CONTENT

5 TOPIC. GLOBAL AND LOCAL PERSPECTIVES IN ENVIRONMENTAL EDUCATION

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5.1. SUBTOPIC. GLOBAL ENVIRONMENTAL ISSUES

5.1.1. ACTIVITY PLAN: GLOBAL WARMING AND CLIMATE CHANGE	
Introduction part (or activity overview)	The main greenhouse gases that cause climate change include carbon dioxide and methane. This activity is designed to produce carbon dioxide and compare the heat retention of air with that of CO2. Working in groups, students will create a model of the greenhouse effect, examination of the negative impact of the greenhouse gas carbon dioxide on temperature and the living environment, experiencing disruption of the ozone layer that protects the earth's mantle from global warming.
Setting	Chemical cabinet or classroom
Materials Needed	Two identical transparent containers (glass jars, plastic bottles, containers or Erlenmeyer's), thermometer, light source (lamp or sunlight), CO2 source (vinegar and baking soda reaction), stopwatch or timer, balloon or tubes, computer.
Learning Outcomes	• Explain the role of greenhouse gases in the Earth's atmosphere and their contribution to climate change. • Evaluate different perspectives on climate change, considering scientific evidence, socio-economic factors.Develop skills in environmental advocacy and communication to promote awareness and action on global warming issues. • Demonstrate the ability to interpret and communicate scientific data related to climate change through graphs, charts and scientific literature. • Apply knowledge of climate change science to propose and evaluate potential solutions at local, national, and global levels. • Design and implement strategies to reduce greenhouse gasses
Activity Contents	**Activity 1: Greenhouse gasses research and description of the greenhouse effect** **Theoretical Part (Duration: 25 minutes)**: Students use Phet application to simulate greenhouse effect with waves, photons, layer model. They examine in an interesting way the influence of temperature on the formation of waves, energy balance of atmosphere, flux meter sunlight and infrared during the formation of photons, greenhouse gases concentration during the formation of layer model. https://phet.colorado.edu/sims/html/greenhouse-effect/latest/greenhouse-effect_all.html?locale=mk While watching the simulations of greenhouse effect, students describe the effect of greenhouse gases and clouds on sunlight, infrared radiation and surface temperature. They explain why greenhouse gases affect the temperature. Students compare and contrast the behavior of sunlight and infrared radiation. They also describe radiation balance and use it to explain the relationship between the surface temperature and greenhouse gas concentration. Students compare the effect of greenhouse gases to the effect of infrared absorbing layers. **Video:** https://www.youtube.com/watch?v=f2qAd1sEsBA https://www.youtube.com/watch?v=LvdV61Q6otI **Activity 2: Design and create a model of the greenhouse effect.** **Duration: 90 minutes** **Step 1:** Students divide into groups. The groups design and create a model of the greenhouse effect.

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	Step 2: Demonstrate an experiment to determine the impact of carbon dioxide on air temperature. A control test is performed using a jar, plastic bottle or erlenmeyer that is not filled with carbon dioxide gas, and an experimental test is done with carbon dioxide. Temperature changes are recorded every 5 to 30 minutes, measure and record the initial temperatures of both containers using the thermometer. **Step 3:** Mix vinegar and baking soda to produce carbon dioxide CO2 A chemical reaction occurs that can be represented by the chemical equation : $CH3COOH + NaHCO3 \rightarrow CH3COONa + H2O + CO2$ The reaction is endothermic which makes the amount of heat captured by the CO2 more impressive. **Task 1:** What does the volume of CO2 gas that will produce if you add 0,6 g baking soda to vinegar? **Step 4:** Simulate solar radiation with an infrared lamp. **Step 5:** Repeat the experiment under the sunlight. **Step 6**: Compare the heat retention of air with that of CO2, analyze and compare temperature between the container with CO2 and the one with regular air. **Step 7**: Present the obtained results and discuss with a class. **Task 2:** Graphically present a diagram of the dependence of concentration of carbon dioxide to a temperature.
Assessments	After completing the work, students perform self-assessment (Appendix 1). Group work is graded (Appendix 2).
Key Competences	• Cognitive competence • Creativity competence • Communication competence • Social, emotional and healthy living competences • Citizenship competence • Digital competence • Cultural competence
Connections with Eco STEAM	Eco – The impact of human activities on climate change. Science – Connect knowledge of chemistry, physics, biology and math. Technology – Using digital technologies. Engineering – Design a model of the greenhouse effect. Math – Calculations for the volume of C02 and graphical representation of the obtained results.
References	https://phet.colorado.edu/sims/html/greenhouse-effect/latest/greenhouse-effect_all.html?locale=mk https://www.youtube.com/watch?v=f2qAd1sEsBA https://www.youtube.com/watch?v=LvdV61Q6otI

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Notes	Climate change refers to long-term changes in temperatures and weather patterns. Such shifts can be natural, due to changes in solar activity or large volcanic eruptions. But since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels such as coal, oil and gas, which generates emissions of greenhouse gases mainly carbon dioxide and methane, which trap the sun's heat and raise temperatures. The Earth's average surface temperature is now about 1.2 °C warmer than it was in the late 1800s (before the Industrial Revolution) and warmer than at any time in the last 100,000 years. The last decade (2011-2020) was the warmest on record, and each of the last four decades has been warmer than any previous decade since 1850. Many people think that climate change mainly means warmer temperatures. But the rise in temperature is only the beginning of the story. Because the Earth is a system, where everything is connected, changes in one area can affect changes in all others. The consequences of climate change now include, among others, intense droughts, water shortages,wildfires, rising sea levels, floods, melting polar ice, catastrophic storms and declining biodiversity Many solutions to climate change can bring economic benefits while improving our lives and protecting the environment. We also have global frameworks and agreements to guide progress, such as the Sustainable Development Goals. Switching energy systems from fossil fuels to renewable sources such as solar or wind will reduce the emissions that drive climate change. But we must act now. While a growing number of countries are committing to net zero emissions by 2050, emissions must be halved by 2030 to keep warming below 1.5°C. Achieving this means a huge drop in the use of coal, oil and gas: over two-thirds of today's proven fossil fuel reserves need to be kept in the country by 2050 to prevent catastrophic levels of climate change.

APPENDIX 1. SELF-ASSESSMENT SHEET

Self-Assessment	Answers and Interpretations
Specify the types of greenhouse gases emitted; Discuss factors that influence emissions; What are the primary activities or sources in your daily life that contribute to greenhouse gas emissions**?**	
Describe any actions taken to reduce emissions from each source; Consider the significance in terms of global warming potential and contribution to climate change; What actions have you taken to reduce your greenhouse gas emissions ?	
Relate the experiment's findings to real-world implications of increased CO2 levels in the atmosphere; In your opinion, who are the goals for reducing greenhouse gas emissions in the future?	
What skills did you improve? Did you cooperate and share informations, conclusions?	

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Did the experiment help you examine the impact of greenhouse gases on the global environment?	
Notes	

APPENDIX 2. EVALUATION SHEET

Evaluation Criteria	Points	Comments
Methodology and design of the experiment: Effective demonstration of greenhouse effect principles	_/10	
Identification of experimental design: Clear and detailed description of materials, procedures and the way of performing the experiment	_/10	
Accuracy of measurements and data: Calculations Greenhouse Effect Diagram Graphical Presentation of Results	_/15	
Analysis of the data and interpretation of the results in the context of the set hypotheses: Presentation The way of summarizing the key findings of the experiment	_/10	
Critical thinking and debate	_/5	

5.1.2. ACTIVITY PLAN: WE CREATE CLIMATE AND HEALTH-FRIENDLY DISHES	
Introduction part (or activity overview)	In this activity, we aim to introduce students to the principles of sustainable and healthy nutrition and encourage them to make personal lifestyle changes. Following sustainability principles, we will create recipes. By preparing dishes, students will learn how to distinguish environmentally and health-friendly food.
Setting	The classes will take place in the technology (nutrition) classroom.
Materials Needed	Smart devices (computer, phone), projector, notepad, pen, recipes, technological dish card, kitchen equipment and tools, food products.

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Learning Outcomes	• Improve digital skills by searching for information from various sources. • Acquire knowledge about sustainable cooking and be able to explain its environmentally friendly impact convincingly. • Foster healthy eating habits while emphasizing the aspects of sustainability within the food system. • Be able to assess dietary aspects within the context of food system sustainability, create recipes for sustainable eating, and prepare them.
Activity Contents	**Activity1: Creating Climate- and Health-Friendly Dishes.** **Theoretical Part (Duration: 20 min)** Introduction Discussion. Students are presented with questions: What is sustainability? Do you consider your diet sustainable? Healthy? How is food preparation related to climate change? When is World Food Day celebrated? Discussion on Sustainable Food Products. The five principles of sustainability for creating climate- friendly dishes are discussed: https://www.sustainable-public-meal.eu/lt/tools/climate-friendly-dish/ Students conduct the "Invisible Side of Food" test to reinforce the material. https://www.linkejimaimaistas.lt/testai/ https://www.linkejimaimaistas.lt/quizzes/ (10 min) After completing the test, students are encouraged to reflect on what each individual could and would like to do to change the situation and what they could do in the near future. **Task: (Duration: 25 min) Creation of a Climate- and Health-Friendly Dish Recipe.** Stage 1: In groups, students search for recipes. In the chosen dish recipe, 1-2 ingredients are replaced with those food products that align with the principles of sustainability and recommendations for healthy eating. A technological card for the climate- and health-friendly dish is created (see Attachment 1). Stage 2: Presentation of the created recipe: justify why this dish contributes to sustainability and health. **Task: (Duration: 90 min) Implementation of Project Ideas "Creating Climate- and Health-Friendly Dishes."** Working in groups, students sort waste, following technological and hygiene requirements, prepare the planned sustainable dishes, serve them, taste them, discuss technological processes, evaluate, and self- assess. Stage 1: Preparation for the lesson: preparation of workstations, clothing, hygiene requirements, necessary products, tools, recalling safety requirements. Stage 2: In groups, discuss the technological sequences of the dish and allocate tasks. Stage 3: Students carry out technological processes according to the created sustainable dish recipe, sort waste, and conserve water. They record work stages and the final result.

