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| Activity plan | | | | |
| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| 2. STEAM integration in environmental Education | 2.3 Engineering for Sustainable Infrastructure | From paper to blinds |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This activity is aimed to use paper in a rational way to create blinds or curtains of mathematical shapes strung on string with proposing practical solutions. In this way, paper pollution in the environment will be reduced and it will play significant role in arranging one’s staying or living place and it will also develop students’ awareness in respecting and meeting some important sustainability goals. |
| **SETTING** | Classroom |

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| Materials Needed |
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| **Materials Needed** | * Computer (phone or tablet can be used to watch the videos, to do some calculations), projector (to present works or videos to students), paper, pencils, scissors, ropes or stitches, egg’s white, sugar, salt, water, flour, pan for heating, bottle to collect the homemade glue. |

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| **Learning Outcomes** | * Decorate the windows or walls of the classrooms in a unique way. * Learn about the different shapes that a blind can be made into. * Measure, make calculations to create grids of 2-D shapes or 3-D solids, and at the same time learn about the area and volume of the shapes themselves. * Develop a greater awareness of the need to reuse paper before recycling it. * Notices an opportunity from this idea for business realization. |  |
| **Activity Contents** | **Activity: From paper to blinds**  **Theoretical Part** **(Duration: 30 minutes)**: Exchange opinions about the large quantity of paper that is not used in practical purposes. How can paper and cardboard be used to explain a grid of some geometric figures and solids? Clarify the net of cubes, prisms, pyramids, cylinders and cones. Analyze how these nets are made of some materials. Present how paper can be used for unique design for the blinds or wall decorations. Discuss the techniques used for the creation of the blinds.  **Task 1 (Duration: 20 minutes)** Students make research about production of glue with natural ingredients mentioned in the section Materials Needed or by using tree resin, if students can collect in the nature. In this first phase, the students should also investigate how they can reuse paper, taking into account which type of paper can be used for the appropriate purpose, while not disrupting the further processes for recycling that product. (Don't use lots of plastic or paint)  Short videos about the process of making glue:  [How To Make Glue With Egg White? Glue With Egg White Experiment | Easy Science Experiments For Kids - YouTube](https://www.youtube.com/watch?v=hzlLDgxQwp8) (Duration: 1:35)  [How to make homemade glue | homemade favicol |super Strong white glue at home - YouTube](https://www.youtube.com/watch?v=ASmdXuGAqmg)  (Duration: from 0:47 till 4:30)  Overview: Explanation of the process of preparing glue for our paper blinds.  **Task 2 (Duration: 60 minutes)**  Schoolchildren, working in small groups or even pairs, make the paper blinds.  Students decide about the types of solids made of paper for the wall decorations, the color they will use for painting the blinds after they are created. Also, students decide on the price of this original homemade product.  Videos for creation of the blinds:  <https://www.youtube.com/watch?v=GeE-SIP0yPE> (Duration: 9:35)  <https://www.youtube.com/watch?v=2g9vCfrn4MA> (Duration: 8:29)  Overview: In these videos you will find out about the techniques for creating the blinds from paper. Students can get the idea and make it more creative.  <https://www.youtube.com/watch?v=_95S6j3WUOo> (Duration: 10:29)  <https://www.youtube.com/watch?v=u_gn4S-0mhA> (Duration: 7:54)  Overview: These videos demonstrate the ways of creating wall or window decorations from paper. |  |
| **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' work and creation of the blinds   The final score is evaluated with a grade. It is possible to involve all students in the class in the assessment. Each student self-assesses his contribution to the work. |  |
| **Key Competences** | * Cognitive competence * Creativity competence |  |
| **Connections with Eco STEAM** | **Eco:** Ecological awareness about the need of reusing the paper before recycling it.  **S**cience: Knowledge of chemistry for making the glue.  **T**echnology: The use of applications for creating the design of blinds.  **E**ngineering: Through creativity the students have to create blind mechanism.  **A**rt: From a bird’s eye view or oblique perspective, the planted area should be interesting and beautiful for the human eye.  **M**ath: Mathematical models of solid and 2-D figures. |  |
| **References** | •Academic and scientific literature on botany, types of soil and care for the flowers.  •Literature for the bilogical processes through the implemented activities. |  |
| **Notes** | •The activity should be adaptable to different local ecosystems and weather conditions.  • Encouraging students to think about their future role in designing and shaping the space in which they live and work. |  |

**Assessment Table for Web Quest Reports:**

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| Assessment Criteria | Points | Comments |
| Creativity for the design | \_\_/5 |  |
| Strategy for the creation of the blinds | \_\_/5 |  |
| Use of types of paper | \_\_/5 |  |
| Understanding Math models | \_\_/5 |  |