Part (Duration: 60 minutes)**: Begin with a detailed introduction to green innovation and the economic impacts of eco-friendly products and practices.   * **Introduction to Green Innovation**:   + Green innovation refers to the development of new products, services, or processes that reduce environmental impacts, enhance resource efficiency, and contribute to sustainable development. Examples include renewable energy technologies, sustainable agricultural practices, and eco-friendly consumer products.     - Discuss the growing importance of green innovation in today's world, driven by increasing environmental awareness, regulatory pressures, and market demand for sustainable solutions.     - Explain how green innovation can drive economic growth by creating new markets, reducing costs through efficiency improvements, and enhancing competitiveness.   + **Case Studies of Successful Green Innovations**:     - Discuss how Tesla's electric cars have revolutionized the automotive industry by offering a sustainable alternative to traditional gasoline-powered vehicles. Highlight the economic benefits, including cost savings on fuel and maintenance, job creation in the green technology sector, and market growth.     - Explain the economic impacts of solar energy adoption, such as reduced energy costs for consumers, job creation in the solar installation and manufacturing industries, and long-term environmental benefits that translate into economic savings.     - Explore how sustainable farming practices, such as organic farming and permaculture, can increase crop yields, reduce input costs, and enhance soil health, leading to long-term economic and environmental benefits. * **Economic Impacts of Green Innovations**:   + Explain the concept of cost-benefit analysis (CBA) as a tool for evaluating the economic viability of green innovations. Discuss how CBA involves comparing the costs of implementing a green innovation (e.g., initial investment, operational costs) with the expected benefits (e.g., cost savings, revenue generation, environmental improvements).     - Provide a detailed example of a cost-benefit analysis for a hypothetical green innovation, such as installing solar panels on a commercial building. Outline the steps involved in conducting the analysis, including identifying costs and benefits, quantifying them in monetary terms, and calculating key metrics such as net present value (NPV) and return on investment (ROI).   + Discuss the market potential of green innovations and their economic benefits. Explain how green innovations can create new business opportunities, attract investment, and generate revenue. Highlight the role of government policies, subsidies, and incentives in supporting the adoption and commercialization of green innovations.   **Discussion Prompts**:   * What are some examples of green innovations that have had a significant economic impact? * How can eco-friendly products be made cost-effective and marketable? * What challenges do innovators face when developing sustainable products?   **Task 1: Green Innovation Design (Duration: 90 minutes)** **Objective**: To design and prototype eco-friendly products or practices.  **Steps**:   1. Divide students into groups, each tasked with designing an innovative eco-friendly product or practice. 2. Conduct a brainstorming session to generate ideas for green innovations. Use mind maps or idea boards to visualize concepts. 3. Develop detailed designs and create prototypes using recycled materials and basic tools. Consider factors such as functionality, sustainability, and cost.   **Task 2: Economic Analysis and Market Potential (Duration: 120 minutes)** **Objective**: To analyze the economic impacts and market potential of the designed innovations.  **Steps**:   1. Research the potential market for the designed product or practice, including target audience, competitors, and market trends. 2. Use economic analysis tools (e.g., cost-benefit analysis templates) to assess the cost-effectiveness, pricing, and potential economic benefits of the innovation. 3. Develop a market plan that includes pricing strategies, marketing approaches, and distribution channels.   **Task 3: Presentation and Feedback (Duration: 60 minutes)** **Objective**: To present the innovations and receive feedback from peers and instructors.  **Steps**:   1. Each group creates a presentation that showcases their innovation, economic analysis, and market plan. Use visual aids such as slides, posters, or prototypes. 2. Present the innovations to the class, highlighting key features, economic impacts, and market potential. 3. Engage in a Q&A session where peers and instructors provide feedback and ask questions. Discuss potential improvements based on the feedback received. |  |
| **Assessments** | Creativity and innovation in the design and prototype.  Thoroughness of economic analysis and market potential assessment.  Clarity and effectiveness of the presentation.  Ability to defend innovations during the Q&A session.  Team collaboration and participation. |  |
| **Key Competences** | Creative thinking and innovation  Research and market analysis skills  Economic assessment and data interpretation  Effective communication and presentation skills  Teamwork and collaboration |  |
| **Connections with Eco STEAM** | Eco: Designing and assessing eco-friendly products and practices.  Science: Applying scientific principles to develop sustainable innovations.  Technology: Utilizing digital tools for research and prototyping.  Engineering: Creating functional and sustainable prototypes.  Arts: Creatively presenting innovations and market plans.  Math: Conducting economic assessments and market analysis. |  |
| **References** | https://www.velocityokc.com/blog/member-news/the-economic-benefits-of-implementing-green-practices-in-the-workplace/ |  |
| **Notes** | This activity can be extended into a longer-term project, where students further develop and test their prototypes and market plans.  Encourage students to engage with local businesses or environmental organizations for real-world insights and feedback. |  |

**Evaluation Criteria Table for Green Innovation Challenge**

| **Evaluation Criteria** | **Points Available** | **Comments** |
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| **1. Creativity and Innovation in Design and Prototype** | 20 | Assess the originality and creativity of the designed product or practice. |
| **2. Thoroughness of Economic Analysis and Market Potential Assessment** | 20 | Evaluate the depth and accuracy of the economic analysis and market potential assessment. |
| **3. Clarity and Persuasiveness of the Presentation** | 20 | Rate the clarity, persuasiveness, and engagement level of the presentation given by each group. |
| **4. Ability to Defend Innovations During Q&A Session** | 20 | Assess the quality and relevance of responses during the Q&A session and the ability to defend innovations. |
| **5. Team Collaboration and Participation** | 20 | Evaluate the level of teamwork, communication, and participation among group members throughout the activity. |

**Total Points:** 100