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| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| Creative and Critical Thinking in EcoSTEAM Education | Design Thinking for an Eco-Friendly Solution | Let’s make it Eco-friendly |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This activity involves students using design thinking to develop an eco-friendly solution to a common environmental challenge. The focus is on creative and critical thinking, encouraging students to generate innovative ideas and practical solutions through a structured process. |
| **SETTING** | Location: Classroom for discussion and brainstorming, online resources for research.  Educational Context: Individual or small group activity. |

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| Materials Needed |
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| **Materials Needed** | Research materials (books, articles, internet access)  Design thinking tools (whiteboard, markers, sticky notes)  Prototyping materials (optional: craft supplies, recycled materials)  Presentation tools (e.g., PowerPoint, poster boards) |

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| **Learning Outcomes** | * Develop skills in design thinking and creative problem-solving. * Enhance understanding of the role of creativity in addressing environmental issues. * Improve abilities in brainstorming, idea generation, and presenting solutions. |  |
| **Activity Contents** | **Theoretical Part (Duration: 30 minutes)**: Provide a detailed introduction to design thinking and its application in creating eco-friendly solutions.   * **Introduction to Design Thinking**:   Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success. It involves empathizing with users, defining problems, ideating solutions, prototyping, and testing.  Designing a reusable shopping bag. By understanding the needs of shoppers and the environmental impact of plastic bags, students can create innovative reusable bags that are both functional and eco-friendly.   * + **Stages of Design Thinking**:     - Understand the needs and challenges of the users. For example, interview people to learn about their shopping habits and the difficulties they face with existing reusable bags.     - Clearly articulate the problem you want to solve. For instance, "Create a durable, convenient, and eco-friendly reusable shopping bag."     - Generate a wide range of ideas and potential solutions. Encourage creativity and think outside the box. For example, brainstorm different materials, designs, and features for the bag.     - Develop a simple, tangible representation of one or more of your ideas. This could be a sketch, model, or digital prototype of the bag.     - Share your prototype with others to get feedback and refine your solution. For example, have people use the prototype bag and provide feedback on its design and functionality.   + **Key Principles of Design Thinking**:     - Focus on the needs and experiences of the users.     - Work with others to gain diverse perspectives and ideas.     - Create prototypes and test them to learn and improve.     - Continuously refine and improve your solution based on feedback. * **Video Resources**:   + "Introduction to Design Thinking" https://www.youtube.com/watch?v=gHGN6hs2gZY   **Discussion Prompts**:   * How can design thinking be used to solve environmental problems? * What are the benefits of using a user-centered approach in designing eco-friendly solutions? * How can feedback and iteration improve the quality of your solution?   **Task 1: Empathize and Define (Duration: 45 minutes)**.  **Steps**:   1. Conduct interviews or surveys to gather insights about users' needs and experiences related to the chosen environmental challenge (e.g., plastic waste, energy consumption). 2. Analyze the data collected and clearly define the problem. Create a problem statement that reflects the users' needs and the environmental impact.   **Task 2: Ideate (Duration: 45 minutes)**  **Steps**:   1. Conduct a brainstorming session to generate as many ideas as possible. Use techniques like mind mapping or SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Rearrange) to stimulate creativity. 2. Evaluate and select the most promising ideas based on criteria such as feasibility, impact, and user feedback.   **Task 3: Prototype and Test (Duration: 60 minutes)** **Steps**:   1. Create simple prototypes of the selected ideas. Prototypes can be sketches, models, or digital representations. 2. Share the prototypes with peers or potential users to gather feedback. Use the feedback to refine and improve the solutions.   **Task 4: Presentation (Duration: 30 minutes)** **Steps**:   1. Create a presentation that showcases the problem, the design thinking process, the prototypes, and the final solution. 2. Present the solution to the class, highlighting the key insights and the impact of the solution. 3. Engage in a Q&A session where peers and instructors provide feedback and ask questions. |  |
| **Assessments** | Effectiveness of applying design thinking to solve the environmental problem.  Creativity and innovation of the developed solution.  Clarity and persuasiveness of the presentation.  Ability to incorporate feedback and improve the solution.  Individual or team participation and collaboration. |  |
| **Key Competences** | Design thinking and creative problem-solving skills  Empathy and user-centered design  Research and data analysis  Prototyping and testing  Effective communication and presentation skills |  |
| **Connections with Eco STEAM** | Eco: Developing eco-friendly solutions through design thinking.  Science: Applying scientific principles to understand the environmental impact.  Technology: Utilizing design tools and techniques.  Engineering: Creating and refining prototypes.  Arts: Creatively presenting solutions.  Math: Analyzing data and evaluating solutions. |  |
| **References** | https://www.interaction-design.org/literature/topics/design-thinking#:~:text=Design%20thinking%20is%20a%20non,%2C%20Ideate%2C%20Prototype%20and%20Test. |  |
| **Notes** | Encourage students to think creatively and consider unconventional ideas.  Provide support and guidance throughout the design thinking process.  Use the feedback to continuously improve the activity. |  |

