“Engaging students in the learning process through innovation”

(ESTI)

2017-1-ES01-KA219-037963

Multimedia guide

Index

The multimedia guide which includes a teachers training course on CPS , STEM practice and school activities on phenology, augmented reality, 3D use etc. and new methods like learning by doing, cooperative and active learning as a transversal methodology for the study of curricular subjects. The guide includes multimedia resources that brings in school practice innovation, creativity and motivation to young people engage in learning practice and contiuing doing it through their life. It'll also includs learning scenarios on STEM subjects.

This is the training sesion implemented in January 2018 at CPI O Cruce.

Teacher training 15- 19th January

15th at 9:30	**15th** at 11:30	**15th** at 14:00
Introduction to inquire based learning and collaborative solving problem. Examples	**Coding**: learning to do Appss with app inventor	Phenology: Examples- Poland
16th at 9:30	**16th** at 11:30	**16th** at 14:00
Examples of activities with Scratch: videogames- Examples	Examples of activities with Scratch: stories:examples	*Robotics Rasberri Pi: examples*
17th at 9:30	**17th** at 11:30	**18th** at 14:00
Robotics: Arduino+ Scratch: examples:	Robotics: experiences with Sfero	Robotics
18th at 9:30	**18th** at 11:30	**18th** at 14:00
Computational thinkig:	Drons	Hands on Robotics
19th at 9:30	**19th** at 11:30	**19th** at 14:00
Computational thinkig: Blippar: Augmented reality , examples	Aumented Reality	Creating examples with Augmented reality

1st Blended Mobility and students Training in Poland 14- 18th may 2018

14th at 10:00	**14th** at 11:30	**14th** at 14:00
Welcome meeting at school	Actionbound City game students	Excell "Shopping with your . " Chorzów in big numbers "Poland Scratch- Italians
15th at 9:30	15th at 11:30	15th at 14:50
Lectures and activities at Silesian University	Computational thiking activities.Students WQ Chorzów my town, Quiver	Visit to mine "Królowa Luiza " Zabrze
16th at 9:30	16th at 11:30	16th at 14:00
3D printer Spain A Real company at our school	QRcode- Spain Robotics: Mbot, makeblok	Visit to the planetarium
17th at 9:30	17th at 11:30	17th at 14:00
A Trip to krakov	A Trip to krakov	A Trip to krakov
18th at 9:30	**18th** at 11:30	**18th** at 14:00
Augmented Reality- Spain	AppInventor Quiz game Poland	Phenology- Poland

2nd blended mobility and students training ITALY 25-29 March 2019

25th at 9:00	**25th** at 11:30	**25th** at 14:00
Welcome meeting at school	Robotics Workshop (Italy) -MBOT -APP INVENTOR -MAKEY MAKEY	Transnational meeting
26th at 9:30	26th at 11:30	15th at 14:00
Workshop (Spain) -E-portfolio -Blender	Augmented Reality - Real enterprizes at school - Survey about food (Italy) -Kahoot game	Transnational meeting
27th at 9:30	27th at 11:30	27th at 14:00
09.00 Walking around Naples	09.00 Walking around Naples	09.00 Walking around Naples
28th at 9:30	28th at 11:30	17th at 14:00
Workshops -PHENOLOGY Italy-Poland-Spain-Romania	Workshops: -APP INVENTOR Poland -ROBOTICS Romania	Visit to S. Alfonso museum in Pagani
29th at 9:30	**29th** at 11:30	**29th** at 14:00
Workshops in Pompeii Ruins	Workshops in Pompeii Ruins	Free time

General overview &Project results

Project partners believe that only an innovative and open minded teacher is able to develop motivated, inquisitive and well prepared students for today's challenges. We think that only learning through collaborative solving problem (CPS) , inquire based learnind, based on STEM philosophy can be used as a contributor of innovative solutions to the learning process of Maths, Science and technology which is one of challenges in education today. Partners think that media belongs to everyday life of young people, so the use of digital media in education provides extra motivation and is based on students' interests and daily realities.

Our proposal tries teachers learn to deal with innovative methods and tools in preparing their lessons in Maths, Science, technology, engenearing... this allows them not only to make scientific observations within their local environment and gather new data in an intuitive and engaging way, but also to acquire complex knowledge, by collaboratively creating and sharing information, using tailored educational tools to analyse and reflect on graphical, spatial and mathematical data sets transnationally. Teachers have been able to produce attractive learning materials based on STEM curricula, and integrate the work across the curriculum. Schools designed and implememted a course for teacher traininng to enable them to create their own projects to use in class, but also a network to work on phenology, augmented reality and collaborative solving problem led to an engaging learning experiences, integrated curricula of European students. The direct target group and beneficiaries of the project's work and results are teachers, because of their position in changing classroom practices to facilitate and enhance students learning; other target groups are students, teacher trainers and educational authorities.

ICT has huge potential to enable issues-based and inquiry-based education from Primary school, as well as to increase the relevance and application of the disciplines in which they are used (Maths, sciences, techonology etc).

The project aims to support teachers providing recommendations, methodological material that can contribute to increase the sense of innovative, initiative and their level of digital and and collaborative solving problem. The CPS model has demonstrated effectiveness with children and adolescents in a wide range of challenges through a variety of different approaches. Collaborative problem solving helps students to take responsibility to manage their own affairs.

Science subjects seem to be a problem for a large number of students in European schools. School science subjects are considered " difficult" and require high levels of abstraction. This leads to the interest of young Europeans' in the science subjects has decreased, both during their Secondary education and as career opportunities.

There is growing concern that Education systems are not preparing a sufficient number of students, teachers, and practitioners in the areas of science, technology, engineering, and mathematics (STEM).

STEM Education tries to transform the typical teacher-centered classroom by encouraging a curriculum that is driven by problem-solving, discovery; inquiring & exploratory learning, and require students to actively engage a situation in order to find its solution. By adopting the STEM philosophy (Science, Technology, Engineering, and Mathematics) all subjects are an integral part in the teaching of the whole. Technology and methods provide a creative and innovative way to problem solving and students be able to apply what has been learned to a real task. Students got benefit from the STEM program because it allows students to explore greater depths of all of the subjects by utilizing the skills they have learned. We also included STEAM making some projects with Art.

Many of the topics in the science curriculum deal with processes that are hard to visualize because they are not accessible or have a size that does not allow us to approach them. The main features of AR as an educational technology are its visualizing power, presenting objects and processes in ways that are different from textbooks. We tried students learn sciences using augmented reality, students and teacher are able to create materials for tectonic plates, photosynthesis, etc .

Aumented Reality is a very usefull to study natural sciences, we have experience in use it to study the photosíntesis, rocks, different type of trees ... We also apply it to other subjects like study of Art. Our students are very happy to us it in their lessons or projects; we produce Augmented Reality with Blippar

Download Blippar app in your telephone / Ipad , enter the code 790393 and watch it.

Many of the topics in the science curriculum deal with processes that are hard to visualize, the main features of AR as an educational technology is presenting objects and processes...

Teachers were trained to create their lessons using the most advanced and innovative methods and tools through teacher trainning, but also through students blended mobility and by sharing materials, tools and assessment methods.

In line with our aim of go in deap in science studies our students had the oportunity to observe small changes that occur in living organisms through the seasons (the science of phenology). Students used mobile devices (phones and tablets) to study the plant and animal life cycle and how these are influenced by seasonal and inter-annual variations in climate, in differents countries. (Phenology)

Educating in the 21st century requires training students in a different way: Students need a high degree of information literacy skills, perform activities that allow them to transform information into knowledge eg. make presentations, Apps, videos. Teachers must integrate ICT tools in the learning processes as long as they represent an add value to the process.

