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| Activity plan | | | | |
| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| 4. Collaboration and Communication in EcoSTEAM Projects | 4.4. Community Engagement and Partnerships | Students as initiators of afforestation of the environment |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | The purpose of this activity is for the students to launch an initiative for afforestation of the environment in which they live and realize it with the help of the local community. The students will receive information from the local community about which places in the environment need afforestation, and applying their knowledge and skills in mathematics and science, they will decide which trees are most suitable for planting, in what quantity and at what distance. Based on the student project, the local community will provide the necessary seedlings and tools and the transportation of the students to the necessary places. These activities will help students see the importance of trees in the ecosystem, develop critical thinking, make independent decisions and feel useful to society through their work. |
| **SETTING** | Classroom |

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| Materials Needed |
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| **Materials Needed** | Computers , video presentation equipment, paper, markers, tree saplings , shovels, trowels, and gardening gloves, watering cans or access to water, measuring tapes or rulers, notebooks and pencils. |

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| **Learning Outcomes** | * Understanding the importance of trees in the ecosystem. * learning the process and techniques of planting and caring for trees. * Applying STEAM concepts to design a tree planting project. * Creating artistic representations related to trees and the environment. * Defining afforestation and deforestation. * Application of mathematical reasoning in afforestation planning. * Developing a critical opinion, independent decision-making and developing a sense of responsibility towards society. |  |
| **Activity Contents** | **ACTIVITY 1 (50 min) : Afforestation vs Deforestation**  ***Theoretical part 1*** *(10min)*  Through questions the teacher initiates the students' prior knowledge of the importance of trees in the ecosystem and leads the students to highlight and explain the role of trees in maintaining a healthy environment such as: oxygen production, carbon sequestration, improving air quality, preventing soil erosion, regulating the water cycle, support of biological diversity, economic benefits, aesthetic and psychological benefits, noise reduction, etc. The teacher writes down the key words on a flip chart.  Then students watch a video about how the extreme values ​​of functions can be calculated using derivatives.  Video: **“Why planting trees is important ?”**  <https://www.youtube.com/watch?v=c3GerbZMRWA> (duration: 3 min)  Overview: An educational video designet to explain 7 reasons to protect forests and grow many more.  ***Theoretical part 2*** *(10min)*   * The teacher explains to the students that afforestation is planting trees where forests never existed before. There are many benefits to this, such as creating jobs, increasing biodiversity and sequestering carbon dioxide from the atmosphere. There are three main mechanisms to do this - such as natural regeneration, silviculture and agroforestry. Students watch an educational video about reforestation:   Video: **“What is afforestation ?”**  <https://www.youtube.com/watch?v=amtXcNe_Scc> (duration: 3 min 15sec)   * The teacher then explains that, in contrast to afforestation, deforestation is the clearing of large areas of trees by cutting down trees. Our planet's forests are some of the most valuable resources we have. They provide us with clean air, a source of food, building material and much more. More importantly, forests are the main line of defense against climate change, but despite this, forests are being systematically eliminated around the world - a process we know as deforestation. Students will see more about deforestation and how to limit the negative effects of cutting down trees in the following educational video.   Video: **“What is deforestation ?”**  <https://www.youtube.com/watch?v=vJnnrpSDWPI> (duration: 2 min 50sec)  *Task 1 (30 min)*  The teacher divides the students into groups of 4-5 students. Each group receives Venn Diagram Worksheet Compare and Contrast Afforestation and Deforestation (**Appendix 1**). The groups should research, discuss and complete the diagrams together. Finally, each group presents its findings to the class.  **ACTIVITY 2 (80 min) : Planning the tree planting project**  ***Theoretical part 1*** *(10min)*   * The importance of trees cannot be overstated. Trees help clean the air we breathe, filter the water we drink, ensure a healthy environment and provide habitat for over 80% of the world's terrestrial biodiversity. Despite this, we are witnessing constant destruction of forests by humans or by natural disasters. But all is not lost, there is a way to reduce deforestation by implementing sensible approaches to energy, land use and agriculture. Beyond that, reforestation is vital to counteract the deforestation that has occurred historically. Only by planting native trees can we restore our damaged landscapes to lush and healthy forests. * Planting trees is not a simple process and requires good preparation and skill. Before planting trees, it's important to be well prepared and know a few key factors to ensure the trees grow healthy and thrive. One should first select a suitable area, then know the climatic conditions in the afforestation area, the type of soil and the appropriate type of wood. Planting the wrong trees in the wrong place can do more harm than good. The following video highlights the importance of choosing the right location and type of tree for afforestation.   