|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Activity plan | | | | |
| ACTIVITY PLAN | | | | |
|  | | | | |

|  |  |  |
| --- | --- | --- |
| **Theme** | **Subtopic** | **Activity Title** |
| 3. Creative and critical thinking in Eco STEAM education | 3.2. Design thinking for an eco-friendly solution | Sustainable furniture |

|  |
| --- |
| Introduction part (or activity overview) |
|  |

|  |  |
| --- | --- |
|  | |
| **Introduction part (or activity overview)** | During the manufacturing process of a piece of furniture, we must take into account the maximum respect for the environment and the lowest possible environmental impact: in this way we contribute significantly to the care of our planet. Whether a piece of furniture is sustainable or not depends on its life cycle, its duration and the subsequent management of its waste, as well as the materials it is made of. The main difference between an ecological furniture and a conventional one is that during the manufacture of the ecological furniture the circular economy model is taken into account. The circular economy is based on the use of resources, trying to reduce the use of raw materials as much as possible, as well as the generation of waste. Therefore, the aim is to reuse and recycle the materials of a piece of furniture as much as possible and that, at the end of its useful life, the materials can continue to be used for the manufacture of other furniture. |
| **SETTING** | Classroom with computers, mechanical tools and equipment for making the tables and the chairs. |

|  |
| --- |
| Materials Needed |
|  |

|  |  |
| --- | --- |
|  | |
| **Materials Needed** | - Computer (phone or tablet can be used to collect information), projector (to present works), old tires and recycling materials which can be reused, tools, paint and laurel. |

|  |
| --- |
|  |
|  |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Learning Outcomes** | What is expected from the activities is:   * Students gain a deeper understanding of different eco-friendly materials; * Students develop critical thinking and working skills; * Students learn to search, investigate and calculate for the amount of materials needed for this project; * Students develop creativity; * Students acquire interdisciplinary knowledge; * Students increase the ecological awаrenes; * An incentive for a new business idea with sustainable furniture; * Students will gain a sense of sustainability in the community; |  |
| **Activity Contents** | **Activity: Sustainable furniture**  **Theoretical Part** **(Duration: 20 minutes)**:  Introduction discussion: What is sustainable furniture? What type of furniture is most sustainable? How to make sustainable furniture? How do you know if furniture is sustainable?  Information about the principles for sustainable furniture on the link:  <https://www.satinandslateinteriors.com/4-key-principles-of-sustainable-furniture-and-interior-design/>  **Task 1 (Duration: 30 minutes)** Research on eco-friendly materials for tables and chairs  Schoolchildren, working in groups, will have to make sustainable furniture for the hall of the school or the school yard. (If the furniture is made for the school’s yard the students will have to take in account all the weather condition through the year):   * Each group must examine one type of materials used for the furniture (e.g. wood, vegetable fibers, animal fibers, natural fabrics etc.). * Each student in the group has an assigned role (e.g., group leader and supervisor, data collector, data analyst, environmental impact predictor, speaker and presenter, everyone works on the product etc.).   For the choice of eco-friendly materials  <https://paudesign.com/en/eco-friendly-materials-for-furniture/>  <https://ecobnb.com/blog/2023/11/eco-sustainable-materials-furniture/>  **Task 2 (Duration: 60 minutes)** Design of the furniture using old tires  - Students start developing their designs, focusing on important elements for the furniture, layout, and aesthetic considerations and its stability.  For software design:  <https://www.smartdraw.com/>  <https://www.coreldraw.com/>  <https://www.adobe.com/products/photoshop>  **Task 3. Presentation, discussion, creation of the furniture and cleanup (60 minutes):**  - Students prepare their final presentations, using visual aids such as sketches, diagrams, or models  to illustrate their design of comfortable chair and table.  - Students explain their sustainable concepts and designing techniques.  Afterwards, they give their own reflection. Then, they host a discussion session for students to  provide feedback and ask questions about each other's designs, the effectiveness of different  sustainability strategies and the overall impact of eco-friendly design.  - Students clean up their workspaces and to store the materials for the next production.  **Additional Tips**  Questions that will help students with their research:   1. Evaluate the area of the tables and the chairs, and the field necessary for their placement. 2. Calculate the cost for paint and laurel. 3. Analyze the impact on the environment. 4. Evaluate the design and components of the system. 5. Conclusion about the final product and determining the risks of the work.   6. Prepare presentations (poster) and present them to classmates. |  |
| **Assessments** | The teacher evaluates the students' work and achievements through:  - Verbal feedback during class;  - Conversation with/among students;  - Monitoring of students during individual and group work;  - Observation the individual contribution of each student when working in groups;  - Evaluation of students' presentations;  - Highlighting the most elegant and ideal solution;  Each student independently evaluates his contribution to the work.  The final score is evaluated with a grade. It is possible to involve all students in the class in the assessment. After the presentations, students can make competition about best made furniture with online voting and questionnaires. |  |
| **Key Competences** | * Cognitive competence * Cultural competence |  |
| **Connections with Eco STEAM** | **Eco** - The choice of environmentally friendly and sustainable materials for furniture.  **S**cience: Knowledge of physics, chemistry and environmental sciences.  **T**echnology: Through innovation, creativity and change, to ensure the safety, comfort, health and safety of the students by using this furniture.  **E**ngineering: Students will learn to design their own model of an Eco-sustainable house.  **A**rt: Visually interesting and comfortable furniture for everyone.  **M**ath: Calculation of the amount of materials, assessment of cost-effectiveness, mathematical models and formulas about area. |  |
| **References** | Bumgardner S. M., Nicholls L. D. 2020. 11(12), 1277 Sustainable practices in furniture design: A literature study on customization, biomimicry, competitiveness, and product communication. |  |
| **Notes** | It is very important to leave this activity to the student’s imagination and creativity.  Also, regarding the materials used in the activity, it is left up to the students.  Cultural differences and specifications in different European countries can only lead to different products to this activity. |  |

**Assessment Table for Web Quest Reports:**

|  |  |  |
| --- | --- | --- |
| Assessment Criteria | Points | Comments |
| Depth of Research | \_\_/5 |  |
| Understanding of Eco-stainable materials role | \_\_/5 |  |
| Accuracy of Information | \_\_/5 |  |
| Quality of Presentation | \_\_/5 |  |
| Use of Visuals | \_\_/5 |  |

**Assessment Table for Group Presentations:**

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