We try students become creators of learning products and feel more involved in the process and even in the training of other students. We proposed multidisciplinary activities that stimulate students to apply their knowledge into practice, strengthen logical thinking; analysis and synthesis. The methodology we used is active and learning based on solving problems in a collaborative and creative way, students become protagonists of their own learning in which knowledge is very important but also pay attention to the acquisition of skills and attitudes.

Students also learn about Heritage and Literature through practical activities that they usually do during their leisure time (videos, presentations, debates ...)

To study of Science, technology and prototyping we use the term "practices" instead of a term "skills" getting involved in scientific research requires not only skills, but also specific knowledge of each practice. Science assessments do not only assess students' understanding, but also their abilities to use science and engineering practices. Both aspects have been evaluated together, showing the students that not only is it important to get to know science concepts; but also, that students be able to apply their understanding to investigate the natural world through scientific research practices, or solve significant problems through engineering design practices.

The project allows us to connect education with the business world ,. we work with various levels and especially Secondary. We also tried students perceive entrepreneurship as a positive activity and possible way for or future professional development; understanding the interest and potential gives figure of cooperativism, social economy and circular economy. In this way some of the schools (Poland and Spain) create their own business, in Spain was based on 3D printing.(entrepreneurship connected with the application of science, students had to learn BLENDER in order to do their own designs for their trade)

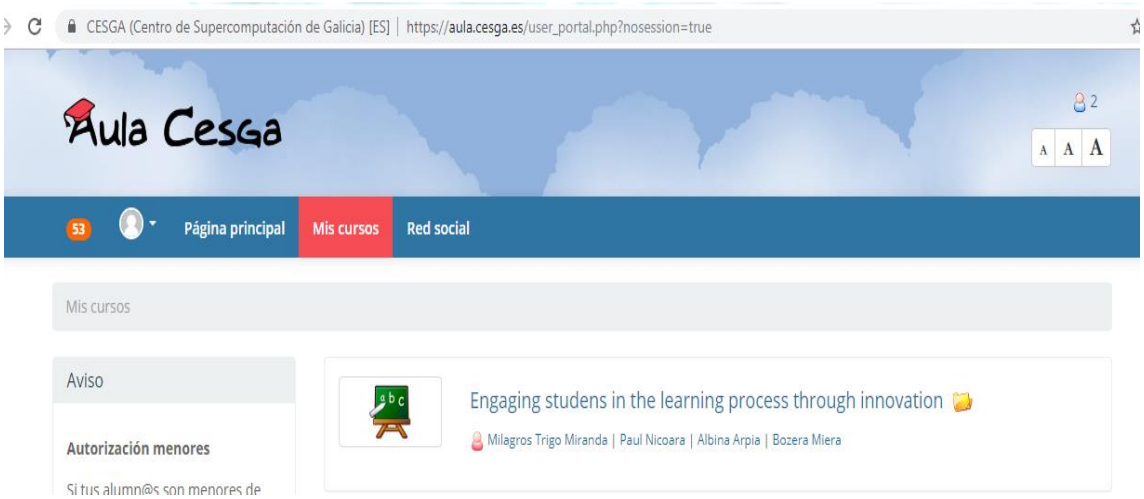
The motivation to achieve high level of knowleadge and skills when young people have rich experiences in classroom is very wide. During this project partners worked with 3D design and printing. During the fist project year we worked with Tinkercad and

CURA the last year teachers and students had the opportunity to learn how to use Blender and design objects like these

In addtion to all different objects createrd with the 3D printer; students created nozzles for different instruments such as the tuba, each one costs in the printer a tenth of what a mouthpiece costs in the shop. Mothers received "different type og vases" as a gift on Mother's Day. Students created their own business at schools; won quite a lot of money with their 3D company and they gave 20% of money earned to an ONG.

Students learn to find solutions to their needs. School won a prize "Premio de enseñanzas cooperativizadas en mayo de 2018 and other prize from A Xunta (nov 2018)"Desafíos STEM" both with 3D. Link to 3D objects

Teachers were trained to create their lessons using the most advanced and innovative methods and tools through trainning events (teachers learnt from what other teachers do and students teach other students) but also through a *platform* where teachers had the opportunity to share materials, tools and assessment methods.



Working with CPS and STEM contributed to acquire transversal skills implement other subject like history, languages. What we intend is engage students in the learning process through innovative methods and tools.

Partners also worked in a *collaborative project* on **Phenology**. Stuents used the scientific method to study the plants lifecycle Studens compare how light and temperature influence in the chestnuts, apple lifecycle etc compearing results from each country.

In line with our aim of go in deap in science study, our students have the oportunity to observe small changes that occur in living organisms through the seasons (the science of phenology). Students use mobile devices (phones and tablets with GPS) to study of periodic plant and animal life cycle events and how these are influenced by seasonal and inter-annual variations in climate, in differents countries. Exixts an App to share observation in a map, the problem is the App has only few species; schools shred photographs to do their reseach work and conclusions

Objectives and results

• Students become familiar to observing the plants and their environment

• Recognize the characteristics of the cycles of a plant.

• Identify the parts of the plant and their functions.

• Find the plants in the area, select several plants and compare them with those in other areas. (Countries participating in the project and see how the tempereture and light affects to their life - cycle)

• Use ICT for learning and familiarize the student with the use of different resources (iPad, mobile, app, ...).The App contributes stdents do observations in an scientific way and compere them with the other country.

• Stdents were able to use sciencific vocabulary to explore, explain and elaborate the observation in the APP. (The problem with the app is, it doesn't include all plant like apple tree. ,)

• Students learn to make observations, explore different phenomena, explain them, elaborate conclusions, all thse using scientific vocabulary.

• Students were able to identify spatial data in geomaps in order to compere different situations (growing , floración,...) and the influence of the environment in plants life cicle.

• The collaborative project developped in students 21st century skills such as critical thinking, decision making, autonomous learning, teamwork ... Students shared their findings in theri belended mobilitiea.

• Students showed interest and rigor about the respect and care of plants and respect for the environment, and what hapens with the same plants in other countries with different weather.

• Students learnt how to synthesize the knowledge acquired and presenting the results using different supports.

• The project encouraged discussion and exchange of ideas among students

To work through this lessons some schools used the Model scientfic method or BSCS 5E instrucional modle which includes motivation, exploration, explanation, elaboration and evaluation

- **Engagenment:** It´s about to capture students' interest. We can start observing the vital cycles of a plant and registering must teach students to make observations sice the scientific poin of view, using appropriate vocabulary...
- **Exploration:** The teacher provides hands-on experiences you can use later to formally introduce a concept, process, or skill. Students analyze different life cycles of plants (Chestnuts, apple tree,...) and the influence of the environment and anual seasons in their development. students studied the vital process that occur in each season of the year and its influence in an specific plant lifecycle.
- **Explanation:** Students articulate their ideas in their own words and debate on their own ideas. The teacher clarifies their concepts, correct misunderstandings, and introduces scientific terminology. Students are able to put in order all the information and explain it to their collegues with the support of images (from their own observations and scientific descriptions from the App and Geomap in order to have enough evidences to document all the scientific information about the plant life-cycle.
- We ask students in groups of 4 to describe the itineratio of a plant throughout the lifecicle, present it to their colleagues with the ICT means they deem most appropriate.

- **Elaboration:** it helps students to correct missconceptions and apply, expand or elaborate concepts and skills to a new situation. ***Each group of 4 students elaborates all about a plant lifecycle (eg. chestnuts) and after that analyzes what happens with these same species in other countries that participate in the project***.
  Students learn to do research work, register data, analyse results and extract their conclusions.

