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| Activity plan | | | | |
| ACTIVITY PLAN | | | | |
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| **Theme** | **Subtopic** | **Activity Title** |
| 3. Creative and critical thinking in Eco STEAM education | 3.4. Evaluating and Analyzing Environmental Information | Water consumption line regression |

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| Introduction part (or activity overview) |
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| **Introduction part (or activity overview)** | This activity aims to raise awareness among students about the amount of water used in each household, or generally in society wherever there is water distribution and consumption. There are significant differences between individual and industrial usage, and there is a direct link between population growth and demand for water supply. Line regression helps to make analysis, students calculate the percentage of water consumption by creating tables and graphs. |
| **SETTING** | Classroom complemented by digital research. |

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| Materials Needed |
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| **Materials Needed** | - Paper but even better on the computer/laptop (pen tablet)  - Pencil, pen, calculator  - Data on household water usage (e.g., from water bills or simulated data)  - Measuring tools (e.g., flow meters, buckets, stopwatches)  - Reference materials and math formulas for calculating  - Information about water consumption (weekly or monthly)  - Projector or screen (when presenting the results of the activity) |

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| **Learning Outcomes** | * Developing deep understanding about the impact of individual action on the environment; * Improving proficiency in expressing findings about a certain linear trending through a drawing; * Enhancing skills in digital research and data statistical analysis. * Improving ability to critically analyze and discuss about the disadvantages of water pollution and advantages for water saving and consumption and its impact on the quality of life. |
| **Activity Contents** | **Activity: Water consumption line regression** (Duration: Approximately 2,5 hours)  **Theoretical part:** (Duration:15 minutes)  Students debate on climate change related risks such as: urban heat waves, melting glaciers, longer droughts, drying reservoirs, and increased frequency of floods and droughts. Student become more aware for the water demand initiated by the water consumption. Students discuss how water conservation impacts the environment and society, common methods of water conservation and why they are important.  Short video about population growth and water demanding equations:  <https://www.youtube.com/watch?v=gbaCBPxnBtA> (Duration: 7:48)  Short video about water demand calculation in given example:  <https://www.youtube.com/watch?v=diHzFmtl4dM> (Duration: 11:15)  Short math literacy video about how to calculate water tariff:  <https://www.youtube.com/watch?v=hYCYdq33yBE> (Duration: 6:15)  **Task 1. Concept of linear regression (15 minutes):**  - Discuss the concept of linear regression and its importance in explaining some phenomena in the daily life and represent scientific information, explore ways and formulas to represent a regression line model for water consumption.  **Task 2. Creating the water consumption line regression (30 minutes):**  - Students start working on their task, they calculate the total water usage, analyze and compare data: use the collected data to compare the water usage of different methods for the same activity (For example, compare the water usage of hand-washing dishes versus using a dishwasher.) Create graphs to visualize the data (e.g., bar graphs, pie charts etc.)  - Students collaborate and exchange ideas with their peers, providing feedback and support to one another. They discuss and share their progress, challenges, and successes.  - Students prepare their findings for presentation.  **Task 3. Presentation, reflection and social network encouragement (60 minutes):**  - Students present their line of regressions to the class, explain their conclusions and tips for saving water, and at the same time they show their digital skills inf front of other students.  - They reflect on how water saving contribute to environmental sustainability. Students discuss about the benefits of water saving and rational water consumption, the challenges encountered, and the lessons learned through the process.  - Students share their research and art models online on the social media. |
| **аAssessments** | * Assessment of Web Quest reports for depth of research and understanding. * Personal presentations synthesizing the benefits of upcycling, the challenges encountered, and the lessons learned through the creative process. * Reflection on how precisely the students made the line of regression and what conclusions are drawn from that analysis. |
| **Key Competences** | * Cognitive competence * Cultural competence * Creativity competence |
| **Connections with Eco STEAM** | **Eco** – Save water  **S**cience – additional research of water consumption in agriculture, industry etc.  **T**echnology - use of digital tools for research, MS Excel, R and GeoGebra for visual representation of the line of regression.  **E**ngineering – an attempt to create a mechanism that leads to minimal water consumption.  **A**rts – possibility of art sketch about the water consumtion and waste of water every day, pop art exibition with messages that stimulate quality of water saving, put digital posters and brochures on the social media to promote water-saving practices.  **M**ath - data statistical analysis of amounts of water consuption, proportions, tables, graphs and functions. |
| **References** | • Academic and scientific literature about math formulas used for the calculations.  • Online databases and resources for line of regression and models for water demanding equations. |
| **Notes** | • The activity should be adaptable to students who listen advantage level of mathematical statistics. |

**Assessment Table for Web Quest Reports:**

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| Assessment Criteria | Points | Comments |
| Depth of Research | \_\_/5 |  |
| Understanding the concept: Line regression | \_\_/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 ICT tools for statistical data research | \_\_/5 |  |
| Ecological Interpretations and Insights | \_\_/5 |  |
| Teamwork and Collaboration | \_\_/5 |  |
| Use of Visual Aids in Presentation | \_\_/5 |  |