Natural based solutions Project
5 schools: Lithuania, Italy, Greece, Portugal, and Switzerland as an associated partner.

By observing nature we could find the solutions to face the challenges of our society. Nature-inspired solutions, Natural-based solutions, Biomimetic, Bio-inspired technology... All these terms refers to systems and solutions that have been developed after been inspired by nature. These solutions are often simple and in the same time very efficient. NBS brings more, and more natural features and processes into cities. It tends to provide environmental, social and economic benefits and help build resilience.

Students will visit compagnies or universities dealing with NBS devices, or technologies and they will do 4 practical experiments related to the NBS technology chosed. These experiments will follow the Inquiry-Based learning methodology. Thereby, students will be facing problematics that the NBS technology resolved and also students, will be put in place of the Scientist that have invented this NBS technology, while they will resolve their practical experiences.

International teams of students will discuss, and face concrete issues where the communication and organization between them will be the key of success.
All students activities will be in English while focusing on Scientific issues (Content and Language Integrated Learning ,CLIL, methodology).

Through these practical and inquiry-based tasks several key competences has been addressed simultaneously in a cross-curricular manner:
Students have incorporate and practice complex Scientific subjects while practicing a foreign language. Students have also been sensibilize to challenges faced by our society and thereby highlight the response bring by such NBS. Students have also understood the human component essential to rightly guide Science through the critical issues faced by our society.

Also, Students have figure out the importance of these issues in the construction of a respectful and integrated European society.
Teachers will also benefit of the project, by exchanging teaching methods that are highly cooperative, offering students innovative ways of learning. Which broadens teachers'practices and rises its effectiveness.Finally, participants have learn a lot about different European Cultures.

Coordenador

Istituto Comprensivo Viale Ernesto Monaci

Parceiros:

Kelme "Krazantes" Progymnasium
6th Primary School of Alexandroupolis

Agrupamento de Escolas Henriques Nogueira

"Cycle d'Orientation des Grandes-Communes" (COGC, PIC:929935412) is a middle-secondary school based in Geneva,



Please describe the practical arrangements for the planned Learning, Teaching and Training activities. How will you select, prepare and support the participants, and ensure their safety?

The selection will be in function of their motivation which will be evaluated through:
- their implication into the project through a similar research situations. It will helps to evaluate their motivation and potential implication if selected.
- a personal survey will be distributed to students in order to evaluate their ability to work in group, their motivation about sciences, their English level. Naturally, students without disciplinary problems will be chosen. An active collaboration with parents, through parents meeting in school, agreements letters, will help to ensure the safety of students.
The students if selected agree to participate before,during and after the transnational meeting. Before: in participating to extra-courses in order to obtain the scientific background needed to achieve the experiences. During: by actively participating into the experiences. After: by transmitting to the other students their knowledge obtained thanks to the transnational meeting to the students that didn't traveled.

C1 – Staff Meeting –

This will include lecturing sessions on various topics related to NBS, will be accompanied by practical demonstrations. Finally, the group will visite research centers or compagnies dealing with NBS. These visit will consolidat our practical knowledge gained through this sessions.

The aim of this training activity aims to provide partner staff members with knowledge on the NBS applications available for use by industrial enterprises and organisations dealing wit the topics addressed by NBS: Eco-economic , sustainability...

Another objective of the activity was to encourage a moment of exchange with other trainers working in the field and to share ideas on the methodology that each trainer will use in local context. In order that all partners gain more tools and skills on NBS fields to finally conduct their training programme in each target country.

These few days will fix us a common idea about the NBS project.
Consequently, our futur work will be more homogenous and more coherent. Also, locally we will share the same promoting message about our NBS project.
We hope also to motivate students by sharing and informing them about some concrete examples related to NBS.

P1 – intermediate report – 10-2020

P2 – Coordinators meeting – final report – 6-2021

P3 – Dissemination activities – local media – 01 -2020

P4 - Dissemination activities – local media – 02 -2021

P5 – NBS school event in each school – 10- 2019

P6 – Visit a local company on NBS – students that don’t travel – 09-2019

C2 - students Meeting – Science in action

Content:
Students are expected to develop practical work in interaction with peers, to carry out experiments and to explore simulations, question, present justifications and explanations, solve problems, where physics and chemistry are appropriately contextualized in order to be relevant subjects for the students, and discover their own motives for learning. These experiments will be organised in collaboration with local research centers.