Video: **“When tree planting goes wrong ”**  <https://www.youtube.com/watch?v=m3wXop8GKoc> (duration: 3min 37 sec)  *Task 1 (20 min)*  Students are tasked with researching their surroundings to choose the most suitable site for afforestation (they should take into account distance from the city, accessibility to the site, soil type, water accessibility, etc.) and the type of trees. They can use Google Maps or other mapping tools to identify suitable locations. Students work individually and then as a class choose one site to plant trees.  *Task 2 (40min)*  After choosing the location and the type of trees, the students are divided into 4 groups and each group receives a task:   1. The first group calculates the area they want to reforest (they use mapping applications), the number of seedlings and the distance between them. 2. The second group calculates the distance and cost of transporting seedlings and equipment from the city to the afforestation site and the cost of transporting the people who will work on the afforestation. 3. The third group aims to check local regulations and contact (e-mail) the local community and local environmental societies to ask for cooperation. In the letter of support he should present the idea of ​​afforestation, the chosen location and ask the community to provide seedlings, necessary tools and machinery, transport and support of professionals. 4. The fourth group is tasked with designing what the forested area will look like after the trees have grown and through creative artwork to represent the importance of trees and the environment. This can be drawing, painting or digital art. They can also creating posters, videos or social media campaigns to promote afforestation.   At the end, each group should present their work to the class and jointly evaluate and approve the work or correct it if necessary.  With this, they complete their reforestation project plan and are ready to present it to the experts from the local community and the local environmental societies they will contact.  *Theoretical part 2 (5min)*  In order to be ready to implement their afforestation project, the students watch a video on how to plant a tree:  Video: **“How to plant a tree ? ”**  <https://www.youtube.com/watch?v=0VVeeWT3AAc> (duration: 2min 11 sec)  *Discussion and reflection (5 min.)*  • Students review the definition of afforestation and deforestation.  • The importance of trees in the ecosystem is emphasized.  • Students highlight the importance of choosing a suitable location for afforestation and the type of tree.  • Students highlight the steps in project planning and cooperation with the local community. |  |
| **Assessments** | Verbal feedback during class;  Conversation with/among students;  Monitoring of students during group work;  Evaluation of the thoroughness and accuracy of individual work;  Each student self-assesses his contribution to the work. |  |
| **Key Competences** | * Cognitive competence * Creativity competence * Communication competence * Social, emotional and healthy living competences * Digital competence |  |
| **Connections with Eco STEAM** | **Eco**- Exploring the need for afforestation encourages students to engage with their environment, understand the interconnectedness of ecosystems, and apply interdisciplinary skills to real-world problems.  **S**cience: Students will research local tree species and their benefits, soil types in their environment, and climate conditions.  **T**echnology: Students will use GPS and mapping software to plan planting sites.  **E**ngineering: Students will design tools or methods for efficient tree planting and irrigation.  **A**rt: Students will use their artistic abilities in creating and designing afforestation projects, creating posters, videos or social media campaigns to promote afforestation.  **M**ath: Students will calculate the area of ​​a site for afforestation, the number of trees needed, transportation costs, etc. |  |
| **References** | * Websites about afforestation and tree planting techniques (e.g. One Tree Planted) * Local forestry or environmental organizations * videos with a link given above in the text |  |
| **Notes** | • Students can monitor the growth of planted trees over time and keep a growth log.  • Encourage students to explore careers related to forestry, environmental science and ecology.  • Organize a community event with the department to promote tree planting and environmental awareness.  • Through these activities, students develop problem-solving skills and critical thinking abilities. |  |
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| Appendix 1 . STUDENT'S group workSHEET |
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| Explore the applet and answer the following questions:  Group name (you can choose a name with eco content ) |
| In the given Venn diagram, one example is given for each of the characteristics of afforestation, deforestation and common, you should go ahead and add at least 5 more characteristics for each section. Explore, discuss and complete the diagrams together. You can use the internet for research. |
| 1.png |
| After completing the diagram, choose one representative to present the work to the class |

**Assessment Table for individual work:**

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| Assessment Criteria | Points | Comments |
| Understanding afforestation and deforestation | \_\_/5 |  |
| Participating in discussions and activities | \_\_/5 |  |
| Digital skills at work with mapping tools and GPS | \_\_/5 |  |
| Ability to listen and evaluate the work of classmates | \_\_/5 |  |
| Accuracy in mathematical calculations | \_\_/5 |  |
| Solving a problem and making a conclusion | \_\_/5 |  |

**Assessment Table for group work:**

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| Assessment Criteria | Points | Comments |
| Understanding the objectives of the project and the concept of afforestation | \_\_/5 |  |
| Completing worksheets on time | \_\_/5 |  |
| Skills of presenting the work | \_\_/5 |  |
| Ecological Interpretations and Insights | \_\_/5 |  |
| Teamwork and Collaboration | \_\_/5 |  |
| Skill and creativity in project design | \_\_/5 |  |