- **Evaluation:** As a formative evaluation, the students could use different tools for their presentations. It provides an opportunity for students to test their own understanding and skills.

Teachers used an observation sheet on students works and the new genereation skills (NGSS) to programme and asses their lessons.

The groups present their work using the digital whiteboard and another group evaluates them taking into account the evaluation criteria negotiated by teachers and students. Students rate the final product according to the criteria and a team member justifies the reason for the the mark they provide.

The students make the attached rubric and the teacher will check knowledge by making a a written quiz or students make a timeline on plants lifecycle with all these data and the observation sheet will elaborate the summative evaluation.

3. Reflection on experimentation

3.1. We analyzed the consistency of the proposed activities and tools in relation to the objectives, competences and transversal skills that we intend to develop.

3.2. The teacher justified the added value of the ICT tools used.

PhenoloGit App is useful to compare what happens in different countries and apply the scientist method to natural phenomena, the problem was we had to choose the same trees in each country and some were not included in the APP.

To asses the activity we used the rubric

How do the ligt and temperature influence in chest nuts tree, aple tree, etc				
	Development 1	Improvement 2	Advanced 3	Mark
Critical thinking	I am not able to analyze situations and argue reasoned and make own decisions I do not recognize the weaknesses of a line of reasoning	I am able to argue reasoned, but it is difficult for me to make my own decisions I can follow a line of reasoning	I reason my decisions I recognize the weak points of a line of reasoning. I reflect on products the right information	
Authonomous learning	I am not responsible for my work, I do not meet the deadlines, nor do the proposed tasks	I perform tasks with acceptable quality, I just do what I am asked to do. I have the work when I'm asked to	I perform the requested activities in a creative way, I contribute all the data that I consider relevant. I have the works ready before the deathline	

Learning to learn	I don't feel positive about learning I don't like solving problems I can't use strategies to make my learning easier	I don't feel positive about learning I don't like solving problems When I find a difficult task I don' try to go on I 'm able to use strategies to make my learning easier	I feel positive about learning I don't stop when I face difficulties I know about and can use strategies to make my learning easier	
Search, collect and select information	The information found is not relevant (the photos are not the best) is not well organized. There are some errors in the information. The photos do not provide evidence, description is poor becuase I don't use the appropriate scientific vocabulary and some data are missing	The information seems to be OK, but does not include the relevant elements, all the photos belong to what we have requested. I'm able to use scientific vocabulario The descrption is fine, but there are mixed elements.	Very good search, relevant data. The photographs are the most important and show evidences on how the weather and the seasons affect the development of plants life cycle. I'm able catch ideas using scientific vocalulary. Very good description and relevant data	
Team work	Poor cooperation in group. Most of the work was done by only one team member	Good cooperation in group. Participation in the search has been unequal, as the contributions to the presentation	All group members have contributed to the project work Contents are appropriate and students use scientific vocabulary in the best way .	

Learned contents	Lack of clarity in the contents learned and poor vocabulary	The learned contents are accurate, but with little degree of depth Insufficient clarity of ideas, insuficient use of scientific vocabulary	The learned contents are solid, clear and precise. Accuracy in terminology and ideas.	
Final task	Scarce adjustment requested. Lack of clarity and little processing,	There is some evidence of creativity. Task performed correctly and the scientific vocabulary is appropriate but it need to be improved..	I can generate appropriate ideas, integrating into them prior knowledge Technically very successful implementation of the final task	
Pooling and final debate	There has been no information exchange and sharing between groups Pooling and debate have been significantly inadequate	Sharing and discussion have been somewhat insufficient. The working environment in the groups has been adequate	There has been sufficient exchange of information between groups and lively debate and they are able to express ideas in scientific way.	

Eportfolio and multidisciplinary projects: It helps to perceive the disciplines in a transversal and multidisciplinary way

https://mahara.ats2020.eu/view/view.php?id=16893

In the e-portfolio we find two different pages, "*teachers page*", which includes the programme, students activities, resources and all the information they need.

The "*students page*" includes the individual tasks, and collaborative task , but also it has two interesting parts "*My learning*" where students think about what they will learn in the lesson/project . This is writen by each student before starting each activity.

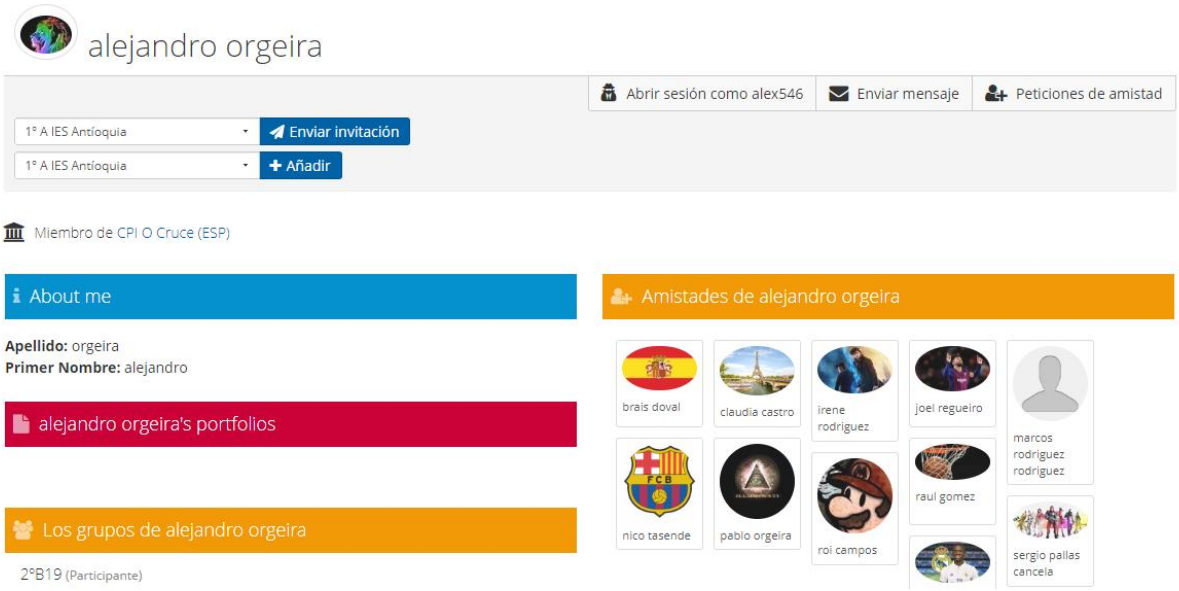
In "*My diary*" students write about what they have learnt, dificulties and strenths, we remark students that is very important to identify their weekness but also their strenths. The teacher can review their activities any time.

The eportfolio makes possible asses students competences and transversal skills and students reflect on their own learning process, see students page. For the e-portfolio we use the tool Mahara. We start to work this method in a K3 project "ATS 2020" and we shared it with our partners

https://mahara.ats2020.eu/view/view.php?id=17023

https://mahara.ats2020.eu/view/view.php?id=13929

Personal page



Robotics All schools tried to implement robotics at their school, Italy and Spain used Mbot to learn phisics like Italy or to problem solving based on evidences in Spain. Romanian students wrote things like this:

"Our dream is now under way through the project and robotics club. Terms like Blippar, Scratch, M-block will become common for us. We started studying and knowing things our colleagues did not even think about. We want the robotics team to become their "teachers," better teachers for their future. It is closely related to robotics as the stand-alone discipline within IT a global discipline that is all-encompassing. I have learned that the robots will replace the professions in repetitive tasks in the next few years, thus liberating people from not creative work. We want to promote creativity-starting with arts and coming to the technique of today and tomorrow"

Students had the posibility in schools to learn coding, robotics and Apply their knowledge to other subjects like phisics, and even literature. Schools like Romania participated in robot courses and contestets.