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	Stage 4: Serve the dishes, taste them, and treat other group members. Stage 5: Assess the quality of the prepared dishes according to the provided criteria for dish quality assessment (see Attachment 2). Stage 6: Calculate the nutritional value and cost of the dish. https://www.megaukismaistu.lt/2016/maistingumo-skaiciuokle ir (3 priedas). Reflection: Students record and summarize the quality of the dishes determined during the tasting, friends' observations, difficulties encountered, advantages and disadvantages of the work process, successes and failures, and their reasons.
Assessments	Practical work is assessed by grades according to the following criteria: student's preparation for the lesson (special work attire, products) - 1 point, technological processes (cooking, dish presentation) - 3 points, serving at the table (table setting) - 1 point, assessment of dish quality - 1 point, calculation of dish cost and nutritional value - 1 point, justification of how the dish contributes to sustainability and health - 1 point, safe behavior and communication culture - 1 point, organization of the workplace - 1 point.
Key Competences	• Creativity competence • Digital competence • Cognitive competence • Communication competence • Citizenship competence • Social, emotional and healthy living competences • Cultural competence
Connections with Eco STEAM	Eco – Students research how to choose eco-friendly ingredients that are both environmentally friendly and healthy. Science - Students draw upon knowledge from biology, chemistry, economics, and environmental sciences to investigate how to select sustainable and healthy ingredients for a dish. Technology - Students use technology for recipe research and to experiment with ingredients. Engineering - Students design dish recipes, taking into account ingredient interactions and flavor. They also innovate new methods to produce dishes more efficiently and sustainably. Art - Creative solutions that promote sustainable thinking and aesthetics. Students creatively design dish presentations, such as artistic photography or artistic presentations. Math - Mathematical calculations in food production, including determining ingredient proportions to ensure the dish is the correct size, and converting units of measurement (e.g., kilograms to grams or liters to milliliters) in calculating dish costs.
References	https://www.linkejimaimaistas.lt/patarimai/ https://www.vartotojai.lt/sincerelyfood/test/food/ https://www.sustainable-public-meal.eu/lt/tools/climate-friendly-dish/
Notes	-

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Annex 1. Example of a dish technological card.

Technological Card No. _____

Dish name:

Production norm: (number of portions)

No.	Component name	Unit of measure	Gross	Net	Output
	Output				

Technological description: Annex 2. Dish quality assessment.

Quality criteria:	Dish description
Aroma. Taste.	
Dish appearance (Color. Texture. Shape).	
Technical execution. Cooking method (baked, unbaked, burnt, risen, fallen, etc.) Cooking process - sequence of products, baking temperature and duration. Use of dish recipe or self-creation.	
Serving of the dish. Portion size on the plate. Dish decoration. Originality (in a classical way).	
Caloric content, nutritional value.	
Price and quality value.	
Eco-friendliness.	

Annex 3. Dish cost calculation.

Dish name:

The number of portions:

Cost per portion:

No.	Component name	Quantity (g)	Price per 1 kg (eur)	Price (eur)

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Time taken to prepare the dish: .....

What is your hourly wage (assuming you receive the minimum wage)? Currently, the minimum wage per hour in Lithuania
is…….....
.....

Your hourly wage:
.....

Your production costs:
.....

Calculate your dish's value-added tax (21% of production costs):
.....

Find the price of the same dish sold in a public catering company. What is its price?
.....

Compare the price of your dish and the public catering company's product
…….....
.....

5.1.3. ACTIVITY PLAN: EXPLORING GLOBAL ENVIRONMENTAL CHALLENGES	
Introduction part (or activity overview)	This activity aims to develop students' understanding of global environmental issues through research, analysis, and presentation. Students will explore significant global environmental challenges, analyze their causes and effects, and propose potential solutions.
Setting	Location: Classroom and computer lab for research and analysis. Educational Context: Collaborative group work (4-5 students per group).
Materials Needed	Computers with internet access and relevant software (e.g., presentation tools, data visualization tools) Access to online databases and resources on environmental issues Projector for presentations Poster boards and markers for visual aids
Learning Outcomes	• Understand the causes, effects, and potential solutions for global environmental issues.

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	• Develop skills in research, data analysis, and critical thinking. • Enhance abilities in project development and presentation.
Activity Contents	**Theoretical Part (Duration: 60 minutes)**: Begin with an introduction to the significance of understanding global environmental issues. Highlight various challenges and their global impacts. • **Introduction to Global Environmental Issues**: o Explain what global environmental issues are and why they are critical to understand. Discuss the interconnectedness of global ecosystems and the impact of human activities on the environment. o Provide an overview of major global environmental challenges, including climate change, deforestation, loss of biodiversity, ocean acidification, air pollution, and water scarcity. • **Causes and Effects of Global Environmental Issues**: o Discuss the causes of climate change, including greenhouse gas emissions from human activities. Explain the effects of climate change on weather patterns, sea levels, and ecosystems. o Examine the causes of deforestation, such as agriculture, logging, and urbanization. Discuss the effects on biodiversity, carbon sequestration, and local communities. o Explore the causes of biodiversity loss, including habitat destruction, pollution, and climate change. Discuss the ecological and economic impacts of losing species diversity. o Explain the causes of ocean acidification, primarily due to increased CO2 levels. Discuss its effects on marine life and ecosystems. o Discuss the sources of air pollution, including industrial activities and vehicle emissions. Explain the health and environmental impacts of air pollutants. o Examine the causes of water scarcity, such as overuse, pollution, and climate change. Discuss its effects on human populations and ecosystems. • **Case Studies**: o **Case Study 1: Climate Change Mitigation Efforts**: Present a case study on global efforts to mitigate climate change. Discuss international agreements, such as the Paris Agreement, and their impact. o **Case Study 2: Conservation of Rainforests**: Share a case study on efforts to conserve rainforests in the Amazon. Highlight the strategies used and the outcomes achieved. • **Video Resources**: o "Understanding Global Environmental Issues" https://www.youtube.com/watch?v=aTrWtFR_FrQ – A video showcasing major global environmental challenges and their impacts. o "Global Solutions for Environmental Problems" https://www.youtube.com/watch?v=-D_Np-3dVBQ – An overview of international efforts to address global environmental issues. **Discussion Prompts**: • How do global environmental issues affect local communities? • What are the key challenges in addressing global environmental problems? • How can individuals contribute to global environmental solutions?

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5.1.4. ACTIVITY PLAN: GLOBAL ENVIRONMENTAL SUMMIT SIMULATION	
Introduction part (or activity overview)	This activity simulates a global environmental summit where students represent different countries. They will research global environmental issues, prepare position statements, and engage in discussions and negotiations to develop a global action plan.
Setting	Location: Classroom or large meeting space for the summit simulation. Educational Context: Individual and group work, followed by a collaborative summit simulation.
Materials Needed	Research materials (books, articles, internet access) Country profile sheets Presentation tools (e.g., PowerPoint) Name tags and flags for country representation Whiteboard and markers
Learning Outcomes	• Develop understanding of global environmental issues and their impacts. • Enhance skills in research, negotiation, and diplomacy. • Improve abilities in critical thinking, problem-solving, and collaborative

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	decision-making.
Activity Contents	**Activity1** **Theoretical Part (Duration: 60 minutes)**: Begin with an introduction to major global environmental issues and the importance of international cooperation. ● **Introduction to Global Environmental Issues**: o Discuss major global environmental issues such as climate change, deforestation, ocean pollution, and biodiversity loss. o Explain the causes of these issues and their impacts on the environment and human societies. o Highlight the importance of international cooperation in addressing global environmental challenges. Discuss key agreements like the Paris Agreement and the role of organizations like the United Nations. **Discussion Prompts**: ● Why is international cooperation essential for addressing global environmental issues? ● What are the key challenges in achieving global consensus on environmental actions? ● How can countries balance economic development and environmental protection? **Task 1: Research and Preparation (Duration: 90 minutes) Objective**: To research global environmental issues and prepare country-specific position statements. **Steps**: 1. **Assign Countries**: Each student or group represents a different country. 2. **Research**: Use provided materials to research the assigned country's environmental policies, challenges, and priorities. 3. **Position Statement**: Prepare a position statement outlining the country's stance on major global environmental issues and proposed solutions. **Flow Chart**: Research Country's Environmental Issues --> Prepare Position Statement --> Develop Negotiation Strategy **Task 2: Summit Simulation (Duration: 120 minutes) Objective**: To engage in discussions and negotiations to develop a global action plan. **Steps**: 1. **Opening Statements**: Each country presents its position statement. 2. **Negotiations**: Engage in negotiations to find common ground and develop a global action plan. Use the whiteboard to track proposals and agreements. 3. **Final Agreement**: Draft and present the final global action plan, incorporating input from all countries. **Flow Chart**: Present Position Statements --> Engage in Negotiations --> Draft Global Action Plan --> Present Final Agreement
Assessments	Thoroughness of research and accuracy of position statements. Effectiveness in negotiations and collaboration. Quality and feasibility of the global action plan. Clarity and persuasiveness of presentations. Team dynamics and participation.
Key Competences	Research and analytical skills

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	Critical thinking and problem-solving Negotiation and diplomacy Effective communication and presentation skills Collaboration and teamwork
Connections with Eco STEAM	Eco: Understanding and addressing global environmental issues. Science: Applying scientific knowledge to develop solutions. Technology: Utilizing digital tools for research and presentations. Engineering: Proposing technological solutions for environmental challenges. Arts: Creatively presenting position statements and action plans. Math: Analyzing data to support arguments and proposals.
References	-
Notes	-

Evaluation Criteria Table for Global Environmental Summit Simulation

Evaluation Criteria	Points Available	Comments
1. Thoroughness of Research and Accuracy of Position Statements	20	Assess the depth and accuracy of the research conducted and the quality of the position statements prepared.
2. Effectiveness in Negotiations and Collaboration	20	Evaluate the students' ability to negotiate effectively, collaborate with others, and find common ground.
3. Quality and Feasibility of the Global Action Plan	20	Rate the practicality, comprehensiveness, and creativity of the final global action plan developed.
4. Clarity and Persuasiveness of Presentations	20	Assess the clarity, persuasiveness, and engagement level of the presentations given by each country.
5. Team Dynamics and Participation	20	Evaluate the level of teamwork, communication, and participation among group members throughout the activity.

