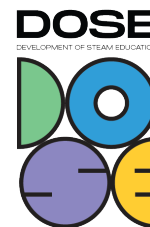


TEMPLATE for BEST PRACTICE EXAMPLES



1. Name of the project:

RAISE AWARENESS ABOUT THE PLASTIC WASTE IN THE BALTIC SEA

2. Subjects covered from STEAM areas:

STEM Subject 1 – Physics

STEM Subject 2 - Biology

STEM Subject 3 - Environmental Education (non-STEM)

STEM Subject 4- non-STEM Subject – English Language

3. Target group (age range and size of the group):

15-17 years old, size of group -25 students

4. Duration of the activity:

2020-2022

5. Key words:

Career, Plastics, Bio-based products, Bioplastics, Biomass, Citizenship, Mobile Learning, Pollution, Science and Society;

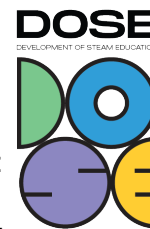
6. Key sentence describing context of the activity, followed by short description (200 words):

The project focuses on reducing pollution in the Baltic Sea, on finding solutions to reduce the input of pollutants from rivers into the Baltic Sea and protecting biodiversity by implementing concrete and sustainable actions in cooperation with local communities in Lithuania. The main goals of bringing the ocean into the classroom are improving the understanding of the ocean and developing a sense of responsibility towards our planet, to raise awareness about the impacts of plastic pollution, to understand the causes of this problem and to develop (or, at least, to discuss) possible solutions. Our gymnasium teachers take the challenge teachers motivated students in two ways: by preparing engaging STEM lessons and by connecting those lessons to real-world careers, resulting in an ongoing shortage of STEM professionals in Europe, by providing an overview of initiatives giving access to STEM professionals. Chats with experts and STEM career profiles aimed at helping students understand and appreciate the wide variety of STEM careers. This project will make use of the CLIL method: an approach where students learn a subject and a second language at the same time. A science course, for example, can be taught to students in English and they will not only learn about science but also gain relevant vocabulary and language skills.

The abbreviation “3 Rs” stands for Reduce, Reuse and Recycle. It is important to highlight the unsustainable use of raw materials and fossil fuels in the production of ordinary materials and everyday goods such as cosmetics, plastics.

Delivering a 21st-century learning experience, students are active participants in constructing knowledge, understandings and even solutions to real problems in their communities. These experiences often include approaches such as problem-based, project-based learning, extended challenges, work-based learning, and applying immersive technologies.

TEMPLATE for BEST PRACTICE EXAMPLES



7. Description of the activity environment, including the list of materials and tools needed:

Trends:

STEAM Learning: increased focus on Science, Technology, Engineering, Mathematics subject;

Mobile learning: students get access to knowledge through smartphones and tablets;

Social-Media Learning: takes place through social media channels in the curriculum;

Role-model learning engages students to elaborate critical thinking;

The six thinking hats technique is used to consider the problem from all perspectives.

Flipped Classroom: students master basic concepts of topic at home;

Lifelong Learning: learning does not stop when leaving school time spent in classroom;

21st century skills:

Real-world” problem-solving skills enhanced since they will answer complex questions and identify the pollution of the Baltic sea;

Creativity and Innovation – students create digital poster using ICT tools and work creatively with others;

Critical thinking and problem solving – students analyze information about Baltic sea pollution initiatives by six thinking hats technique; connections with ocean in their daily life;

Communication – students present their ideas, listen effectively, express their opinions about ocean pollution by plastics, being effective and polite and respecting others’ ideas and points of view. use communication for a range of purposes (combination of lectures and self-learning issues);

Collaboration – students work in groups to accomplish a common goal and share responsibility for collaborative work;

ICT literacy – ICT tools are used to research and producing the final outcomes;

Curiosity, wonder and questioning – the hands-on activities in this project give students a reason to think critically, ask questions, observe, assess information and work constructively in the teams.

8. *Step by step, detailed description of the activity, including teaching and learning strategies:*

Introducing students to the topic of plastics and bioplastics starting with an interactive video about the history of plastics. Students discover what bioplastics are and the importance of the 3 Rs, they use an article as a starting point for a discussion about the future.

The activities emphasise the biological effects of non-degradable plastics in our environment and the negative effects of microplastics.

Through the bioplastics activities, students learn about polymers, how polymers have become important in our everyday lives and the environmental consequences of their use. They investigate whether biopolymers can replace synthetic polymers.