Play music in goups with iPads using Garage Band. Students trained at CPI O Cruce,during the last term, the idea was to play the European Anthem in the school Festival, but students need a bit more training. They didn't finished their work but is a new activity which they enjoyed very much and will go on practticing it next year..

This year at CPI O Cruce, we also started to work with **video and the camera 360º**. First we brouht the school a trainer for teachers and this was very interesting , 21 teachers participated in the activity. As always as soon teachers learn a new tool they

use it in their classes integrated in the curriculum. Students year 4 Secondary created 360ºvideos about our school. They are works made by students.

- https://roundme.com/tour/400726/view/1391722/
- https://roundme.com/tour/400734/view/1391747/
- https://roundme.com/tour/400743/view/1391815/
- https://roundme.com/tour/400745/view/1391819/

In adition to STEM we also worked with STEAM . We proposed students and open project about "The way to Santiago" students could applied any of all tools they have worked with; students leart Apps, Augmented Reality, Interviews to famous people (related to the Way to Santiago or scientists) and their podcasts. This enables students to achieve a global learning and the development of the basic competences of the student, through the practical application of learning in different contexts and shows the importance of the work of scientists in the progress and improvement of the lives of people and their countries.

Working with Plastics : We like our students get to know as much as possible about STEM , but also we like students learn to live without plastic. We established different campaigns, reflected on how to avoid the plastic use. *Students created a prototype with Lego to extract plastic from our lake and also we organiced debates*. Students year 4 Secondary did research works about the campain implemented in Primary clases (bring everyday the school luch without any plastic and the water in an aproprite bottle avoiding plastic bottles. We also organized debates on plastic uses.

Basic Activity -Debate- Research

Goals:

1. Investigate the environment arrond us

2. Reflect on individual responsibility within a collective (our town, the beach ...)

3. Analyze the data obtained and propose improvements in waste management

4. Discuss in group and justify the need for savings, reuse and recycling of materials in economic and environmental terms.

5. Identify the relevant information, determining the subject and recognizing the communicative intention of the speaker.

Execution time:

The teacher explains students a serie of orientations about the research to be carried out and the data that must be collected. During 2 months students carried out the research with a sharing during a recess on a fixed day a week. or also in tutoring class. We used

another session to analyze the results and translate them into a document. In the 3rd session we made the sharing and the analysis of the results.

Methodology:

I worked in small groups in which the students share the topics they have to work

Record the data of the research

Common analysis and extraction of conclusions

Skills implemented

Entrepreneurship skills, leadership skills, as well as to share ideas and understanding and management processes, teamwork, search and selection of information, critical thinking, presentation of information ...

Teacher's notes: It includes the resources that are used, the division of tasks among the students, the vocabulary they must work, ...

Student file: to serve as a guide on what teacher wants students to learn

Rubric: The student did self-assess the basic competences such as: Linguistic competence, mathematical competence, entrepreneurial initiative; digital competence and basic competences in science and technology, social and civic competences, learning to learn...

Evaluation

Documentation pages

Students are asked to prepare documents summarizing the work done. To have a complete report, it is imperative that students:

• Document their work with different types of media

• Document each stage of the process

• Organize and finalize their documents

Teachers help the students:

• Providing information and giving them time to see where and how and improve parts of their document.

• Allow students to share their documents with each others. By communicating their findings, students participate in the work they develop as scientists and collaborate in the learning and training of other students.

Observation sheets: the teachers records any type of observation that they consider relevant for each student. The teacher provides information to students about their learning process.

Evaluation of the final product is done collaboratively. A group of students evaluates the work of other group, the evaluation team justifies its decision about the mark and anyone in the class can express their opinion. Here is an example of the debate.

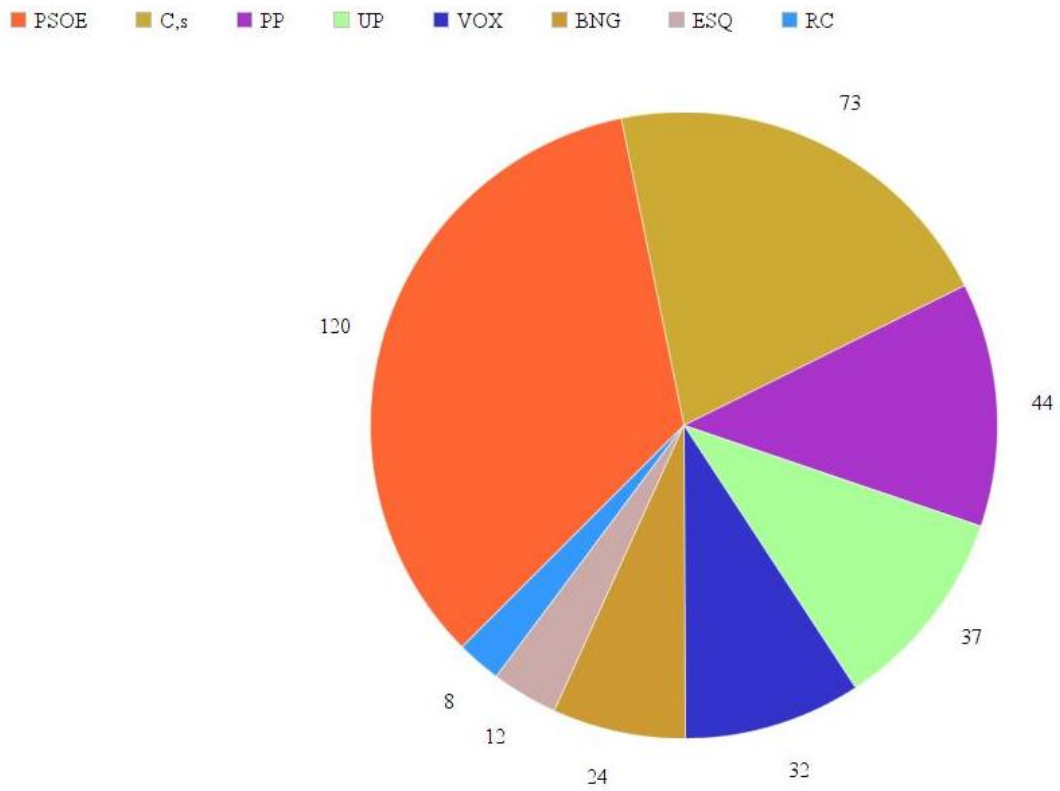
https://www.youtube.com/watch?v=84H9fmwI9y8&feature=youtu.be

Elections to the European Parliament and the Spanish parliament

This year 2019 there have been elections in Europe and also in Spain (more than 1) , we also want to prepare our students to be European citizens. To do so, Election has been organized at Spanish school, students had the opprtunity to vote the memebers of Parliaments in Spain and we followed up on the European elections. This were the results

Students role play all election process, caculated the results with the help of this page

Votaciones https://icon.cat/util/elecciones/VGxMzYeldo



This was the electitions call

National Elections at C.P.I O Cruce

- Only Secondary students and school staff can vote

-The elections will be held in the main Hall area.

-There will be null votes if you vote for a party that does not

present at the elections, ... and others decided by the **Electoral Board**

-The blank votes will be those that do not reflect any candidacy.

-The voting day will be on April 24, 2019.

-Delegated vote is not allowed and nor vote by mail,

You can only vote in person.