Total Points: 100

5.2. SUBTOPIC. LOCAL ENVIRONMENTAL CHALLENGES AND SOLUTIONS

5.2.1. ACTIVITY PLAN: POLLUTION IN THE GYMNASIUM ENVIRONMENT AND WAYS TO REDUCE IT

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.

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Setting	Class with an interactive whiteboard.
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

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	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	

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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		

5.2.2. ACTIVITY PLAN: A SMALL OXYGEN FACTORY OF AQUATIC PLANTS	
Introduction part (or activity overview)	Students, with an interesting and entertaining experiment that lies on the borderline of two sciences – chemistry and biology, easily produce pure oxygen through the process of photosynthesis by aquatic plants, a small oxygen generator.
Setting	A chemical cabinet with appropriate equipment for conducting bio - chemical processes or a

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	classroom with the necessary equipment and materials Educational context: teamwork and learning.
Materials Needed	Solution of baking soda (5 g/L), water plant (in our case it is waterweed), beaker, funnel, test tube, match or splinter, lamp, phones, computer.
Learning Outcomes	• Encourage local environmental challenges and solutions. • Reinforce the awareness that everyone can contribute to environmental sustainability. • Develop teamwork and environmental conservation skills. • Enhance research skills for global and local perspectives in environmental education.
Activity Contents	**Activity 1: The meaning and role of oxygen and clean air for healthy living** **Theoretical part (Duration: 15 minutes):** Discussion on improving air quality by planting trees, numerous plants and green areas. Students research the process of photosynthesis online, discover the meaning of oxygen released during the process of photosynthesis. **Task (Duration: 60 minutes): Preparation for demonstration** Step 1: Working in groups. Each group to prepare laboratory equipment and reagents for experimentation. Step 2: Have each group state a hypothesis and expected results of the photosynthesis experiment. Step 3: Giving suggestions on how to make oxygen at home with the help of plants. **Activity 2: Photosynthesis and significance for the environment** **Theoretical part (Duration: 20 minutes):** Watching and discussing a video of a small oxygen factory – plants, description of the experiment and method of performance. Duration: Approx 1min 13sec https://www.youtube.com/watch?v=Uiuct-2yAxA Processes description: Photosynthesis is a complex chemical process in which light energy transforms into the energy of chemical bonds, or more simply it is a process in which carbon dioxide and water transform into organic substances and oxygen under the impact of light: $CO_2 + H_2O \rightarrow$ Organic substances + O_2 **Task 1 (Duration: 60 minutes): Demonstration of an experiment** Step 1: Take an aquatic plant, place the water plant in the beaker, cover it with a funnel and fill the beaker with the salt solution. Step 2: Submerge it in a solution of baking soda which serve as a source of carbon dioxide Step 3: Place a test tube filled with water into the funnel. (After 15 minutes under a bright light the plant will be covered with oxygen bubbles, they accumulate in the test tube, displacing the water) Step 4: Turn on a bright light and wait for around two to three hours. After the test tube fills completely, carefully remove it from the funnel and hold a smoldering splinter or match it up. Watch the splinter burn.

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	When exposed to light, photosynthesis takes place in the plant. During the process, carbon dioxide and water turn into organic compounds and oxygen. Two hours later the gas will fill the hole test tube. Step 4: Prove the presence of oxygen It is easy to prove the presence of oxygen – just lower a smoldering splinter or match into the test tube and it will immediately flare up, as oxygen is a gas that supports combustion. Why the solution of baking soda is required: as the carbon dioxide in the air dissolves poorly in water, to increase its concentration we can use carbonates or bicarbonates, which by their nature are salts of carbonic acid ($CO_2 \cdot H_2O$). **Task 2 (Duration: 30 minutes):** Final Work. Reflection. Students write equations for the photosynthesis process, draw the photosynthesis graph and make a poster. The overall reaction in which carbohydrates—represented by the general formula (CH2O) n—are formed during plant photosynthesis can be indicated by the following equation: light CO2 + H2O → (CH2O)6 + O2 + H2O green plants
Assessments	The reflection will be evaluated through the self-evaluation method. The evaluation segments are contained in the evaluation table, which includes: Proper handling of laboratory equipment and reagents, equations for the photosynthesis process, graph and poster, description of the process of photosynthesis and producing an oxygen, skills in presenting about Local Environmental Challenges and Solutions. All students in the class can be included in the evaluation.
Key Competences	• Cognitive competence • Creativity competence • Communication competence • Social, emotional and healthy living competences • Digital competence
Connections with Eco STEAM	**Eco** - Improvement of air quality with the production of oxygen for a healthy environment. Science – Obtaining oxygen through the process of photosynthesis. Technology – Creative use of information technology. Engineering – Developing a model for improving the quality of oxygen in the place of residence. Art – Develop skills in the art of visualization, drawing photosynthesis cycle. Math – Mathematical calculations when making a solution of baking soda (5 g/L).
References	• https://www.britannica.com/science/photosynthesis • https://www.youtube.com/watch?v=Uiuct-2yAxA

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Notes	It would be impossible to overestimate the importance of photosynthesis in the maintenance of life on Earth. If photosynthesis ceased, there would soon be little food or other organic matter on Earth. Most organisms would disappear, and in time Earth's atmosphere would become nearly devoid of gaseous oxygen. The only organisms able to exist under such conditions would be the chemosynthetic bacteria, which can utilize the chemical energy of certain inorganic compounds and thus are not dependent on the conversion of light energy.

Activity 2 Self-Assessment Table

Evaluation criteria	Points	Comments
Proper handling of laboratory equipment and reagents	_/5	
Effectiveness of planning **Poving the set hypothesis**	_/5	
Writing equations for the photosynthesis process, graph and poster	_/5	
Ability to act according to the plan Description of the process of photosynthesis and producing an oxygen	_/5	
Creativity Collaboration Effort Skills in presenting about Local Environmental Challenges and Solutions	_/5	
What worked		
What needs to be improved		

5.2.3. ACTIVITY PLAN: CREATIVE WORKSHOP "SUSTAINABLE CITY"

Introduction part (or activity overview)	Creative workshops are interactive and inspiring events where students can create, experiment, and collaborate with each other, creatively solving specific problems or achieving specific goals. Creative workshops encourage participants' activity, collaboration, and creativity in creating a sustainable city plan.
Setting	Classroom.
Materials Needed	Used paper and cardboard boxes of various sizes.

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	Packing paper, cardboard. Scissors, rulers, pencils, paper cutting knives, glue, hot glue. Acrylic paints, gouache, brushes, palettes for mixing paints. Tree branches, straw. Computers, phones.
Learning Outcomes	• Ensure that the homes created are sustainable, made using recycled materials. • Encourage creativity in designing homes that are efficient, aesthetically pleasing, and sustainable. • Develop responsibility and collaboration. Students will work in teams, share ideas, and create together towards a common goal. • Promote a sustainable lifestyle by presenting their projects and sharing their ideas with the community.
Activity Contents	**Activity1:** **Theoretical Part** (duration: 20 min.): Step 1. Information on material sorting, recycling process, and sustainability principles. (The theory, questions, and discussion topics are adapted according to the students' age.) https://www.zaliasistaskas.lt/teisingo-rusiavimo-atmintine/ Correct Sorting Memo (material for the teacher) Correct Sorting Memo. Sorting is a commendable decision. However, it is equally important to do it correctly: throw glass into the green, paper and cardboard into the blue, and plastic, metal, and combined packages into the yellow container. https://gamtosateitis.lt/kaip-teisingai-rusiuoti-atliekas/ Step 2. Discussion on waste recycling, its importance, and benefits for the environment. (questions, topics for discussion) • What needs to be known when disposing of paper packaging? • Where does sticky tape go? • Are egg packages considered contaminated waste? How should they be sorted? • What does plastic-coated paper look like and how is it sorted? • Are markers and colored pencils sorted? • Where to throw drawings colored with markers, pencils, watercolors, or gouache? • Where to throw an envelope with bubbles? And where to throw an envelope with a plastic window? • Can only dry packages be thrown into sorting containers, or can they also be wet? • By sorting waste, we turn it into raw material: recycled waste becomes materials for new packaging. This saves dwindling non-renewable resources. • We fight against climate change: sorting reduces the emission of harmful gases released by waste decomposition in landfills. • We save energy: recycling waste saves energy that would be used to produce new packaging. **Task 1** (Duration: 2.5 hours): Students divide into groups (2-3 students). Creating a building (house) from used packaging. Step 1. Idea Search and Selection.

