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| Activity plan | | | | |
| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| 1. Environmental Awareness and Conservation | 1.4. Sustainable living and technologies | Dyeing with natural dyes |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This session is designed to explore the use of natural materials for dyeing fabric or other materials (optional boiled eggs). Creating art with natural dyes can be a rewarding and environmentally friendly activity.  The activities are structured to provide a rich blend of theoretical knowledge and practical fieldwork; students engage in a hands-on exploration of natural dyeing, fostering creativity, environmental consciousness, and appreciation for traditional art practices. |
| **SETTING** | Classroom complemented by digital research. |

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| Materials Needed |
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| **Materials Needed** | Various natural dye materials (e.g., onion skins, turmeric, spinach, beets, berries, coffee grounds, avocado pits, red cabbage, flower from hibiscus, walnut leaves etc.)  - Fabric or clothing items to dye (cotton, linen, silk, wool or optional boiled eggs); large pots or containers for dyeing; water, also vinegar or other compounds (optional, for fixing dye); stainless steel or enamel pots (intended for dyeing), stirring utensils; strainers or cheesecloth; rubber gloves (optional); aprons or old clothing to protect against stains; access to a stove or heat source; plastic wrap or bags for wrapping dyed items (optional); labels or tags for identifying dye materials and colors. |

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| **Learning Outcomes** | * Understanding the concept of dyeing materials with natural colors as well as its historical significance and role in environmental preservation, increasing creativity among students to find as many natural colors as possible and ways of coloring with them; * Enhancing skills in digital research and data analysis; * Improving ability to critically analyze and discuss the significance of the use of natural colors to preserve the environment; |  |
| **Activity Contents** | **Activity1 Steps – (**Duration: 1-2 hours for dyeing process, additional time for preparation and cleanup)  **Activity( The process of dyeing with natural dyes)**  **Theoretical part 1: (15 minutes)**  The teacher introduces to students the concept of natural dyeing and its historical significance, as well as a variety of natural dye materials. Then they discuss the environmental benefits of using natural dyes compared to synthetic dyes, emphasizing sustainability and eco-friendliness.  Students watch this video  <https://www.youtube.com/watch?v=Gwk1B66dvAM>  Duration: (5min 28 sec)  Overview: In the video are given different examples of dyeing with natural dyes  **Task 1: (30 minutes)**  Students choose the materials they are most interested in experimenting with. Class is divided into small groups or pairs, assigning each group a different natural dye material.  The teacher gives a task to the students to prepare their dye baths by adding the chosen dye materials to pots of water and bringing them to a simmer. Optionally, they add vinegar or other compounds to the dye baths to help fix the colors.  **Task 2: (45-60 minutes)**  The teacher gives instructions about the dyeing process, rinsing and finishing.  Students use fabric or clothing items or boiled eggs to dye - they wet the fabric beforehand to help the dye penetrate evenly, then submerge the fabric or egg in the dye bath, ensuring that it is fully immersed.  Students let the fabric or egg to simmer in the dye bath for an extended period, periodically stirring to ensure even dye distribution. (varying lengths of time, depending on the desired intensity of color)  When dyeing is finished, students rinse the fabric/egg thoroughly under cold water to remove excess dye (optionally, wash the dyed fabric with mild detergent to remove any remaining dye particles.)  Students place the fabric to air dry, avoiding direct sunlight to prevent color fading.  **Task3: Evaluation and reflection, cleanup (20 minutes)**  The teacher gives a task to students to evaluate their working process and to clean up the workspace.  Once the dyed fabric has dried, students evaluate their results and reflect on the dyeing experience - the colors obtained, the effectiveness of different dye materials, and any challenges encountered during the process.  Students clean up their workspaces, rinsing pots and utensils and properly disposing of any leftover dye materials.  **Additional Tips:**  The teacher empowers students research about color theory and mixing to create harmonious color combinations.  Students may consider incorporating natural dyeing into other art projects such as tie-dyeing, batik, or fabric painting for added versatility.  The teacher emphasizes safety precautions when working with heat and dye materials, and encourages students to wear protective clothing and gloves if necessary.  The teacher could showcase the finished dyed items in a display or exhibition to celebrate students' creativity and promote awareness of natural dyeing techniques. |  |
| **Assessments** | * Assessment of Web Quest reports for depth of research and understanding. * Evaluation of the thoroughness and accuracy of practical observation records. * Group presentations synthesizing practical inventions, with a focus on which color is the most intense, which color is the most beautiful, etc. |  |
| **Key Competences** | * Cognitive competence * Cultural competence * Creativity competence |  |
| **Connections with Eco STEAM** | **Eco**- environmental awareness, and appreciation for traditional art practices  **S**cience - ecological science (studying chemistry of natural colors)  **T**echnology- use of digital tools for research  **E**ngineering –coloring different materials with ancient methods  **A**rts - developing creativity through the use of natural materials for coloring  **M**ath- data analysisabout the degree of coloring using different materials |  |
| **References** | •Academic and scientific literature on about dyeing with natural colors, how different materials are dyed, does the temperature affect the dyeing, does the standing time affect the intensity of the color.  •Online databases and resources for dyeing materials with natural colors research. |  |
| **Notes** | •The practicalworkshop should be adaptable to different local natural dyeing materials.  •Emphasize safety and ethical conduct during practical work and observation.  •Encourage students to reflect on their role in environment conservation and the importance of sustainable practices. |  |

**Assessment Table for Web Quest Reports:**

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| Assessment Criteria | Points | Comments |
| Depth of Research | \_\_/5 |  |
| Understanding of natural colors | \_\_/5 |  |
| Accuracy of Information | \_\_/5 |  |
| Quality of Presentation | \_\_/5 |  |
| Use of Visuals | \_\_/5 |  |

**Assessment Table for Group Presentations:**

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| Assessment Criteria | Points | Comments |
| Comprehensiveness of Findings | \_\_/5 |  |
| Clarity in Presentation of Data | \_\_/5 |  |
| Understanding of natural dyeing concepts | \_\_/5 |  |
| Ecological Interpretations and Insights | \_\_/5 |  |
| Teamwork and Collaboration | \_\_/5 |  |
| Use of Visual Aids in Presentation | \_\_/5 |  |