We also worked about

The European Parliament and its institutions

The European Parliament its powers and roles

European Parliament Democracy and Liberty

Structure of the European Parliament

The venues of the European Parliament

Best Practices

“Engaging students in the learning process through innovation”

(ESTI)

2017-1-ES01-KA219-037963

1. Activity description form

Title:	Designing for our 3D Printer
Proposing teacher(s)	María Pazos / Milagros Trigo/Ana Sogo
Country	Spain
Language	English
Target group	Secondary students and high school
Topic(s) addressed	Art, Technology, projects
Motivation to produce this activity	The Galician Governement sent a 3D printer to our school and teachers at school tried to get to know how to design different objects.
Type of activity:	Art activity, but also entrepreneurial activities

Description of the process and teaching/ learning strategies used *(what, how, in which order)*	First we used Tinkercad and Cura to design different objects, and personal objects like names to put in the room Students learnt to produce 3d objects with STL format and then with the CURA they changed the file on GDcode. In 2018-19 we learnt to desing objects with BLENDER, it's a proffesional and quite dificult program, we only worked the disign part. Students were very interested in the programe, they did all type of objects. In the 2nd trining in Pagany 6 students in pairs trained 3 classes. Students training
Short description of the content	The programme helps students to design all type of objects, and become experts in doing any object they like. They did wit games, jewelry objects...
Methodology	Learning by doing, the teacher is the guide and discovers new ways of using the programme together with students.
Key competences implemented	ICT competences, aprender a aprender, Sense of initiative and entrepreneurial spirit; Awareness and cultural and art expressions.
Transversal skills worked	Critical thinking; decision making, teamwork comunication through Art,...
Resources needed (software, hardware, other tools...)	Free programmes: Tinkercad/ Blender and Cura Filament for 3D printing
Related materials (links, pdf, etc. if any)	Students did some works for the Town Hall of Cerceda , also for their rooms and objects for the mothers day Students also create objects for home
Time required (hours / months / per week, etc.)	To create an object we need about a sesion 50m, students can finish it at home and they are so motivated that they always do it
Further information	See some works

2. Activity description form

Title:	A real company in our school
Proposing teacher(s)	Milagros Trigo Miranda; María Pazos
Country	Spain
Language	English/Spanish
Target group	Students year 2 secondary
Topic(s) addressed	Entrepreneurship
Motivation to produce this activity	To train participating students in the principles and values of cooperativism, as well as in the value of entrepreneurship through the figures of the social economy as a way to generate wealth based on local reality and for their future academic and professional development, contributing to overcome reluctance to start up business initiatives and laying the foundations of their knowledge on the subject. Value the importance of the social component of cooperativization Equip students with basic and transverse skills such as entrepreneurship, cooperation, interaction through ICT media, creativity, communication, learning to learn...
Type of activity:	A multidisciplinary project
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	Students choose a collaborative business model that we can frame within the social entrepreneurship and the work methodologies required to successfully develop the overcome the reluctance to start entrepreneurial initiatives which allows students to acquire knowledge and skills from real work. How can students get money to visit a technological company and at the same time, allocate 20% of the income to a social action. Example collaborate with an NGO.

	The students decided that their company was going to dedicate themselves to the design and marketing of 3D objects. Following the business approach given the activities, a cooperative was set up following all the required procedures (opening a bank account with a deposit of social capital contributed by the participating persons, defining and signing statutes before a notary, opening a bank account ...), agreed in the general assembly the organizational structure of the company. The assignment of tasks for each one of the elected positions can be consulted in the statutes of the cooperative. The most outstanding positions are: President, Manager, design department, commercial department, purchasing department, production department. Activities and responsibilities were clearly assigned, as well as the coordination requirements between the different departments, which in each case had a responsible person (director or director) who acted as interlocutor at the same time. Students were responsible for voting by a multilateral cooperative assembly, and for assigning people to different real estate departments according to the estimated personnel needs for each of the areas, as well as to the capacity and interests of the participants. This activity was carried out with the collaboration of "Asociación de empresarios de Sabón" (association of entrepreneurs of Sabón- A Coruña) Tasks developped: Design and prototyping activities; Produción, Commercial and publicity action, ... Products to be sold: objects like: ingenious games, robotics, ... and any object that a persone likes to have.
Short description of the content	Students acquiere entreprenurial competences, and all realted on how an entreprise works. Students also - Understand the basic rules of business operation and involve themselves in active business, working in a coordinated team.

	- Students learn to produce 3D objects using Tinkerkad and Cura and also how to use the 3D printer. - Perceive entrepreneurship as a positive activity and possible path for future professional development.. - Understand the interest and potential of the figure of cooperativism and the social economy for their surroundings and territory.. - Understand the concept of economic benefit (as a difference between the income achieved and the expenses generated) and achieve a positive result that allows them to apply the benefits to a common interest.
Methodology	Learning by doing, collaborative work.
Key competences implemented	Entrepreneurship, communication, competences in ICT
Transversal skills worked	Teamwork, learning to learn, decision making, problem solving... ; How to manage a company etc
Resources needed (software, hardware, other tools...)	3D materials, Tinkercad, Blender Cura, 3D printer filament...
Related materials (links, pdf, etc. if any)	3D printer Canvas platform to manage the company
Time required (hours)	3 months 1 hour at week
urther information	https://www.facebook.com/cpiocruce/photos/pcb. 1574751355989114/1574746619322921/?type=3&theater Studens gave the 20% of the colected money to " Cruz Roja" https://www.facebook.com/cpiocruce/photos/pcb. 1563106350486948/1563103770487206/?type=3&theater With the mononey the collected they visited two technology companies CESGA and Women entrepreneurship set up by the University of Santiago.

"Engaging students in the learning process through innovation"

(ESTI)

2017-1-ES01-KA219-037963

1. Activity description form

Title:	Methods for separating mixtures: practical applications
Proposing teacher(s)	Raquel Veira Díaz
Country	Spain
Language	Spanish
Target group	2º ESO
Topic(s) addressed	Physics and Chemistry - "Diversity of matter"
Motivation to produce this activity	We have to study methods for separating mixtures, but we want to do it with a very **practical approach** in which the **students assume de leading role**. Keep in mind that our students study physics and chemistry for the first time, a practical approach is **motivating** and awakens in them a greater **interest** in learning the subject.
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	- Brief theoretical **introduction** to the methods for separation of mixtures with explanation of the **teacher** in the ordinary classroom. - **Presentation** of the virtual laboratory in the ordinary classroom. - **Training** of students with the activities of the **virtual laboratory** in the computer room. - Realization of real **practices** of separation of mixtures organizing the physics laboratory in **work stations**, one for each method. - Preparation of **laboratory reports** with **ICT** following the general scheme and answering the questions raised in the script of the practices. - Evaluation with record of direct observation and with a rubric for the laboratory report