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	Online or in their surroundings, students look for examples of buildings. They photograph, sketch, or otherwise save their favorite buildings. Communicating in groups, they discuss ideas and select the one they like the most. Step 2. Creative Process. Based on the chosen idea, a house (building) is created. The creative process uses used paper and cardboard boxes, packing paper. Parts of the building are glued together. Step 3. Finalizing the Object. The completed house is decorated (colored with paints or using advertising posters, old magazines, etc.) Step 4. Evaluation and Self-Evaluation. An evaluation and self-evaluation table is used (APPENDIX 1) **Task 2** (Duration: 1.5 hours): Designing a city from the created separate buildings (houses). Step 1. The city is composed of individual, decorated houses (buildings). A city is created from the built buildings, focusing on the principles of sustainable city creation. Streets, squares, trees are composed. In this part, straw, tree branches, packing paper can be used. The principles of the sustainable city plan include various aspects aimed at creating a living environment that is harmonious, ecological, socially just, and economically sustainable. Step 2. Created sustainable city plans, consisting of created buildings (houses), streets, green areas are exhibited, photographed, a collage and a virtual exhibition can be created. (FIG. 1)
Assessments	The created buildings (houses) and city plans are evaluated with points. For evaluation, a table can be used. (APPENDIX 1)
Key Competences	• Creativity competence • Digital competence • Communication competence • Citizenship competence • Cultural competence
Connections with Eco STEAM	Eco - The city created using recycled materials, packaging, and paper. Science - Engineering solutions will be based on reliable knowledge and data. Technology - Create a modern, efficient, and sustainable city that meets the needs of contemporary residents and ensures sustainable urban development for the future. Engineering - The sustainable city will create innovative environments and spaces. Art - The activity will encourage creativity and community participation. Math - Mathematical knowledge will be used to calculate the layouts of building walls.
References	How To Make Beautiful Small Cardboard House I DIY Miniature Cardboard House https://www.youtube.com/watch?v=duSxL5xr2Lk&ab_channel=NazimIdeas Duration: Approx. 4.46 minutes https://www.youtube.com/watch?v=pENbFSv06BA&ab_channel=FUNLIFE Duration: Approx. 6.46 minutes

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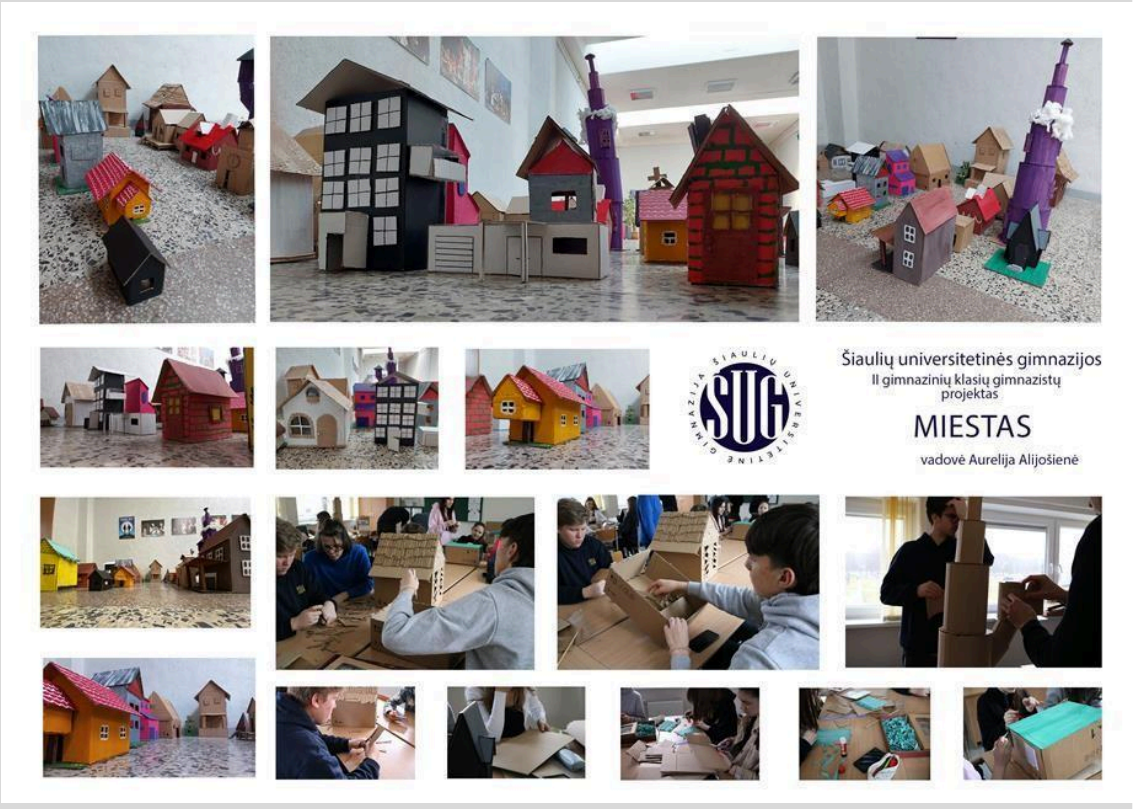
Notes

The city created is presented to the community, highlighting environmental protection and the conservation of natural resources, as well as promoting respect for environmental protection and the conservation of natural resources in urban planning (green areas, forest conservation, maintaining water and air quality, sustainable use of water and energy).

It is important to ensure that the presentation is clear, transparent, and engaging to foster constructive cooperation and dialogue.

The model of the created sustainable city aims to show how a city can be developed or improved in a way that considers sustainability principles, aiming to reduce the negative impact on the environment and improve the well-being of its inhabitants.

It's also possible to create lighting for the city and buildings.



APPENDIX 1

Evaluation and Self-Evaluation Table

Assessment Criteria	Points	Comments
Originality	_/5	How unique and new is the creative work?
Expressiveness	_/5	How well does the creative work convey the creator's ideas, emotions, or viewpoints?

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Composition and Structure	_/5	Does the creative work have a clearly defined composition and structure? Is it well-organized and smooth, with a meaningful consistency?
Engagement	_/5	How well does the creative work engage the audience or viewer?
Technical Errors and Quality	_/5	Is the creative work technically orderly and of high quality?

5.2.4. ACTIVITY PLAN: DESIGNING AN ECO-LOGO FOR YOUR SCHOOL AND TOWN	
Introduction part (or activity overview)	Designing an eco-logo for your school and town is a fantastic way to engage students in creativity while promoting environmental awareness. This session is designed to deepen student's knowledge to create a visually appealing and meaningful eco-logo that represents sustainability and environmental consciousness for the school and town. By following this activity plan, you can empower your students to use their creativity and design skills to advocate for environmental awareness and sustainability in their school and community through meaningful eco-logo designs.
Setting	Classroom complemented by digital research.
Materials Needed	Drawing paper or computer/laptop with design software; markers, colored pencils, or digital drawing tools; reference materials or examples of logos; information about the school and town's environmental initiatives or characteristics; printer or access to printing services (if printing physical logos); projector or screen (if presenting digital logos)
Learning Outcomes	• Developing deep understanding about local environmental challenges and solutions • Improving creativity to design eco logos where the school and the city will be presented to promote the awakening of environmental awareness • Enhancing skills in digital research and in using drawing tools • Improving ability to critically analyze and discuss local environmental problems
Activity Contents	Duration: 1-2 hours per session, depending on the complexity of designs and available class time. **Activity 1. Introduction to eco-logo design, research, planning (45 minutes):** - Discuss eco-logos and their role in promoting environmental awareness, some suggestions of free websites and tutorials that can be used to create logos: www.canva.com or www.design.com https://www.youtube.com/watch?v=H3S0dEbR8rU - Students research information about the school and town's environmental initiatives, characteristics, or landmarks, they gather inspiration for their eco-logo designs considering elements such as local flora/fauna, landscapes, sustainability efforts,

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	etc. - Students brainstorm ideas for their eco-logo designs, considering key themes, symbols, and messages they want to convey, they sketch out rough drafts and make notes about their design concepts and inspirations. **Activity 2. Design development, content creation (60-90 minutes):** - Students start developing their eco-logo designs, either by hand or using design software. Creativity in the use of colors, shapes, and symbols to represent sustainability and environmental consciousness should be encouraged. - Students work on refining their designs and ensuring clarity and impact – they can write a brief description, explaining the symbolism and message behind their designs. - Students use clear and concise language that conveys the importance of environmental awareness and sustainability. **Activity 3. Presentation preparation and display, feedback, reflection, cleanup (70 minutes):** - Students practice their presentation skills and how to articulate the meanings and intentions behind their eco-logo designs. They present their eco-logo designs to the class, explaining their design choices, symbolism, and intended message. - Students give constructive criticism and suggestions for improvement on each other's designs, they have a reflection activity where students discuss their experience. - Students reflect on the importance of visual communication in promoting environmental awareness and the role of design in inspiring positive change. - Students clean up their workspaces and organize their materials. **Additional Tips:** - Encourage students to incorporate local elements and landmarks into their eco-logo designs to create a sense of connection and identity with the school and town. - Emphasize the importance of simplicity and versatility in logo design, ensuring that the eco-logos are easily recognizable and memorable. - Consider organizing a voting or selection process to choose the final eco-logo designs for the school and town, involving students, teachers, and community members in the decision-making process. - Encourage students to share their eco-logo designs with school administrators, local government officials, or environmental organizations to promote awareness and adoption of sustainable practices.
Assessments	Assessments of the level of environmental awareness among students Evaluation of the uniqueness of design ideas Ecological interpretations of design ideas Individual presentation with reference to the eco-message of the logo itself
Key Competences	• Cognitive competence • Creativity competence • Communication competence • Social, emotional and healthy living competences • Citizenship competence • Digital competence • Cultural competence

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Connections with Eco STEAM	Eco - Developing eco-awareness Science - Ecological science (studies on raising environmental awareness) Technology - Use of digital tools for design Engineering – Designing their own logos Arts - Developing creativity and ability to design Math - Data analysis about local eco challenges
References	• The academic and scientific literature on local environmental challenges • Online databases and resources for local environmental problems and solutions
Notes	• The activity should be adaptable to different local ecosystems, environmental problems and solutions. • Encourage students to reflect on their role in local and global environmental awareness.