In order to do so we propose a specific question such as “Is mass retained in a chemical reaction?”. This question will be explored through school the folowing activities:

Methodology:
Response to a questionnaire (eg google forms) to identify alternative conceptions of students, followed by a teacher-led group discussion to focus on the main issue;
planning an experimental activity to respond to the problem (organize resources, formulate hypotheses, discuss strategies, justify options, predict results, record data, analyse data, base conclusions, convey conclusions). The planning may be audio recorded in order to facilitate the teacher to identify skills that need further development (eg answer questions of clarification, to identify facts, observe and record, identify similarities and differences, implement procedures, state conclusions, communicate); apply the law of the Conservation of Mass by writing or reading of simple chemical equations, given the chemical formulas or the names of the substances involved - Beginning of a wiki with the contribution of all the students; analyse texts, conceptual schemas, simulations, videos with different perspectives, conceiving and sustaining a point of view, making predictions about the evolution of phenomena natural resources and the evolution of laboratory context;
Relate the practical activity and its conclusions to the consequences for the environment of the emission of pollutants from the combustion reactions, proposing measures to minimize their effects by communicating the conclusion; recognize, from an interdisciplinary perspective, climate change as one of the major problems environmental impacts and relate them to air pollution resulting from the increase of greenhouse gases;
Finally, propose different approaches to solving a problem situation (eg create an object, graphic, layout, text, video, web page, ...) in order to lead to decision making for an individual and collective intervention conducive to the sustainability of life on Earth.
For that experiment, we have the possibilty to collaborate with the Center for Environmental Education, in the Municipality of Torres, specialized in conservation of Nature.

2)
This activity will enable our school to cooperate with local research centers next to our school, and help us to build an enreching relationship

In eTwinning - Thanks to virtual exchanges participants will interacts, in smal group or indvidually. Indeed, the eTwinning platform has the benefits to be safe and easy to access for our young students. Thanks to eTwinning students and teachers will also share their local preparation works before the meeting and also students that couldn't travel will have the opportunity to participate and comment the work and the activities published on eTwinning platform.

Especially, collect and publish ont the eTwinning platform data on the emission of pollutants from the combustion in their own countries.

Finally, students will get benefits by developping a better understanding of each other, building meaningful relationships across physical borders and cultures, and practicing a foreign language and scientific skills.

How is participation in this activity going to benefit the involved participants?

This project could expands to the school and eventually fosters change in the community at large. Through this project, young people experience a sense of achievement at being able to have participate as Scienitst to solve concrete issues.
The NBS project is an ideal way for students to embark on a meaningful path towards improving Sciences. Combining learning with hands-on experiements, the whole programme is run according to an all-inclusive, participatory approach involving students with diffuculties, teachers and the local community at large.

Through this activity students get a sense of responsibility and cultivates a sustainable mindset which they can apply on a daily basis. It equips those involved with the drive to really make a difference and to spread such proactive behaviour amongst family and friends, ultimately passing it on to future generations.
Also, This activity provide an opportunity for students to share environmental informations, they can also be used as a means for cultural exchanges and for improving language skills.

C3 – Student meeting – Outdoor Activities

In the meeting there will be a vibrant mixture of sessions- pp presentations, field trips, and group work in a unique setting, designed to give participants hands-on project and research experience with nature-based solutions.We will make small research groups of 5 participants. The students will study 3 cases ( Urban environment, river environment and forest environment) and they will propose sustainable management solutions. The students and the teachers will be visiting 2 local case study sites ( River Evros and the Forest of Dadia) followed by the presentation of their ideas and findings to the school faculty and stakeholders. The goal of the group work is to identify a particular development challenge of theese areas based on NBSand get a multi-angle understanding of the problem. The pupils will propose a vision and a solution to address it with a feasible project plan. The Students reports would be collected and made available to all participants and to the local comunnity.
Also they will make products with natural ingredients (soaps of olive oil )
Methology of activities: Problem-Solving method, Environmental paths, Hads-on ( real-life) education.
For these activities will collaborate with:
-Research and Communication Laboratory for Environment and Environmental Education Department of Early Childhood Education - School of Educational Sciences - Democritus University of Thrace (Duth)
-Municipality of Alexandroupolis
-The Evros Delta Management Authority

In eTwinning

We will prepare the meeting using virtual exchanges tools of the eTwinning because it is usefull and safe for the pupils. Before the meeting, the students will learn about the culture of the partner's country with ppt presentations or video in eTwinning space. Also, they will discuss with their classmates using synchronous video conferencing and they will develop a better understanding of each other. Teachers will use the Webinar and they will present the teaching methods they will use at the meeting’s activities.