Short description of the content	- We study the **concept of mixture** of substances and classification into **homogeneous and heterogeneous**. - We analyze the different methods of separation of mixtures: **decantation, filtration, chromatography, magnetic separation, crystallization and distillation**, to see which is more appropriate in each case. - We practice the way to apply each method and the **laboratory instruments** that are used in each one. - We reflect on the method and **results** and write the conclusions in a **report**.
Methodology	We apply an eminently **practical** methodology and that has as starting point the ***learning based on challenges***. The challenge is to separate a series of mixtures and for this the students have to **learn** some concepts and **train** in the virtual laboratory before taking **action**.
Key competences implemented	CCL, CMCCT, CD, CAA, CSC, CSIEE and CCEC * (CCL, competence in linguistic communication; CMCCT, mathematical competence and basic competences in science and technology; CD, digital competence; CAA, learn to learn; CSC, social and civic competences; CSIEE, sense of initiative and entrepreneurship and CCEC, awareness and cultural expressions)
Transversal skills worked	CL, EOE, CA, TIC, EMP, ECC and PV-I * (CL, Reading Comprehension; EOE, oral and written expression, CA, audiovisual communication, TIC, information and communication technologies, EMP, entrepreneurship, ECC, civic and constitutional education; PV-I, Prevention of violence - Equality)
Resources needed (software, hardware, other tools...)	- Computers with internet connection - Physics and chemistry laboratory with the usual equipment
Related materials (links, pdf, etc. if any)	Laboratory script: https://docs.google.com/document/d/e/2PACX-1vRvALNiMLNh2Ls7tR0AvqTwhYjJa0lzWOPAQAt1DpNYH9qZxIY_weNxst2jkryNu9xGbQLsgD5l1ern/pub Link to virtual laboratory: http://odas.educarchile.cl/objetos_digitales/odas_ciencias/22_jugando_separar/LearningObject/index.html Evaluation instruments: https://docs.google.com/document/d/e/2PACX-1vRoEOSju267fgF7oT6Nf8lxHtR9z7GiHfLez7webWMPoQEjX5jPWCTdpG42MlE1y5i2Xdm7YqSpkcAD/pub
Time required (hours / months / per week, etc.)	6 hours (2 weeks)
Further information	http://www.proyectoscpiocruce.com/engaging/raquel/2separationmixtures.pdf

“Engaging students in the learning process through innovation” (ESTI)

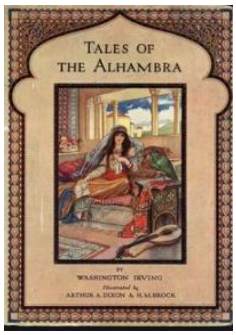
2017-1-ES01-KA219-037963

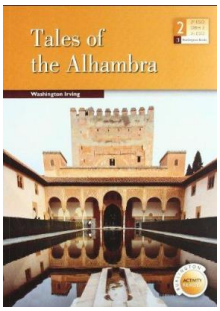
1. Activity description form

Title:	Simmetry
Proposing teacher(s)	Milagros Trigo Miranda
Country	Spain
Language	English/Spanish
Target group	Students year 2 secondary
Topic(s) addressed	Studing and working with symmetry
Motivation to produce this activity	With the activity students are expected to observe the images, identify the symmetries and verbalize their characteristics. The teacher uses one of the tales of Wasington Irving to talk about the monument (Alhambra) and then presents the different buildings and gardens and what they were used for. In this way students get familiar with the Alambra and its history . After they analize type of symmenty we can find in tha Alambra which according to Marcus du Sautoy (Londres, 1965 "¡(Is the palace of the simmetry!" "*The Alhambra is a microcosm of the whole problem of symmetry,"* *"Symmetry is a concept that supports many things: in biology, for example, the H1N1 virus is a symmetric object and uses symmetry to replicate itself, in physics it serves to understand the behavior of elementary particles."* Laces, such as those found in the Alhambra in Granada are Arab mosaics whose motifs contain intertwined ribbons. Its beauty lies in the symmetry hidden in its mosaics

	The teacher will use the Alambra history and art to engage students in learning Symmentry. They'll get to know all about : Axial symmetry Central symmetry and will be able to create their own Art works We´'ll propose studemts to do an APP about the Alahambra, so students we'll get knowledge about the history and Art of the monument.
Type of activity:	Interisciplinary project
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	In this activity students are expected to collectively observe the images, identify the symmetries and verbalize their characteristics, so that they can discover that the symmetry is in their environment, and establish some general ideas about it. In this way it is expected to raise the level of prior knowledge that students have in this regard. We focus the activity from a playful way, to encourage participation, and motivate and guide students, so that students can identify and recognize the essential features of symmetrical forms. If the students do not recognize or have problems with the description some symmetrical forms, the teacher helps them identify them by asking the pertinent questions. It does not matter as much to get correct answers as to remember key concepts, to motivate the students and to generate that they expose diverse opinions, justify their answers and try to solve problems using their own methods. The teacher presents a sequence of activities that allows to identify symmetrical and asymmetric images, draw symmetrical axes and find symmetrical halves in different objects. The teacher must use the appropriate language to introduce the concepts of symmetry, symmetric axis, among others. After the students have observed and discovered symmetrical forms, they should read together with them the objective of the class, and invite them to continue with the activities, and to know more about this topic, we will use the Alahambra of Granada. The teacher introduces the Alahambra of Granada and the writer washinton Irving.

	Students get familiar with the Art and History of the Alahambra by reading one or more of the washinton Irving tales. The teacher introduces the monument using the white board From tales teachers and students work all about the Alahambra History and Art Students learn about simmetry and how to apply it to the art and they produce their own art works The final prduct will be ask students to apply simmetry to a real task. Students will present their activity to the class.
Short description of the content	Students get familiar with simmetry and their application to real task. At the same time students get knowledge about a monument (The alahambra) in which simmetry plays an important role and also about the story round the monument through washinton Irving tales. Students are asked to apply simmetry to a real task.
Methodology	Learning by doing, working in pairs, and collaborative solving problem.
Key competences implemented	Art, communication, competences in ICT...
Transversal skills worked	Teamwork, learning to learn, problem solving...
Resources needed (software, hardware, other tools...)	mobile/iPad, computer, tools to make the presentation...
Related materials (links, pdf, etc. if any)	https://mahara.ats2020.eu/view/view.php?id=16893
Time required (hours / months / per week, etc.)	4 clases of 50’
Further information	Portfolio can be used for any subject/project https://mahara.ats2020.eu/view/view.php?id=15037

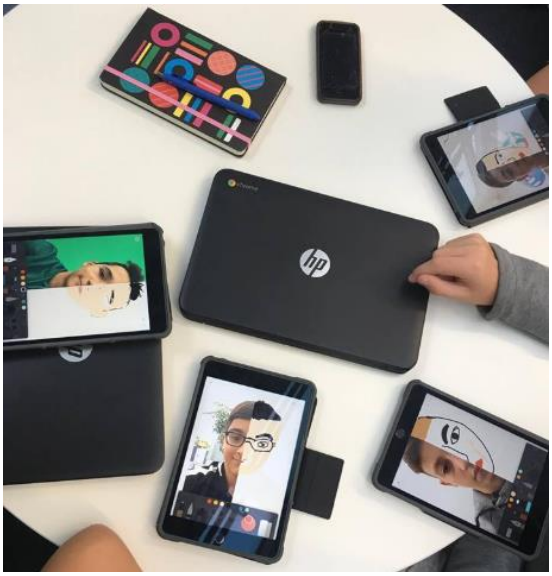




The teacher explains the axial simmetry and central symmetry

Students produce an App about the Alahambra

Students work on symmetry with paper



“Engaging students in the learning process through innovation”

(ESTI)

2017-1-ES01-KA219-037963

1. Activity description form

Title:	“Timeline: 150 years of periodic table and games”
Proposing teacher(s)	Raquel Veira Díaz
Country	Spain
Language	Spanish
Target group	3º ESO
Topic(s) addressed	Physics and Chemistry - “Periodic Table”
Motivation to produce this activity	We had to study the **periodic table**, but this year is its **150th anniversary** and we wanted to do something special. We decided to **investigate** it more thoroughly than indicated in the textbook and present it in a more **attractive and fun** way.
Type of activity:	Search for information and development of a creative project.
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	- Brief introduction to the history of the periodic table from the time of Mendeléyev viewing videos on **Youtube**. - Presentation of the **official website** of the international year of the periodic table # IYPT2019. - **Search of information** on the periodic table by the students in the textbook and on the **internet**. - Planning, design and manufacture of the **project's products** (timelines and games of the periodic table). - **Exposition** of the works in the classroom and/or in the lobby of the center. - **Evaluation** with record of direct observation and with a rubric for the product of the project.
Short description of the content	- We study the **periodic table**. Concepts such as group and period, the chemical elements that are part of it and its arrangement.