Assessment Table for Web Quest Reports:

Assessment Criteria	Points	Comments
Depth of Research	_/5	
Understanding of environmental problems	_/5	
Accuracy of Information	_/5	
Quality of Presentation	_/5	
Use of Visuals	_/5	

Assessment Table for individual Presentations:

Assessment Criteria	Points	Comments
Comprehensiveness of Findings	_/5	
Clarity in Presentation of Data	_/5	
Understanding of environmental awareness concept	_/5	
Ecological Interpretations and Insights	_/	
Usage of digital design tools	_/5	
Use of Visual Aids in Presentation	_/5	

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5.2.5. ACTIVITY PLAN: DIY PAPER	
Introduction part (or activity overview)	Students read info on cellulose and discuss the process of getting paper, share ideas: http://indianapublicmedia.org/amomentofscience/chemical-cellulose-paper/ They also watch a video on how to make recycled paper (Duration: 5:24 minutes) https://www.youtube.com/watch?v=RR_218EtLJU&t=2s
Setting	Reusing old paper to make your own and understand the fibers that make and break it
Materials Needed	Wire coat hanger, Mesh material/ tights, A4 sized tray, Newspaper, shredded (4 capfuls), Mixing bowl, Water, PVA glue, Cotton wool, Food dye, Glitter, Spoon, Plastic bag, 2 sheets of paper towels, 4 sheets of newspaper, Rolling pin
Learning Outcomes	To understand the basis of recycling. To understand how paper is made. To understand the formation and structure of fibers
Activity Contents	**Activity 1: Realization of the paper making experiment (Duration: 80 min.)** **Theoretical part:** *Introduction discussion*: (10 minutes) **The teacher explains the steps of making paper** Step 1: Students carefully bend a metal coat hanger into a square and pull a leg of a pair tights over the hanger to make a screen. Step 2: They cover a tray with several layers of newspaper and two layers of kitchen towels above this. Step 3: Students use their hands to tear the newspaper into small pieces and put them in a bowl. They make sure they have about 4 cupfuls of shredded paper. Step 4: Add water until all the paper in the bowl is covered and leave to soak for an hour. Step 5: Add a tablespoon of PVA glue to the paper and water, then mix with your hands to make a pulp. Step 6: Add cotton wool, food colouring and/or glitter as desired and mix well. Step 7: Students put the screen on the covered tray and spoon the pulp onto the screen, spreading it out into a thin layer. Step 8: They put a plastic bag on the pulp and use a rolling pin to even out the mixture and squeeze out the water. Step 9: Students take off the plastic bag and lift the screen from the tray and place it on the piles of dry newspaper and kitchen paper. Step 10: Leave the pulp to dry for three days and carefully peel it off the screen. Students follow the steps of paper making **Activity 2: Discussion (Duration: 40 minutes)** The teacher discusses and analyzes connected topics: Cellulose chains, formation of intramolecular bonds, the strongest of which are hydrogen bonds, process of polymerization, formation of fibres, extraction from plant sources, polarity of water, drying and pressing into newly formed sheets of paper. Students discuss what they witnessed, what they produced, and how it was achieved. They share possible solutions to environmental issues, analyse sustainability in terms of reusable paper.

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	Example questions (reflection): ***Why do we need to use tights?*** This acts as a screen so excess water can be removed easily. ***Why do we soak the papers in water?*** To weaken the bonds between paper fibres. ***Why does paper strengthen when drying?*** The bonds between fibers are being reformed. ***Why do we cut the paper into smaller pieces?*** To help break apart the fibres and increase the surface area across which any reactions may occur. ***Why do we mix in cotton wool?*** The cotton makes the paper stronger. **Additional tips** ● Instead of newspaper try different paper types like printing paper, magazine paper and paper towels. ● Instead of paper use really small pieces of plastic, shredded.
Assessments	The final result is evaluated with a grade. All students in the class can be included in the evaluation. Each student independently evaluates his contribution to the work. Students can compete in the best produced paper. The evaluation takes into account: the quality of the sheet, the cost of production and the artistic expression of the final product in a frame.
Key Competences	● Cognitive competence ● Creativity competence ● Communication competence ● Social, emotional and healthy living competences ● Citizenship competence ● Digital competence ● Cultural competence
Connections with Eco STEAM	**Eco –** Recycling of old paper. Sience - Knowledge of chemistry, biology and mathematics; environmental sciences – fostering sustainability thinking. Technology - Using a computer in the research process and blender. Engineering - Frame making. Art - Taking a picture on recycled paper. Mathematics - Calculation of paper recycling costs.
References	http://indianapublicmedia.org/amomentofscience/chemical-cellulose-paper/ https://www.youtube.com/watch?v=RR_218EtLJU&t=2s
Notes	-

Assessment Table for individual work:

Evaluation Criteria	Points	Comments
Quality of produced paper	_/5	
Understanding the basis of recycling	_/5	
Understanding how paper is made	_/5	

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Understanding the formation and structure of fibres	_/5	
Communication competence	_/5	
Cognitive competence	_/5	
Competence for creativity	_/5	
Answered questions correctly	_/10	
Completed homework	_/10	

Assessment Table for group work:

Assessment Criteria	Points	Comments
Internet research skills	_/5	
Artistic expression of the final product in a frame	_/10	
Calculation of cost price	_/5	
Ecological Interpretations in the project	_/5	
Teamwork and Collaboration	_/5	
Skills of presenting the work	_/5	

5.3. SUBTOPIC. CULTURAL AND SOCIAL DIMENSIONS OF ENVIRONMENTAL ISSUES

5.3.1. ACTIVITY PLAN: EXPLORING THE CULTURAL IMPACT OF ENVIRONMENTAL PRACTICES

Introduction part (or activity overview)	This activity investigates how cultural and social frameworks shape environmental behaviors and practices across different communities. By understanding the cultural roots of environmental issues, students will appreciate the need for culturally sensitive approaches to sustainability. The session aims to cultivate awareness of the social and cultural dynamics that influence environmental decision-making and to foster innovative solutions that respect these complexities.
Setting	Location: Classroom equipped with computers and internet access. Educational Context: Collaborative group work (2-3 students per group).
Materials Needed	Computers with internet access Projector and screen for video presentations Art supplies including paper, markers, and colored pens for creating visual aids Access to online databases and journals for research
Learning Outcomes	• Identify and understand the influence of cultural and social factors on environmental behaviors. • Critically analyze how different cultures approach environmental conservation. • Create a culturally informed environmental advocacy plan.

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Activity Contents	**Theoretical Part (Duration: 50 minutes)**: Begin with an introduction to the concept of cultural ecology, which explores the relationships between cultural beliefs and habits and their ecological consequences. Discuss various aspects such as: ● **Cultural Relativism in Environmental Ethics**: How different societies have their own ecological morals that guide their interaction with nature. ● **Religious and Spiritual Influences on Environmentalism**: Examples from various religions that dictate how followers should treat the environment, such as the concept of stewardship in Christianity or Dharma in Hinduism. ● **Impact of Modernization and Globalization**: How global economic development influences local environmental practices and often leads to conflicts between traditional practices and modern environmental policies. ● **Video Resources**: o "Cultural Dimensions of Ecological Management" (https://www.youtube.com/watch?v=exampleLink1) – This video discusses how traditional ecological knowledge is crucial in modern environmental management systems. o "Globalization and Environment: Cultural Perspectives" (https://www.youtube.com/watch?v=exampleLink2) – Explores how globalization impacts local cultures and their traditional environmental practices. **Task 1: Comparative Cultural Analysis (Duration: 60 minutes) Step 1**: Students select two cultures with distinct environmental practices. They use online resources to gather data on how each culture traditionally interacts with the environment and how these interactions have evolved in response to contemporary environmental challenges. **Step 2**: Prepare a PowerPoint presentation comparing: ● Historical and contemporary environmental practices in each culture. ● Case studies of environmental issues faced by each culture and the solutions adopted. ● Evaluation of how traditional knowledge has been integrated into modern environmental solutions. **Step 3**: Presentation and class discussion. Each group presents their findings, focusing on the integration of cultural respect in solving environmental problems. **Task 2: Culturally Informed Advocacy Plan (Duration: 50 minutes) Step 1**: Based on their earlier research, each group selects one cultural context and identifies a pressing environmental issue relevant to that context. **Step 2**: Develop an advocacy plan that: ● Outlines specific, culturally sensitive goals to address the issue. ● Identifies the target audience and tailors the message to resonate culturally. ● Plans strategic actions, considering cultural norms and values, to achieve these goals. This might include community workshops, local leader involvement, or traditional media campaigns. ● Designs preliminary campaign materials tailored to the cultural specifics of the audience.**Step 3**: Peer feedback session where groups exchange plans and provide constructive feedback focused on cultural sensitivity and practical feasibility.
Assessments	Depth and cultural sensitivity of the research. Clarity and persuasiveness of comparative analyses. Creativity and cultural appropriateness of advocacy strategies.