After the meeting the students will post their work in eTwinning space so students that cannot travel could participate and comment the work and the activities published on eTwinning platform and they will make their own suggestions on the research problem.

How is participation in this activity going to benefit the involved participants?

The pupils and the teachers will get to know people from other European countries and thus develop a European mentality
The pupils will acquainted and actually use new methods of study research and they will co-operate, working in groups, exchanged opinions and develop their learning and cultural backround also they will work in real- life settings thus they will educated more effectively. Furthermore they will gain knowledge for their future career plans. They will study concrete situations which will help them to realize the self-sufficient solutions based on NBS and the sustainability.

C4 – Student meeting – Exploring the surroundings of moor

Our meeting in Lithuania with groups of pupils will be in June 2020 is good for us,because that‘s the end of school‘s year.We finish our school year on 19 of June.
So my suggestions for NBS :
1.We are going to collaborate with Research Institute of Environmental Protection

Different research studies related to Environmental Engineering are necessary to ensure preservation and development of both natural and human environments. Minerals, soil, roads and railways, buildings, cities, and energetics are integral elements of the environment wich are crucial for our everyday life.
We are going to visit the Institute of Geodesy where our students will have to practise in “ Calibration laboratory“.

2.Nuclear Power Plant in Ignalina
The state enterprise Ignalina Nuclear Power Plant is carrying out the decommissioning of the INPP, which includes the operation of key systems that ensure nuclear, radiation and fire protection, as well as physical safety at the INPP, the unloading of spent nuclear fuel from power units and its transportation to the Interim Spent Fuel Storage Facility, equipment and building decontamination and dismantling, and radioactive waste treatment and storage.
3.Near our town Kelmė is some moors (peatbogs) so here we could organize sightseeing tours about nature’s resources exploitation activity.One of tours goals is rationally and responsibly use natures resources, professionally manage company’s moors which after its depletion will be re- cultivated. Look deep into nature, and then you will understand everything better.This is our goal, to look, observe , analyze and understand how important is the nature in our lives, in our world. Students will use the project experiences to learn how to treat the nature, respect it, love it and take care of it. The activities will be an important training for them in order to teach also adults how to treat the nature. The adaptation and promotion of positive values towards the nature will be certainly a giant step towards a better world in the future. Our pupils will form international teams with members from all the partners, and work cooperatively with a vested interest in each other’s learning as well as their own. The teams will play games, carry out tasks, share their discoveries and champion each other, celebrate each other’s successes, and learn to work together regardless of ethnic backgrounds.

 In eTwinnin

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Especially, collect and publish ont the eTwinning platform data on the emission of pollutants from the combustion in their own countries.

Finally, students will get benefits by developping a better understanding of each other, building meaningful relationships across physical borders and cultures, and practicing a foreign language and scientific skills.

How is participation in this activity going to benefit the involved participants?

Our Project with similar educational needs in developing basic and transversal skills using innovative methods and improving the profile of the teaching profession.By improving the quality of teaching with new ICT tools and methods, we will supply our pupils with charming ways of learning to meet pupils’ needs and expectations at the widest set of benefits.The idea of the Project mainly derives from the common problem that pupils who have low basic skills are unfortunately ignored and neglected in classes; which causes them to lose their self-assurance. That is the beginnig of the growing problem. Those pupils lose their enthusiasm and interest in lessons as well as their self-esteem. Life is not only at school but goes on also in society. Our Project will give us opportunity to learn and teach ind real life, communicating wit each other to develop a wide range of peer computence ano foster glosal cooperation.
Both pupils and teachers’ awareness of the Project and the values of the European Union will be the transnatinal necessity for better understanding and response to social, linguistic and cultural diversity.As a result of all Project-based learning activites in our Project, the teachers and pupils’ satisfaction in learning and teaching process will develop European dimension for more inclusive and enthusiastic generation.