	- We **investigate the history** of the periodic table since Mendeléyev's proposal. - We develop skills of **teamwork** and project development. - We **communicate** the results with an exhibition.
Methodology	We apply an eminently practical methodology and that has as starting point the ***project-based learning.*** **Collaborative work teams** with distributed **roles**, **planning** and product **manufacturing** step by step.
Key competences implemented	CCL, CMCCT, CD, CAA, CSC, CSIEE and CCEC * (CCL, competence in linguistic communication; CMCCT, mathematical competence and basic competences in science and technology; CD, digital competence; CAA, learn to learn; CSC, social and civic competences; CSIEE, sense of initiative and entrepreneurship and CCEC, awareness and cultural expressions)
Transversal skills worked	CL, EOE, CA, TIC, EMP, ECC and PV-I * (CL, Reading Comprehension; EOE, oral and written expression, CA, audiovisual communication, TIC, information and communication technologies, EMP, entrepreneurship, ECC, civic and constitutional education; PV-I, Prevention of violence - Equality)
Resources needed (software, hardware, other tools...)	- Computers with internet connection - Paper, recycled cardboard, markers, EVA foam ...
Related materials (links, pdf, etc. if any)	- Introduction links: https://www.youtube.com/watch?v=7kCCWWtCrpA https://www.youtube.com/watch?v=mrEcEDlZ7Rc https://www.iypt2019.org/ - Planning form: https://docs.google.com/document/d/e/2PACX-1vQEC4JxEZ9k4uGvCIpQgwsTizyUjN90ZGE1fFA0CeOSP7xAmwnG7oe2Yoec7q5EiO0eYGg_r6EwvDv2/pub - Evaluation instruments: https://docs.google.com/document/d/e/2PACX-1vRw6ZpClVM--RNIP1HRFdNACidRxaZM55MSbGGuLfRjYs6zdD6Gt3NsVV3ucFrPOCZ2ZElSXu3E5blJ/pub
Time required (hours	6 hours (2 weeks)
Reference URL/s (if availiable	http://www.proyectoscpiocruce.com/engaging/raquel/3tablperiodica.pdf

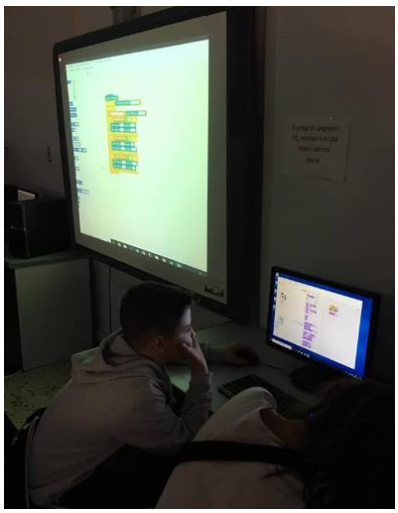
"Engaging students in the learning process through innovation" (ESTI)
2017-1-ES01-KA219-037963

1. Activity description form

Title:	**Introduction to Physics with Mbot**
Proposing teacher(s)	Serafina Chirico
Country	Italy
Language	English/Italian
Target group	Students third year of Low Secondary School
Topic(s) addressed	Learning physics and geometry programming a robot

Motivation to produce this activity	Through this activity students will learn the space , speed and time concepts. The teacher is going to show Mblock software, introducing the logic block programming, bringing the students through next steps , to achieve a script that will allow them to study the uniform rectilinear motion of a body.
Type of activity:	Interdisciplinary project
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	The teacher will introduce speed concepts, uniform rectilinear motion and calculation formula. The teacher will show MBOT robot, explaining the different usage of the components. The teacher will introduce the students to a logic block programming through MBLOCK. Once the students have learnt the programming basic concepts , they will try to make a script that will allow the robot to move , making it walk longer routes. For each step the students will have to sure that the chronometer measures the time during the route. Students will perform measurements at a different speeds and at the end they will create, using a calculation sheet , a space -time graph. Regarding this graph the students will be invited to reflect and make considerations on the results obtained. The real aim of the programming is to encourage and guide the students to discover the physics and to spot and to understand relations among the variables. The teacher will introduce these speed concepts by using an appropriate language according to the students age . The students will get used to using with the graphic representation methods with the use of calculation sheets. They will performe their knowledge in the relative classrooms. They will show what they have learnt with a short presentation.

Short description of the content	Learners will gain confidence with these basic physics, speed , space, time concepts as well as with graphic representation methods through the use of calculation sheets.
Methodology	Learning by doing, working in pairs, and collaborative solving problem.
Key competences implemented	Math, robotics, competences in ICT;
Transversal skills worked	Teamwork, learning to learn, problem solving...
Resources needed (software, hardware, other tools...)	PC/iPad, computer, tools to make the presentation...
Related materials (links, pdf, etc. if any)	http://www.mblock.cc/?noredirect=en_US
Time required (hours / months / per week, etc.)	4/6 lessons 2 hours (a week)
Further information	https://www.scuolacriscuolopagani.edu.it/wp-content/uploads/2019/07/Mblock.pdf



“Engaging students in the learning process through innovation” (ESTI)

2017-1-ES01-KA219-037963

1. Activity description form

Title:	Apple tree in Pagani
Proposing teacher(s)	Marina Scibelli
Country	Italy
Language	English/Italian
Target group	Students third year of Low Secondary School
Topic(s) addressed	Learning on scientific dependence between climatic changes factors and periodic phenomena in lively nature, such as germination, flowering and fruiting.
Learning objectives/competences	To communicate in a confident way this topics in different contexts. To produce different type of texts such as mind maps, grids, graphics and digital works. To get knowledge the main aspects of scientific investigation and understand the impact of Science and Technology on the enviroment. To find connections and relations, to gain and interpret the information . To raise the students' awareness of their role in the cognitive process undertaken, developing their critical and rational attitude towards reality and its phenomena. To deepen the students' relationship with each other, engaging them to cooperation , to research and to creation work through different strategies.

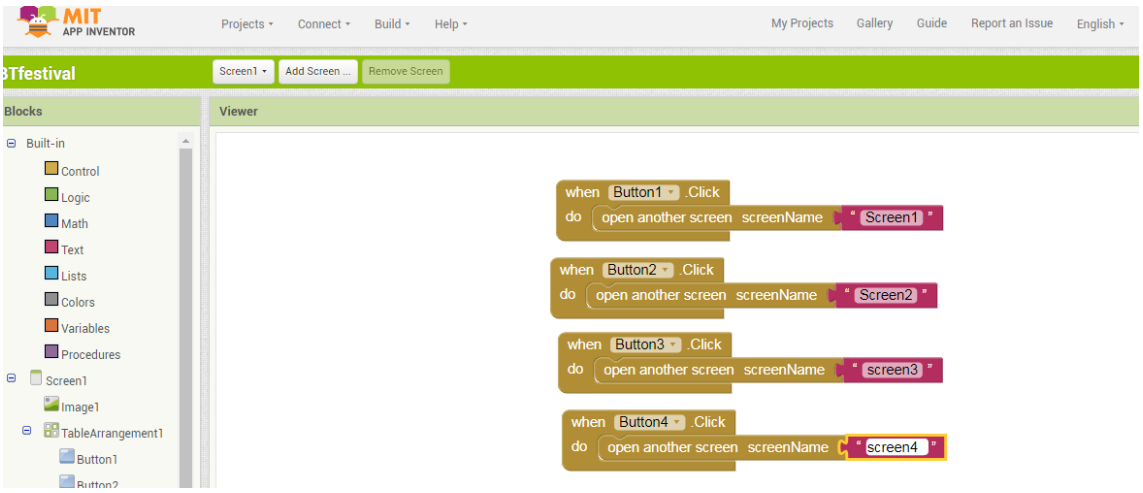
	Using and producing multimedia texts.
Type of activity:	Interdisciplinary project
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	The activity will start by presentation of the area involved and observation of the subject. The students will be divided into cooperative groups with different tasks and roles. Each group will research some information on the apple tree and then they will share and compare the results among themselves. A photographic report will be done: every week some photos will be taken on the growth of the apple tree through the app Phenologit , to compare it with the ones of the other countries. Final feedback with comparison , discussion and conclusion on the work finished. Production of a PPT or another digital work.
Short description of the content	The students will understand the climatic factors, soil composition, sun exposition, natural phenomena through a personal and significant experience.
Methodology	Learning by doing, working in pairs, and collaborative solving problem.
Key competences implemented	Math, robotics, competences in ICT;
Transversal skills worked	Teamwork, learning to learn, problem solving...
Resources needed (software, hardware, other tools...)	PC/iPad, computer, tools to make the presentation...
Related materials	http://www.mblock.cc/?noredirect=en_US
Time required	4/6 lessons 2 hours (one week)
Further information	https://www.scuolacriscuolopagani.edu.it/wp-content/uploads/2019/07/PhenoloGit.pdf