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	Engagement and effectiveness in class discussions and feedback sessions.
Key Competences	Communication and intercultural competence Analytical and research skills Creative problem-solving Advocacy and ethical reasoning
Connections with Eco STEAM	Eco and Arts: Leveraging cultural arts to promote ecological messages. Science and Technology: Utilizing scientific research and digital tools to understand and address cultural environmental issues. Math: Analyzing statistical data to support environmental strategies tailored to cultural demographics
References	www.culturalenvironment.org
Notes	This activity may require additional sessions to allow for thorough research, detailed planning, and robust discussion.

Evaluation Table No. 1.

Evaluation Criteria	Points	Comments
Student's contribution to the work	_/2	
Completeness of the report	_/5	
Presentation	_/5	
Advertisement created	_/5	

5.3.2. ACTIVITY PLAN: CULTURAL PERSPECTIVES ON ENVIRONMENTAL PRACTICES	
Introduction part (or activity overview)	This activity explores the cultural and social dimensions of environmental practices. Students will research how different cultures approach environmental conservation and create multimedia presentations to share their findings.
Setting	Location: Classroom for research and presentations. Educational Context: Collaborative group work.
Materials Needed	Research materials (books, articles, internet access) Multimedia tools (e.g., video editing software, presentation software) Projector for presentations
Learning Outcomes	• Develop understanding of the cultural and social aspects of environmental issues. • Enhance skills in research, multimedia creation, and presentation. • Improve abilities in critical thinking and cross-cultural communication.
Activity Contents	**Theoretical Part (Duration: 60 minutes)**: Begin with an introduction to the cultural and social dimensions of environmental issues.

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	● **Introduction to Cultural and Social Dimensions**: ○ Discuss how different cultures perceive and address environmental issues. Highlight the role of traditional knowledge and practices in conservation. ○ Present examples of cultural approaches to environmental conservation from various regions. ● **Video Resources**: ● "Cultural Perspectives on Environmental Conservation" https://www.youtube.com/watch?v=-r2eRVXzH0U **Discussion Prompts**: ○ How do cultural beliefs and practices influence environmental conservation efforts? ○ What role does traditional knowledge play in modern environmental practices? ○ How can we integrate cultural perspectives into global environmental policies? **Task 1: Research and Preparation (Duration: 90 minutes)** **Steps**: 1. Divide students into groups, each assigned a different region or culture. 2. Use provided materials to research how the assigned culture approaches environmental conservation. Focus on traditional practices, modern adaptations, and the cultural significance of these practices. 3. Create a multimedia presentation that includes videos, images, and text to showcase the research findings. **Flow Chart**: Form Groups --> Conduct Research --> Prepare Multimedia Presentation **Task 2: Presentation and Discussion (Duration: 90 minutes)** **Steps**: 1. Each group presents their multimedia project to the class. Highlight key cultural practices and their impact on environmental conservation. 2. Engage in a class discussion about the different cultural perspectives presented. Discuss common themes, differences, and how these practices can be integrated into global environmental efforts. **Flow Chart**: Present Multimedia Project --> Engage in Class Discussion
Assessments	Depth and accuracy of research on cultural practices. Creativity and effectiveness of the multimedia presentation. Engagement and clarity during the presentation. Contribution to the class discussion. Teamwork and collaboration throughout the project
Key Competences	Cross-cultural communication and understanding Research and analytical skills Creativity and multimedia presentation skills Critical thinking and discussion Teamwork and collaboration

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Connections with Eco STEAM	Eco: Understanding and valuing cultural perspectives in environmental practices. Science: Investigating the scientific basis of traditional environmental practices. Technology: Utilizing multimedia tools to create engaging presentations. Engineering: Exploring how traditional engineering practices contribute to sustainability. Arts: Creatively presenting cultural practices and their significance. Math: Analyzing data related to the environmental impact of cultural practices
References	-
Notes	-

Evaluation Criteria Table for Cultural Perspectives on Environmental Practices

Evaluation Criteria	Points Available	Comments
1. Depth and Accuracy of Research on Cultural Practices	20	Assess the thoroughness and accuracy of the research conducted on cultural practices.
2. Creativity and Effectiveness of the Multimedia Presentation	20	Evaluate the creativity and engagement level of the multimedia presentation.
3. Engagement and Clarity During the Presentation	20	Rate the clarity, persuasiveness, and engagement level of the presentation given by each group.
4. Contribution to the Class Discussion	20	Assess the quality and relevance of contributions made during the class discussion.
5. Teamwork and Collaboration Throughout the Project	20	Evaluate the level of teamwork, communication, and participation among group members throughout the activity.

Total Points: 100

5.3.3. ACTIVITY PLAN: HOW CLEAN ARE YOUR HANDS?	
Introduction part (or activity overview)	Students read and discuss bacteria, hand sanitizers, skin epidermal layer and its properties. https://www.britannica.com/science/bacteria https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html https://microbewiki.kenyon.edu/index.php/Human_Hands_and_Fingernails
Setting	A lab/ Chemistry classroom or at home
Materials Needed	Petri dishes (with lid), ¼ cup of Water, 1 teaspoon of sugar, Sticky tape, 1 teaspoon of gelatin Pan for boiling, Spoon, Hand Sanitiser
Learning Outcomes	To create a suitable environment for the microbes to grow and then observe them, learn about the importance of personal hygiene.

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Activity Contents	**Activity 1: Discussion of personal hygiene (Duration: 15 minutes) Theoretical part:** Introduction discussion: (10 minutes) The teacher introduces the students to the causes of diseases and then plays a short video. Students discuss the emphasis in today's world to keep our hands clean, to maintain personal hygiene, use of hand sanitizers, the presence of microbes and bacteria in our everyday life. They watch a video of the expirement: https://www.youtube.com/watch?v=nArV1eHM-3g&t=2s (Duration: 2:05 minutes) **Activity 2: Realization of an experiment (Duration: 80 minutes)** **The teacher introduces them to the steps of making the experiment** Step 1: Boil the water in a pan. Step 2: Add the gelatin powder to the water until all of the gelatin has dissolved. Step 3: Whilst still hot, pour the gelatin into the petri dish until it is around ⅓ full. Repeat for the other petri dish. Step 4: Place in the fridge, with the lid on, for around 12 hours, until the gelatin solidifies. Step 5: Remove from the fridge and then slightly press your thumb on the gelatin and place the lid back on. For safety reasons, seal the containers tightly with sticky tape. Label the petri dishes with the date and mention in which petri dishes the hand sanitizer was utilized. Step 6: Rub your hands with the hand sanitizer and repeat step 5 using your 'clean' hand. Step 7: Leave for a few days (around 3-7 days) in a dark room at room temperature until multiple spots appear on the gelatin. These are bacterial colonies. Step 8: If you happen to have a compound or stereo microscope, try looking at the different bacterial colonies up close. Step 9: Observe whether the hand sanitizer has reduced the number of bacterial colonies present on your hand. Students conduct the experiment according to the teacher's instructions, and then discuss the results obtained. **Activity 3: Discussion (Duration: 20 min.)** The teacher discusses and analyzes connected topics: personal hygiene, use of hand sanitizers, the presence of microbes and bacteria in our everyday life. Students discuss what they witnessed, what they produced, and how it was achieved. **Example questions (reflection):** ***What are bacteria?*** Single celled prokaryotes which have membrane bound nucleus. ***Why is gelatin used as a culture medium?*** Contains nitrogen and carbon compounds necessary for bacterial growth. ***What is the effect of hand sanitizer on bacterial growth?*** Inhibits bacterial growth. ***What is a common bacterium that is present on the hand?*** Staphylococcus epidermidis. ***What is a more efficient method of cleaning hands than using hand sanitizer?*** Wash your hands with soap and water. **Additional tips, Homework:** Try using different non-toxic chemicals on your hand before conducting the experiment to see what is the most effective at killing bacteria. You might want to test if lemon juice has the ability to kill bacteria or maybe even white vinegar.