Continuing our activities, we involved students and teachers from gymnasium of Anthousa, Greece <https://blogs.sch.gr/gymanthous> and Liceo Linguistico “Ilaria Alpi” di Cesena, Italy <https://www.liceoalpi.edu.it/>.

TEMPLATE for BEST PRACTICE EXAMPLES

Students play an active role in all stages of the project, they conducted research on microplastic particles in cosmetics, listened to lectures, participated in open discussions with STEAM(IT) scientists, and prepared STEAM (IT) career posters. Practical work- "Microplastic in the Personal Care and Cosmetics".

The online interactions with STEAM(IT) Career scientists allowed students to view scientists as approachable and to begin to understand the range of scientific areas and careers that exist.

Repository of STEM Jobs Profiles -Students find information and multimedia resources (career sheets, videos, podcasts) about exciting STEM-related careers.

Students participated in an online meeting-discussion with STEAM career NBS expert Cristina Calheiros, The Netherlands (Leading Professional in Water Resilient Cities at RHDHV).

STEAM career NBS expert Nanco Dolman from the Netherlands (Leading Professional in Water Resilient Cities at RHDHV). The aim of the meeting was to interest the students and deepen their knowledge about climate change.

The lecture "Plastic pollution of the Baltic Sea and solutions" was given by Klaipėda University Marine Research Institute researcher dr. Arunas Balčiūnas. The students learned about bioplastics, polymers, how polymers have become important in our everyday lives and the environmental consequences of their use.

Steam career together with Vilniustech -The lecture "My perfect career with STEAM in Blue Ocean" was given by VilniusTech University Environmental and Water Engineering doc. dr. Professor Marina Valentukevičiene. The aim of the meeting is to encourage the younger generation in the 21st century challenges, to develop problem-solving and critical thinking skills, to acquaint students appropriately with the opportunities of STEAM career professions.

Students solve several scientific challenges based on solving scientists' work, how it is focused on trying to improve their understandings of and explanations about the plastic pollution in the sea. Students focus on three key things: what the job entails, what education is needed for the sea pollution career, and who might enjoy of plastic pollution solving problems. Students use important details to share information about this career with their classmates.

9. Learning objectives/competencies:

- To raise environmental awareness in students and local communities by organising lectures and seminars on the negative impacts of pollution activities and the importance of conservation measures;
- To increase young people's awareness in issues about water pollution, starting with own living environment;
- To promote interdisciplinary teaching and give students a chance to discuss the concept of science through the prism of three chosen role models;
- Learn about different kinds of careers with STEAM (IT) online sessions with scientists;
- Meet scientist and learn about how their interests and backgrounds led them to their careers.
- To involve students in the study of plastic pollution in the Baltic Sea and to find solutions;

TEMPLATE for BEST PRACTICE EXAMPLES

- To develop the school curricula by performing interdisciplinary activities focused on promoting interdisciplinary teaching and give students a chance to discuss the concept of science about ocean pollution through the prism of three chosen role models.

TRENDS/TRENDS STUDENTS AS CREATORS

Mobile learning- is a new way to access learning content using mobile devices.

Project-based Learning - students put the spotlight on real world problems.

Cooperative Learning - a strong focus on group work - students work in small groups to accomplish a common learning goal.

Problem-based Learning - students can learn while engaging actively with meaningful problems.

Inquiry-based Learning - students' curiosity about a problem, related to the questions, reflect on the results.

Content and Language Integrated Learning - in CLIL students learn a subject and a second language at the same time.

STEAM Learning: Increased focus on Science, Technology, Engineering, Arts, Physics, Mathematics subjects in the curriculum. Students become more active producers and publishers of Ocean pollution educational resources.

10. Evaluation/Assessment guidelines:

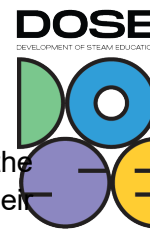
Assessment of student collaboration is based on determining the dimensions of the skill in order to evaluate appropriate problem solving opportunities within instruction. Questionnaire for the prior assessment of students' understanding- Student pre-evaluation survey;

The lesson feedback after Meeting- open discussion with scientist. Several factors influence the quality of students' online peer-assessment such as students' culture background, implementation of the online peer-assessment, and practices performance. Outcome of the class conversation during the brainstorming session and students' thoughts after reading starting articles. Short multiple-choice quiz included in this lesson, and suggestions for rewarding good test taking techniques.