Our goal is to extend to the influence beyond the limits of our school visits with creative and highly-functional digital resources such as apps, games and challenges that will excite and inform the pupils.We belive that an education şhould involve learning life skills to navigate and lead their life after school in order to be a well-rounded and successful person.Doing activities we will make a new pathway for youngest Europeans towards an early- experinced life condition with improved skills.

C5 – Student meeting – Bio-Pastics: Waste and recicling

In 2015 the European Commission published the final report of the Horizon "2020 Towards an EU Research and innovation policy agenda for Nature-Based-Solution and Re-Naturing Cities". This document examines the actual capability of NBS to generate ecosystem services and circular economy processes at various levels.
The NBS are considered a useful tool to enhance a sustainable urbanization, to restore degraded ecosystem, to develop climate change adaptation and mitigation, and to improve risk management and resilience. The role of NBS is to develop action models capable of combining environmental needs with social and economic needs.

Urban green areas are a fundamental resource for urban sustainability and citizens’ quality of life. They contribute to environmental quality in many ways: mitigating soil, water and air pollutions, ameliorating urbane microclimate and maintaining biodiversity.

During the mobility students trip, our school will encourage - thought a flipped classroom and learning-by-doing methodology - the creation of a "green classroom": teachers and experts will show to students video, pictures, experiences of local eco-system, endemic species to sensitize students about importance of bio-diversity and her conservation in order to have a more green world.

In eTwinning

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Especially, collect and publish ont the eTwinning platform data on the emission of pollutants from the combustion in their own countries.

How is participation in this activity going to benefit the involved participants?

The aim of the present work is to sensitize the students on the importance of a better integration of urban green’s ecosystem services into local planning.
Finally, students will get benefits by developping a better understanding of each other, building meaningful relationships across physical borders and cultures, and practicing a foreign language and scientific skills.

C6 – Student meeting – Teachers Final Meeting

Through this last meeting, teachers will try to collect, classify, organize, sustain and make available their results from their local school community to the european level.

This will include the production of databases and data classifications by type and subject.
Extraction of activity sheets in a simple to use format. Each Partner will stock this Activity sheets and make it available in its school and local scholar department.

This will enables that all partners gain more tools and skills on NBS fields to conduct their training programme in each target country.

Evaluation:
Final survey, with a common questionnaire about impact for all, reviewing objectives, products and its viability/usability, satisfaction, feelings about European partnership and chosen means of dissemination in each country.

With other institutions involved:
- To get to know the effects on schools, within the partnership and outside schools.
- If project work has been recognized outside school and about the improvement of the school’s reputation (e.g. in newspaper articles and questionnaires to the parents

Surveys separately by each school will be collected and analyse about : - Teacher resources and capacities to run the project as planned.
- Organizational problems met
- Reports about activities prepared.

- The impact & motivation on activities performed,
- The participation in mixed international groups
- The knowledge of partner countries, school systems and cultural aspects - Teacher and student satisfaction about the meeting

In eTwinning

eTwinning platform will play a key role. Indeed it will be used to collect, classify materials. Indeed, the activities sheets, the experiments supports and the illustrating media files will be upload on the eTwinning platform after each training events.

Etwinning platform will help us to collect safely the surveys. We can also invite each students or teachers to answers the surveys in safe manner on the eTwinning platform.

How is participation in this activity going to benefit the involved participants?

The participants will share activities sheets product in different countries in europe. Consequently, these documents will be precious because through them we could understand a different way of practice in a foreign country and reproduce it in our own country.

The result of these surveys will guide us and give us feedback on the favorite activities choosen by students. Also, the surveys will also give us infromations about the mistakes to avoid. Next, All this informations will be share in our database. Consequently, a futur local colleague will choose its activity with the maximun details and knwoledges about the feasability of each activity sheet.

How are you going to assess if the project's objectives have been met?

Both qualitative and quantitative methods like questionnaires, interviews, analyses of TS platform, feedback given by students and teachers and commentary from colleagues after watching lessons, will be provided in order to evaluate the effectiveness of the cooperation and spreading of the material. We will use monitoring instruments or evaluation tools, e.g. MICE (www.mice- t.net/mice.html) and/or QaS (Check-list for monitoring for on-going European partnerships“ (Quality and sustainability).

