|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| ACTIVITY PLAN | | | | |
| ACTIVITY PLAN | | | | |
|  | | | | |

|  |  |  |
| --- | --- | --- |
| **Theme** | **Subtopic** | **Activity Title** |
| Global and Local Perspectives in Environmental Education | Local Environmental Challenges and Solutions | Pollution in the Gymnasium Environment and Ways to Reduce It. |

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

|  |  |
| --- | --- |
|  | |
| **Introduction part (or activity overview)** | Students, using the needle method, will assess the air quality of the gymnasium's environment and plan a school community-inclusive event "Car-Free Day," which will encourage the use of environmentally friendly modes of transport and strengthen community ties. |
| **SETTING** | Class with an interactive whiteboard. |

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

|  |  |
| --- | --- |
|  | |
| **Materials Needed** | Fir or pine branches that have grown under different air pollution conditions, tips of the lower branches, hot water, scales, scissors, knife, glasses, electric stove, luxmeter, glass rods, petri dishes, filter paper, flasks, phones, computers. |

|  |
| --- |
|  |
|  |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Learning Outcomes** | * Enhance research skills. * Encourage sustainable lifestyles and environmental awareness. * To reinforce the awareness that everyone can contribute to environmental sustainability. * Develop teamwork and environmental event organisation skills. |  |
| **Activity Contents** | **Activity 1: Determining air pollution in the school environment.**  **Theoretical part (Duration: 15 minutes):** Students are introduced to air quality bioindicators. Students are shown pictures of bio-indicators and use the internet to find their names.  They are introduced to the methodology.  The leaves of conifers are covered by a thick cuticle which reduces transpiration and protects them from damage and air pollution. Air pollution increases the amount of wax in the needles, so the amount of wax can be used to measure air pollution.  A few tips of the lower branches of spruce (pine) trees growing in areas with varying levels of pollution are removed. The thorns are carefully removed. Weigh 50 g of the needles and place them in individual beakers. Pour 100 ml of boiling water over each. Stir with a glass rod and keep for 15-20 minutes, stirring occasionally. The water is then filtered into separate flasks for each sample. Visually compare the amount of dust and soot remaining on the filter. Photograph the filters. The filters are cooled and the turbidity is determined using a lux meter. Record the lux meter reading [lx]. In the absence of a luxmeter, determine visually the degree of turbidity (0, 1, 2, 3, 4, 5) in comparison with distilled water.  **Task (Duration: 90 minutes):**  Step 1: Working in groups. Each group chooses the same type of coniferous tree (spruce or pine). Each group should have chosen one study site in advance (forest, high pollution area, gymnasium environment) and brought some conifer branches. The results of the test (filter paper after titration and filter) are photographed and the photometer readings are recorded.  Step 2: The results of the study are presented to the class. Each group writes their data in a common table (Annex 1).  Step 3: A graph is drawn. Draw a conclusion about the air quality of the gymnasium environment.  **Activity 2: Planning the "Car-Free Day" event**  **Theoretical part (Duration: 20 minutes):** Watching and discussing a film on the environmental impact of transport by answering the questions: what pollutants do vehicles emit? What are the health effects of pollutants? Students are given information about the European Air Quality Index and where to find real-time information about the air quality in their city [http://airindex.eea.europa.eu/#\_blank]. By visiting the European Environment Agency website, pupils can check the real-time air quality index for their area.  Duration: Approx. 1:53 minutes  <https://www.youtube.com/watch?v=bpFu85IMVhM>  Discussions on ways to reduce air pollution from transport.  **Task (Duration: 60 minutes):**  Step 1: Mind map. Students come up with ideas for a Car Free Day, a discussion takes place and the best ideas are selected.  Step 2: Setting up working groups. Teacher gives a list of working groups: advertising professionals, cameramen, extras, public event organisers. Students can suggest other working groups. The groups are divided according to their interests and skills, the groups choose a coordinator and each group is given a specific task.  Step 3: Planning group activities. Groups use IT tools to develop an action plan with tasks and deadlines.  Step 4: Presentation of the groups' plans. Groups present the plans they have developed. The other groups make suggestions on how to improve the group's activities.  Step 5: Ideas for the campaign poster are proposed and a general sketch is developed. |  |
| **Assessments** | The research paper is scored (Annex 2).  The evaluation of the "Car-Free Day" event is carried out at the end of the campaign (Annex 3). |  |
| **Key Competences** | * Cognitive competence * Creativity competence * Communication competence * Social, emotional and healthy living competences * Digital competence |  |
| **Connections with Eco STEAM** | Eco – gained knowledge about air pollution and ways how to reduce it  Science – detect air pollution using bioindicators  Technology – creative use of information technology  Engineering – use of the luxmeter  Art – develop skills in the art of visualisation  Math – graphical presentation of survey data |  |
| **References** | * Elena Šapokienė. Aplinkotyra. Vilnius, 1994 * <http://airindex.eea.europa.eu/#_blank> |  |
| **Notes** | Ideas for a car-free day: walking or cycling tour; lectures by environmentalists; presentations on sustainable transport; collecting and summarising statistics on pupils' modes of arrival (regular and on the day of the campaign); handing out information leaflets to drivers in car parks. |  |
|  |  |  |

|  |
| --- |
|  |

Annex 1

**TABLE OF SURVEY DATA. INFLUENCE OF ATMOSPHERIC POLLUTION ON THE WAX CONTENT OF NEEDLES**

|  |  |
| --- | --- |
| Plant habitat | Illuminance (lx) or degree of opacity |
| Forest |  |
| School environment |  |
| X1 environment |  |
| X2 environment |  |

Annex 2

**Activity 1 Self-Assessment Table**

|  |  |  |
| --- | --- | --- |
| Evaluation criteria | Points | Comments |
| Readiness for work | \_\_/5 |  |
| Carrying out the work in accordance with the methodology | \_\_/5 |  |
| Independence | \_\_/5 |  |
| Presentation of results, conclusion | \_\_/5 |  |

Annex 3

**Activity 2 Self-Assessment Table**

|  |  |  |
| --- | --- | --- |
| Evaluation criteria | Points | Comments |
| Effectiveness of planning | \_\_/5 |  |
| Ability to act according to the plan | \_\_/5 |  |
| Creativity | \_\_/5 |  |
| Collaboration | \_\_/5 |  |
| Effort | \_\_/5 |  |
| What worked |  | |
| What needs to be improved |  | |