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	Are you interested in knowing how dirty your house truly is? Then why not repeat the experiment but this time taking swabs of different areas of the house such as perhaps your bed or the toilet seat. We keep food in our fridge to prevent it from spoiling. Show the effectiveness of cold in controlling microbial growth by repeating the experiment but this time placing the Petri dishes in the fridge. Compare the results obtained with the bacterial growth at room temperature and see if the fridge does reduce the rate of bacterial growth.
Assessments	The final result is evaluated with a grade. All students in the class can be included in the evaluation. Each student independently evaluates his contribution to the work. Students can compete for a correctly conducted experiment. During the assessment, the following are taken into account: The speed of work and correct implementation of all steps of the experiment.
Key Competences	Communication competence Cognitive competence Competence for creativity Artistic competence
Connections with Eco STEAM	**Eco** - Clean hands. Sience - Knowledge of chemistry, biology and mathematics; environmental sciences – fostering sustainability thinking. Technology - Using a computer in the research process, microscope, digitrons for calculation Engineering - Determining the most effective hand sanitizer Art -Making gelatin. Mathematics - Calculation of the number of bacteria after their reproduction, calculation of costs for the process of examining the presence of bacteria.
References	https://www.youtube.com/watch?v=nArV1eHM-3g&t=2s https://www.britannica.com/science/bacteria https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html https://microbewiki.kenyon.edu/index.php/Human_Hands_and_Fingernails http://www.livescience.com/51641-bacteria.html http://www.sciencebuddies.org/science-fair-projects/project_ideas/MicroBio_Agar.shtml https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html https://www.cdc.gov/infectioncontrol/guidelines/disinfection/index.html https://en.wikipedia.org/wiki/Staphylococcus_epidermidis https://courses.lumenlearning.com/microbiology/chapter/mycoses-of-the-skin/
Notes	

Assessment Table for individual work:

Evaluation Criteria	Points	Comments
Understanding which bacteria live on the	_/5	

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hands		
Understanding what personal hygiene is	_/5	
Understanding what a more efficient method of cleaning hands is	_/5	
Communication competence	_/5	
Cognitive competence	_/5	
Competence for creativity	_/5	
Answered questions correctly	_/10	
Completed homework	_/10	

Assessment Table for group work:

Assessment Criteria	Points	Comments
Internet research skills	_/5	
Production of quality gelatin	_/10	
Calculation of cost price	_/5	
Ecological Interpretations in the project	_/5	
Teamwork and Collaboration	_/5	
Skills of presenting the work	_/5	

5.4. SUBTOPIC. GLOBAL ENVIRONMENTAL ISSUES

5.4.1. ACTIVITY PLAN: ENVIRONMENTAL TAXES

Introduction part (or activity overview)	The aim is to find out what environmental taxes are in the country, why they are levied and how they help to promote a green economy, protect the environment and reduce pollution.
Setting	A classroom with computers. Educational context - small group work (2-3 students).
Materials Needed	Computer, internet, projector, paper, coloured pens.
Learning Outcomes	• Understand how taxes can be used to encourage environmental protection and how their impact can have broader social and economic consequences. • Collect information about environmental taxes in the country, prepare reports, and present them in class. • Create an advertisement about one environmental tax that will encourage sustainable behaviour
Activity Contents	**Activity1: Environmental Taxes.**

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	Theoretical part (Duration: 30 minutes): Information is provided on what taxes are – payments of a mandatory nature set by law to the state (municipal) budgets. Environmental taxes are those taxes aimed at taxing activities that harm nature. They are based on the simple principle of "the polluter pays" and can not only stop polluting activities but also make environmentally friendly activities competitive. To transform the economy into a circular one and neutralize the negative impact on the climate, environmental taxes are necessary. Their benefits: ● Assessing the negative side effects; ● Encouraging energy conservation and the use of renewable resources; ● Deterring anti-ecological behavior; ● Motivating companies to engage in sustainable innovations; ● Taxes collected by the state and the possibility to reduce taxes in other areas; ● Protection of nature. About environmental taxes: (https://www.circulareconomy.lt/about-environmental-taxes/). It can be said that taxes that reduce environmental pollution and conserve environmental resources "punish" for activities that impoverish the environment, e.g., air, water, soil pollution, destruction of biodiversity, etc. Moreover, they allow for the application of ecological standards: consumers either pay the tax or change production technologies. For example, companies, wanting to reduce costs, implement new technologies and simultaneously reduce pollution. **Task 1 (Duration: 45 minutes):** Analysis of the country's environmental taxes. Step 1: Students analyze their country's environmental tax system: they look for information online about what taxes are applied, how they are collected, and how they are distributed to environmental projects. Step 2: They prepare reports about their country's environmental taxes. In the reports: ● identify what environmental taxes exist in the country (they can highlight all or just the main ones; or each student group is assigned one tax); ● what is the object of the tax; ● what is the tax rate; ● who pays the tax; ● what incentives the tax creates; ● what impact the tax has on environmental protection; ● how the tax affects the local or national economy (business, job creation, individual behavior); Step 3: Present the prepared reports to the class. **Task 2 (Duration: 30 minutes):** Creative task. Create an advertisement that encourages sustainable behavior using environmental taxes (each group about one tax). The advertisement can be a poster, acted out, filmed, etc. Evaluated with a grade. Evaluation table No. 1. Evaluation considers: each student's contribution, the comprehensiveness of the report, the presentation of the presentation, the created advertisement.
Assessments	Evaluated with a grade. Evaluation table No. 1. The evaluation considers: each student's contribution, the completeness of the report, the delivery of the presentation, the advertisement created.
Key Competences	Communication competence

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	Cognitive competence Digital competence Cultural competence Social, emotional and healthy living competences Creativity competence
Connections with Eco STEAM	Eco - encourage thinking about various environmental aspects. Science - learn to give arguments about the benefits of environmental taxes. Technology - use of the computer for information search and report preparation. Engineering - improve technological skills by creating advertisements. Arts - incorporate artistic aspects in preparing presentations and advertisements. Math - mathematical skills in analyzing environmental taxes.
References	https://www.circulareconomy.lt/apie-aplinkosauginius-mokescius/
Notes	The activity may last 2-3 sessions.

Evaluation Table No. 1.

Evaluation Criteria	Points	Comments
Student's contribution to the work	_/2	
Completeness of the report	_/5	
Presentation	_/5	
Advertisement created	_/5	

5.4.2. ACTIVITY PLAN: GREEN BUILDING CODES AND REGULATIONS	
Introduction part (or activity overview)	This activity aims to explore green building codes and regulations, understanding their significance in promoting sustainable construction practices that reduce environmental impact. Students will investigate how these regulations are applied locally and globally and assess their effectiveness in driving eco-friendly building innovations.
Setting	**Location:** Classroom equipped with computers and internet access. **Educational Context:** Collaborative group work (2-3 students per group)
Materials Needed	Computers with internet access Projector for presentations Paper and colored pens for creating diagrams and charts
Learning Outcomes	• Identify and understand various green building codes and how they contribute to sustainability. • Analyze the impact of these building codes on local and global scales. • Develop a presentation to argue the benefits and potential drawbacks of specific green building regulations.
Activity Contents	**Theoretical Part (Duration: 45 minutes):**

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	Introduction to the concept of green building codes, which are standards and policies designed to minimize the environmental impact of building construction and operation. These regulations typically focus on several key areas: Energy Efficiency: Mandating the use of energy-efficient appliances, systems, and building practices to reduce the energy consumption of buildings. Water Efficiency: Implementing systems that reduce water usage and promote water recycling. Material Sustainability: Encouraging the use of environmentally friendly materials that are durable, recyclable, and sustainably sourced. Indoor Environmental Quality: Enhancing the health and comfort of building occupants by improving indoor air quality and incorporating natural light and views. Site Selection and Development: Promoting responsible land-use practices that respect existing ecosystems and minimize impact on them. To provide a foundational understanding, the following video resources can be viewed: https://www.youtube.com/watch?v=Q4Vlj2zoxGM- This video explains the basics of green building codes and their importance in sustainable development. Task 1 (Duration: 45 minutes): Research and Analysis Step 1: Each group selects a country and researches its specific green building regulations. Focus on areas such as energy efficiency requirements, use of sustainable materials, and innovations in green building. Step 2: Each group prepares a comprehensive report that discusses: The key components of the green building codes in the selected country. How these regulations have influenced building practices within that country. Examples of successful projects that comply with these codes. Step 3: Groups present their findings to the class, highlighting the unique aspects of their selected country's approach to green building. Task 2 (Duration: 30 minutes): Debate on Effectiveness Each group participates in a structured debate on the effectiveness of green building codes. The class will be divided into two, with one side arguing for the effectiveness of these regulations in promoting sustainable building practices, while the other side argues against, citing potential limitations or drawbacks.
Assessments	Research depth and accuracy Clarity and persuasiveness of the presentation Engagement in the debate, including use of evidence and counterarguments
Key Competences	Communication competence Cognitive competence Research and digital skills Critical thinking and analytical skills
Connections with Eco	Eco: Understanding the ecological impacts of building practices.

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STEAM	Science: Application of scientific principles in energy efficiency and sustainable materials. Technology: Utilizing digital tools for research and presentation. Engineering: Analyzing the engineering challenges and solutions in green building. Arts: Creatively presenting information and arguments. Math: Using data to analyze the effectiveness of building codes.
References	https://thetradecouncil.dk/en/en-sba
Notes	The activity may span 2-3 sessions to allow adequate time for research, discussion, and creative output.

Evaluation Table for Green Building Codes and Regulations Activity

Evaluation Criteria	Points Available	Comments
1. Research Depth	20	Evaluate the thoroughness and depth of the research conducted on green building codes.
2. Accuracy of Information	15	Assess the accuracy and relevance of the information presented in the reports.
3. Creativity	10	Rate the creativity in the presentation and report layout, including the use of visual aids and examples.
4. Clarity of Presentation	15	Judge how clearly the group presented their findings. Clarity in speech, structure, and slide organization.
5. Argumentation Skills	20	Evaluate the effectiveness of the arguments during the debate, including the use of evidence and logic.
6. Team Collaboration	10	Assess the level of teamwork and collaboration evident in the group's preparation and presentation.
7. Engagement	10	Rate the group's ability to engage the audience during their presentation and debate.