**Evaluation Criteria Table for Using Design Thinking for an Eco-Friendly Solution**

| **Evaluation Criteria** | **Points Available** | **Comments** |
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| **1. Effectiveness of Applying Design Thinking** | 20 | Assess how well the student applied the design thinking process to develop the solution. |
| **2. Creativity and Innovation of the Developed Solution** | 20 | Evaluate the creativity and innovation demonstrated in the developed solution. |
| **3. Clarity and Persuasiveness of the Presentation** | 20 | Rate the clarity, persuasiveness, and engagement level of the presentation given by the student. |
| **4. Ability to Incorporate Feedback and Improve Solution** | 20 | Assess the student's ability to incorporate feedback and improve the solution. |
| **5. Individual or Team Participation and Collaboration** | 20 | Evaluate the level of individual or team participation and collaboration throughout the activity. |

**Total Points:** 100

**Interview Guide for Gathering Insights on Environmental Challenges**

**Objective**: To understand the needs and experiences of users related to a specific environmental challenge.

**Chosen Environmental Challenge**: Plastic Waste

**Interview Guide**

**1. Introduction**

* Introduce yourself and the purpose of the interview.
* Explain the chosen environmental challenge (e.g., plastic waste).
* Assure the interviewee that their responses will be kept confidential and used only for educational purposes.
* Obtain consent to record the interview (if applicable).

**2. General Questions**

1. **Can you tell me a little about yourself?**
   * (e.g., age, occupation, hobbies)
2. **How aware are you of the environmental issues related to plastic waste?**
   * (e.g., very aware, somewhat aware, not aware)
3. **How important do you think it is to address the issue of plastic waste?**
   * (e.g., very important, somewhat important, not important)

**3. Current Practices and Experiences** 4. **How often do you use plastic products in your daily life?**

* (e.g., daily, weekly, occasionally)

1. **What types of plastic products do you use most frequently?**
   * (e.g., plastic bags, bottles, packaging)
2. **Have you ever tried to reduce your use of plastic? If so, how?**
   * (e.g., using reusable bags, avoiding single-use plastics)
3. **What challenges have you faced in reducing your plastic use?**
   * (e.g., convenience, availability of alternatives, cost)
4. **Have you participated in any initiatives or programs to reduce plastic waste? If so, what were they?**
   * (e.g., recycling programs, community clean-ups)

**4. User Needs and Preferences** 9. **What features would you like to see in an alternative to single-use plastic products?**

* (e.g., durability, affordability, convenience)

1. **What would motivate you to switch to eco-friendly alternatives to plastic?**
   * (e.g., incentives, awareness campaigns, availability of products)
2. **How do you think businesses and governments can support individuals in reducing plastic waste?**
   * (e.g., policies, providing alternatives, education)
3. **What role do you think technology can play in addressing the issue of plastic waste?**
   * (e.g., developing new materials, improving recycling processes)

**5. Closing Questions** 13. **Is there anything else you would like to share about your experiences or views on plastic waste?**

1. **Would you be interested in participating in future discussions or projects related to environmental sustainability?**