As a starting input, each school will carry out a survey to establish their students attitude and motivation towards mathematics.

BEFORE each meeting, a survey with all participants will be done to reflect about: - Satisfaction with the project
- Team working among teachers and students
- Quality of students' work

- Impact on each mathematics department and the staff
- Implementation of examples of best practices in the curriculum
- Self-analysis of getting to know new ideas and trying out new type of lessons.

AT each meeting, the project aims will be reviewed in order to know how much progress has been achieved. Any obstacles will be addressed and future action and fine-tuning will be taken on this basis.

AFTER each meeting, surveys separately by each school will be done about : - Teacher resources and capacities to run the project as planned
- Organizational problems met
- Reports about activities prepared

- The impact & motivation on activities performed
- The participation in mixed international groups
- The knowledge of partner countries, school systems and cultural aspects - Teacher and student satisfaction about the meeting.

A final survey will be carried out with a common questionnaire concerning the impact for participant countries, satisfaction, feelings about the European partnership and chosen means of dissemination in each country. Also, objectives and products will be reviewed together with their viability/usability for other teachers.

A survey will also be carried out with other institutions involved:
- To get to know the effects on schools, within the partnership and outside schools.
- If project work has been recognized outside school and about the improvement of the school’s reputation (e.g. in newspaper articles and questionnaires to the parents).

How will the participation in this project contribute to the development of the involved schools in the long-term? Do you have plans to continue using the results of the project or continue to implement some of the activities after the project's end?



We will include every project ́s activity in our lesson plans of relevant classes/age groups since in each part of our official curriculum it is clearly specified that we have to include real life situations: from the general objectives, through the contents, until the evaluation criteria. There is a specific general key, Mathematical competence where every subject should include real life activities for developing it.

Examples of good practice will be shared with colleagues, tried out, then be evaluated and perhaps later implemented in our school curriculum. Also, as we use School Education Gateway and its Teacher Academy to put Online our material developed through the project. It will remain available as long as School Education Gateway is available.

By including some project's activities and results in our lesson plans we will also ensure after the end of the EU funding a continuous use of the project's results and activities. Also the WIKI websites will be linked to our schools in this was it will stay available and continuous to progress with other new activities in the same field even after the end of the EU funding.

IN EACH SCHOOL:

a) Regular reports for the math department at meetings, via TS
b) Offering the produced hands-on material to teachers of parallel learning-groups, encouraging them to use it
c) Informing in general all interested parties on the schools’ website/related blog rather continuously d) Informing more specific about aims, activities, outcomes in school bulletins, publications or newsletters
e) Informing staff of the ongoing of the project in meetings
f) Establishing and regularly updating a Comenius showcase at each school for students
g) Adding the project to the school program – often read by parents who intend to subscribe their children to this school
h) Project presentation in collaboration with the students to e.g. parents at the Open Day or Parent Conference Day

IN THE LOCAL COMMUNITIES:

a) Articles in local newspapers e.g. after each meeting or inviting local radio; television when being the hosting country (if poss.)
b) Using QR-code on flyers, posters, movable walls nearby school or at places of public interest e.g. public libraries

c) Presenting the project at Open Days of European institutions (Germany: “Europe direct” in Unna) d) Presenting the project to a trainee teacher seminar for teachers ( Germany)
e) Within the team there are experienced teacher-trainers who aim to integrate the results of the project in the teacher training in their respective countries.

IN THE WIDER COMENIUS COMMUNITY:

As an E-twinning project it easy to share all information. Publications of material will start as early as possible. The public part will be updated regularly. By this and by useful entries (after one year) in the EST-database the results will be disseminated to the Comenius Learning Community. At the end all results will be neatly arranged in a WIKI for other teachers who like to benefit from our examples of good practice. From our school homepages we will set up a link to the Twinspace. Some countries will also upload material additionally to Moodle platform and/or school homepages. We will also promote our TS to the world wide biggest database ”Mathforum” (www.mathforum.org), other national and international internet portals for math teachers as well as in suitable E-twinning groups. Perhaps some countries will apply for the national e-twinning quality level (if it is still maintained) after some work. If possible we will publish articles in mathematics teacher magazines.