Total Points: 100

5.4.3. ACTIVITY PLAN: RENEWABLE ENERGY INCENTIVES	
Introduction part (or activity overview)	The goal of this activity is to explore various renewable energy incentives used worldwide, understand their role in promoting sustainable energy solutions, and evaluate their effectiveness in enhancing renewable energy usage. This will help students grasp how policy instruments can drive the adoption of cleaner energy sources, thus contributing to environmental conservation and emission reduction.
Setting	**Location**: Classroom equipped with computers and internet access. **Educational Context**: Small group work (2-3 students per group).
Materials Needed	Computers with internet access

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	Projector Paper Colored pens
Learning Outcomes	• Analyze different renewable energy incentives and their impact on promoting sustainable energy. • Prepare and present a detailed report on a specific renewable energy incentive, discussing its benefits and limitations. • Design a campaign to promote a renewable energy incentive that encourages the adoption of sustainable energy practices.
Activity Contents	Activity 1: Exploring Renewable Energy Incentives Theoretical Part (Duration: 30 minutes): Introduction to renewable energy incentives, which are policy measures designed to promote the adoption of renewable energy technologies. These may include tax credits, rebates, feed-in tariffs, and grants. The rationale behind these incentives includes promoting energy diversity, reducing greenhouse gas emissions, and fostering economic benefits through job creation in the renewable energy sector. Task 1 (Duration: 45 minutes): Research and Analysis Step 1: Each group selects a renewable energy incentive to study. They research online how the incentive is implemented, its financial structure, and its overall impact on renewable energy adoption. Step 2: Each group prepares a comprehensive report that covers: The type of renewable energy incentive (e.g., tax rebate, feed-in tariff) The mechanism of the incentive. The effectiveness of the incentive in promoting renewable energy Case studies or examples where the incentive has been successful Step 3: Presentation of the reports to the class. Task 2: Creative Campaign Design (Duration: 45 minutes) Step 1: Campaign Conceptualization (15 minutes) Each group spends time brainstorming ideas for their campaign. Consider the target audience, key messages, and the most effective media for the campaign (e.g., poster, digital advertisement, short video). Decide on the format of the campaign. Options include: Printed posters for local community centers or schools. Digital advertisements for social media platforms. Short informational videos for online distribution. Step 2: Content Development (15 minutes) Identify 2-3 key messages that are crucial to the incentive's promotion. For example, emphasizing the cost savings, environmental benefits, or ease of implementation. Visual and Textual Content Creation: Develop textual content that conveys the key messages clearly and succinctly. Create or select appropriate visual elements (images, graphs, icons) that enhance the message and attract attention. Step 3: Production and Review (15 minutes) Combine text and visuals to assemble the final campaign material. Use tools appropriate for the chosen medium (e.g., graphic design software for posters and digital ads, video editing software for videos). Before finalizing the campaign, each group presents their draft to another group for feedback. This peer review focuses on the clarity of the message, the

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	appeal of the visuals, and the overall impact of the campaign.
Assessments	Student's contribution to the work Completeness of the report Quality of the presentation Creativity and effectiveness of the advertisement campaign
Key Competences	Communication competence Cognitive competence Digital competence Cultural competence Social, emotional, and healthy living competences Creativity competence Mathematical and analytical skills
Connections with Eco STEAM	Eco: Promotes sustainable energy solutions and environmental awareness. Science: Understanding the science behind renewable energy technologies. Technology: Utilizing digital tools to research and create promotional materials. Engineering: Understanding the engineering principles of renewable energy systems. Arts: Developing creative presentations and campaigns. Math: Analyzing the economic impact and effectiveness of energy incentives.
References	-
Notes	The activity may span 2-3 sessions to allow adequate time for research, discussion, and creative output.

Evaluation Table No. 1.

Evaluation Criteria	**Points Available**	**Comments**
1. Creativity	10	Assess the originality and creativity of the campaign. Did the students use unique and innovative approaches to attract their audience?
2. Clarity of Message	10	Evaluate how clearly the campaign communicates its key messages. Are the objectives of the renewable energy incentive clearly articulated?
3. Persuasiveness	10	Determine the persuasiveness of the campaign. Does it effectively convince the audience of the benefits and necessity of the energy incentive?
4. Aesthetic Appeal	10	Judge the visual appeal of the campaign. Is the design professional and visually engaging?
5. Accuracy of Information	10	Check for the accuracy and relevance of the information presented. Is the information factually correct and appropriately sourced?

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6. Audience Engagement	10	Assess how well the campaign engages its target audience. Does it seem likely to capture and hold the audience's attention?
7. Use of Medium	10	Evaluate the effectiveness of the chosen medium. Was the medium appropriately chosen and utilized effectively for the campaign's goals?
8. Team Collaboration	10	Rate the level of collaboration within the team. Did all team members contribute equally and effectively?
9. Presentation to Class	10	Assess the quality of the presentation when sharing the campaign with the class. Was the presentation clear, organized, and professional?
10. Response to Feedback	10	Evaluate how the group responded to peer feedback during the review phase. Were they receptive and did they make meaningful improvements?

Total Points: 100

5.4.4. ACTIVITY PLAN: UNDERSTANDING AND CREATING ENVIRONMENTAL POLICIES	
Introduction part (or activity overview)	This activity involves students in researching existing environmental policies and regulations, understanding their impact, and creating their own policy proposals to address local or global environmental issues. The activity aims to develop critical thinking, research, and policy-making skills.
Setting	Location: Classroom for research and policy creation, online resources for research. Educational Context: Collaborative group work.
Materials Needed	Research materials (books, articles, internet access) Policy proposal templates Presentation tools (e.g., PowerPoint, poster boards) Whiteboard and markers
Learning Outcomes	• Develop an understanding of existing environmental policies and regulations. • Enhance skills in research, critical thinking, and policy-making. • Improve abilities in presenting and defending policy proposals.

Activity Contents	**Theoretical Part (Duration: 60 minutes)**: Begin with an introduction to environmental policies and regulations, their importance, and their impact on society and the environment.
	• **Introduction to Environmental Policies and Regulations**:
	  • Discuss key environmental policies and regulations at the local, national, and international levels. Highlight significant agreements such as the Paris Agreement, Clean Air Act, and others.
	  • Explain the impact of these policies on environmental protection and the challenges in their implementation.
	Discussion Prompts:

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	• What are the key elements of effective environmental policies? • How do environmental regulations impact businesses and communities? • What are the challenges in enforcing environmental policies? **Task 1: Research and Analysis (Duration: 90 minutes) Objective**: To research existing environmental policies and analyze their effectiveness. **Steps**: 1. Divide students into groups, each assigned a different policy or regulation to research. 2. Use provided materials to research the assigned policy, focusing on its objectives, implementation, and impact. 3. Analyze the effectiveness of the policy, considering factors such as environmental outcomes, economic impact, and public reception. **Task 2: Policy Proposal Development (Duration: 120 minutes)** **Objective**: To create and present policy proposals addressing specific environmental issues. **Steps**: 1. Each group identifies a specific environmental issue that needs to be addressed. 2. Create detailed policy proposals that include objectives, implementation strategies, and expected outcomes. 3. Develop presentations to communicate the policy proposals, using visual aids such as slides or posters. 4. Present the proposals to the class and engage in a Q&A session to defend and refine the proposals.
Assessments	Thoroughness of research and understanding of existing policies. Quality and feasibility of the proposed policies. Effectiveness and clarity of presentations. Ability to defend proposals during the Q&A session. Team collaboration and participation.
Key Competences	Research and analytical skills Critical thinking and problem-solving Policy-making and strategic planning Effective communication and presentation skills Teamwork and collaboration
Connections with Eco STEAM	Eco: Understanding and addressing environmental issues through policy. Science: Using scientific data to support policy proposals. Technology: Utilizing digital tools for research and presentations. Engineering: Proposing technical solutions within policy frameworks. Arts: Creatively presenting policy proposals. Math: Analyzing data and modeling the impact of policies.
References	https://www.epa.gov/clean-air-act-overview https://unfccc.int/process-and-meetings/the-paris-agreement

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Notes	This activity can be extended into a longer-term project, where students follow up on the implementation and impact of their proposed policies. Encourage students to engage with local policymakers or environmental organizations for real-world insights and feedback.

Evaluation Criteria Table for Understanding and Creating Environmental Policies

Evaluation Criteria	Points Available	Comments
1. Thoroughness of Research and Understanding of Existing Policies	20	Assess the depth and accuracy of the research conducted on existing environmental policies.
2. Quality and Feasibility of the Proposed Policies	20	Evaluate the practicality, comprehensiveness, and creativity of the policy proposals developed.
3. Effectiveness and Clarity of Presentations	20	Rate the clarity, persuasiveness, and engagement level of the presentations given by each group.
4. Ability to Defend Proposals During Q&A Session	20	Assess the quality and relevance of responses during the Q&A session and the ability to defend proposals.
5. Team Collaboration and Participation	20	Evaluate the level of teamwork, communication, and participation among group members throughout the activity.

Total Points: 100

Sample Policy Proposal Template

Section	Details
Policy Title	[Enter the title of the proposed policy]
Objective	[State the main objective(s) of the policy, e.g., to reduce carbon emissions by 20% within 5 years]

Section	Details
Background and Rationale	[Provide a brief background on the environmental issue the policy aims to address and why it is important]
Scope and Applicability	[Define the scope of the policy and who or what it applies to, e.g., industries, municipalities, etc.]
Key Provisions and Strategies	[List the key provisions and strategies of the policy, including specific measures and actions]
Implementation Plan	[Outline the steps and timeline for implementing the policy, including responsible parties]
Resources and Funding	[Identify the resources and funding required to implement the policy, and potential sources of funding]
Expected Outcomes	[Describe the expected environmental, social, and economic outcomes of the policy]

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Monitoring and Evaluation	[Explain how the policy's effectiveness will be monitored and evaluated over time]
Stakeholder Engagement	[Identify key stakeholders and how they will be engaged in the policy development and implementation process]
Potential Challenges and Solutions	[Discuss potential challenges to implementing the policy and proposed solutions to address them]
Conclusion and Call to Action	[Summarize the importance of the policy and call for support and action from stakeholders]

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