TEACHERS' REMARKS

- Project development, implementation processes and results are seen as an aim for student progress in Baltic sea pollution by plastics and making solutions;
- Enduring value, continuity, relation to life (significance of results and their use in social environment, etc.);
- Appropriate use of materials, tools, devices, information sources;
- Materials and tools were used while designing lessons to address real-life problems and STE(A)M careers.
- Scientific investigations are conducted in multiple ways that rely on the collection of plastic pollution in the sea.
- The concept of what is evidence needs to be developed and should consider its credibility, acceptance, bias, status, appropriateness and reasonableness.
- Students will produce a final product Creating a collaborative magazine

TEMPLATE for BEST PRACTICE EXAMPLES



- Additionally, contextualising STE(A)M Careers in the classroom students organise in the schools a scientific STEAM(IT) Career exhibition about "Plastic pollution" to publish their Challenges about Career.

11. Lessons learned:

This project is inspired by the need to find more sustainable ways to create everyday products, be it from raw or from recycled materials. The unsustainable impact arising from the daily use of plastics, cosmetics, building materials etc. is highlighted with the aim of cultivating skills such as critical thinking and to engage students in active learning.

Through the bioplastics activities, students learn about polymers, how polymers have become important in our everyday lives and the environmental consequences of their use. They investigate whether biopolymers can replace synthetic polymers. The project is inspired by the need to use raw materials to create everyday products from recycled materials. It highlights the unsustainable impact of our daily practices, the impact of producing plastic from crude oil and what proportion of CO₂ emissions comes from our global consumption of plastics.

The activities emphasise the biological effects of non-degradable plastics in our environment and the negative effects of micro plastics.

This project inspired by the need to find more sustainable ways to create everyday products, be it from raw or from recycled materials. It highlights the unsustainable impact of our daily practices, the impact of producing plastic from crude oil and what proportion of CO₂ emissions comes from our global consumption of plastics. Solving plastic pollution, among other environmental issues, by a commitment to preparing youth to take on the challenges ahead: it focuses on changing student's perceptions of plastic as a resource and increasing student's understanding of the complexities of the issue and problem solving solutions.

12. Additional information/Links:

MEETING-DISCUSSION WITH STEAM CAREER NBS EXPERT CRISTINA CALHEIROS <http://steam.jotvingiugimnazija.lt/?p=2397>

MEETING-DISCUSSION WITH STEAM CAREER NBS EXPERT NANCO DOLMAN <http://steam.jotvingiugimnazija.lt/?p=2384>

STEAM CAREER TOGETHER WITH VILNIUSTECH <http://steam.jotvingiugimnazija.lt/?p=2656>

<http://steam.jotvingiugimnazija.lt/?p=2609>

[**Help your students find their STEM career - STE\(A\)M IT Repository of STEM Jobs Profiles \(eun.org\)**](#)

PLASTIC POLLUTION OF THE BALTIC SEA AND SOLUTION <http://steam.jotvingiugimnazija.lt/?s=Bal%C4%8Diunas#>

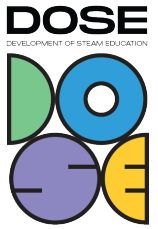
International Conference "UNDERSTANDING AND ACTING FOR A HEALTHY PLASTIC FREE SEA"

<http://steam.jotvingiugimnazija.lt/?p=2730>

http://steam.jotvingiugimnazija.lt/?page_id=206

DISCOVERY CAMPAIGN - EXCLUSIVE ASSESSMENT!

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<http://steam.jotvingiugimnazija.lt/?p=2193>

Discover the winners of the Scientix, STE(A)M IT and Professionals go back to schools competitions!

<https://dig-ed.org/discover-the-winners-of-the-scientix-steam-it-and-professionals-go-back-to-schools-competitions/>

THE CONFERENCE ON THE FUTURE OF EUROPE DISCUSSED THE ISSUE OF CLIMATE CHANGE

<http://steam.jotvingiugimnazija.lt/?p=2454>

Portal <https://www.etwinning.net/lt/>

MAKING CONNECTIONS (Lithuania-Italy-Greece)

First Networking Event: project implementation with colleagues

Second Networking Event: PROJECT "HEALTHY AND CLEAN SEAS WITHOUT PLASTICS" ACTIVITIES. <http://steam.jotvingiugimnazija.lt/?p=2548>

Third Networking Event: student's live event on 12th April at 11.10 a.m.

DISSEMINATING

<https://twinspace.etwinning.net/files/collabspace/1/81/581/209581/files/c6ab6657e.pdf>

Creating a collaborative magazine - [FINAL OUTCOME PAGE](#)

- Contact person: Irena Ribinskiene, irena196@gmail.com, Alytus Jotvingiai gymnasium, Lithuania