The apple tree we we have planted to do the study of phenology

“Engaging students in the learning process through innovation” (ESTI)

2017-1-ES01-KA219-037963

1.Activity description form



Title:	Madonna delle Galline: our traditional feast showing with App Inventor
Proposing teacher(s)	Serafina Chirico
Country	Italy
Language	English/Italian
Target group	Students third year of Low Secondary School
Topic(s) addressed	Learning an sharing cultural and historical traditions of their town using STEAM
Motivation to produce this activity	Through this activity students learnt and share traditions and costumes of their town.

	The teacher is going to introduce apps on ANDROID mobiles. In particular teacher will introduce APP INVENTOR 2 software.
Type of activity:	Interdisciplinary project
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	The teacher will explain how to install emulator on their mobile phones. The teacher will introduce students to User Interface Components - App Inventor for Android. Once the students have learnt the programming basic concepts , they will try to make aa APP illustrating the main feature con the Madonna delle Galline feast. They will performe their knowledge in the relative classrooms. They will show what they have learnt with a short presentation.
Short description of the content	Learners will gain confidence with tradition and history of their town, using a different approach.
Methodology	Learning by doing, working in pairs, and collaborative solving problem.
Key competences implemented	History, , competences in ICT;
Transversal skills worked	Teamwork, learning to learn, problem solving...
Resources needed (software, hardware, other tools...)	PC/iPad, mobile phones, tools to make the presentation...
Related materials (links, pdf, etc. if any)	https://drive.google.com/open?id=1AFJehEeUK9bDRAsiebzty-TmQOwH6GB-
Time required	4/6 lessons 2 hours (a week)
Further information	Download the app to your computer from our section Apps

"**"Engaging students in the learning process through innovation"**

2017-1-ES01-KA219-037963

Lesson plan / Activity description form

Title	**Eyes on shopping - it means statistics in everyday life.**
Proposing teacher(s)	Hanna Bialik
Country	Poland
Language	Polish/ English
Target group	Students of lower secondary school
Topic(s) addressed	Application of selected statistical elements in design work
Learning objectives/competences	**Knowledge**
	- the student will know how to collect data for statistical surveys
	- the student will know the concept of arithmetic mean, weighted average, median, dominant
	- the student will know what programs he can use to make simple statistical calculations
	-the student will know how to create different types of graphs in the selected program (pie, bar, band, spot)
	Skills
	-the student will be able to use the spreadsheet for statistical calculations

	- the student will be able to use selected elements of the statistics to present the collected results of the conducted surveys
	-the student will be able to create a multimedia presentation using various types of charts
	- the student will be able to create a mathematical quiz on the basis of the collected results
Descriptions of the proces and teaching / learning strategies used	1. **Preparatory phase**
	2. Organizational activities
	- checking attendance, entering eg, giving the topic of the lesson, purpose of the lesson).
	3. **Realization phase**
	- presentation of the multimedia presentation "Eyes on shopping" by a group of students
	- teacher's talk (based on the viewer's presentation) what is the statistics and what it is for
	-reminding of the concept of the arithmetic mean and the weighted average - an indication of the elementary examples of application in the student's life
	- a mini lecture on medians, dominants
	- reminding of the spreadsheet's possibilities, the use of the creation of various types of charts (point, band, bar, column, pie) -pointing to differences, paying attention to the legibility of the presented data
	- reminding of the possibilities of programs for creating multimedia presentations and drawing attention to the fact that the latest versions offer a lot of possibilities for presenting the results in an interesting way
	4. **evaluation**

	A quiz that uses the information learned in the field of statistics and the presented multimedia presentation
Methodology	- talk, group work, discussion, use of the Internet
Key competences	-communication in mother tongue and in English - the ability to read and interpret written instructions (including the language of mathematics) - correctness and legibility of the record in accordance with the symbolism used in the language of mathematics the use of mathematical thinking in practical situations -learning to learn - ability to work in a group -time management skills - using modern techniques in learning (games, Internet
Resources needed	chalk, blackboard, ruler, setsquare, computer, multimedia projector and interactive quiz regarding presented presentations, mobile phones with Internet connection
Materials	- Matematyka 2001 – handbook for lower secondary school students - Excel - Power Point - www.quizzy.in, www.kahoot.it
Time required (hours/months/per week, etc)	50m
Further information	**http://www.proyectoscpiocruce.com/engaging/material/shopping%20awareness.pdf**

“**“Engaging students in the learning process through innovation”**

2017-1-ES01-KA219-037963

Lesson plan / Activity description form

Title	**Phenological diversity of selected tree species.**
Proposing teacher	Beata Staczewska
Country	Poland
Language	Polish/English
Target Group	Students of second year of secondary school
Topic(s) addressed	Learning about plants and phenomena related to them
Learning objectives/ competences	**a) Knowledge** Learner: - the student knows the meaning of the concept of phenology, foliage, flowering and fruiting - can list of selected tree species - is aware of changes in plants related to phenology **b) Skills** Learner: - can recognize selected plant species using prepared schemes - can estimate the phenological stage of a plant - marks the analyzed values in the worksheed - observes phenomena occurring in nature

Description of the process and teaching/learning strategies used (what, how, in which order)	**a) Preparatory phase** Classes are held in a school garden or park. The season is optional. You can conduct classes in winter and summer to compare the observations carried out. Organizational activities 1. The teacher introduces topic of the lesson and tells about lesson objectives. 2. Class division into groups. 3. Assignment of tasks in groups. **b) Realization phase** 1. The teacher introduces term "phenological seasons" and tells students how phenological seasons depend on weather conditions. 2. The teacher presents worksheets and explain what to do / how to fill them. 3. The students read worksheets and learn about selected tree species features. 4. The students make weather and trees observations. 5. The students make posters presenting four selected species of trees in relation to the current season. They discuss about features of the trees and evaluate phenological stages of the trees. 6. The teams leaders present posters, talk about features of the trees and their phenological stages. **c) Summative phase** 1. The teacher asks control questions about changes in plants related to phenology to consolidate the material being taught. 2. Students assess their own way of learning.
Methodology	talk, team work, discussion, learning by doing, observation, collaborative solving problem,

Key competences implemented	-effective communication -organizing teamwork -cooperation in a team -using instructions and source material providing information -problem solving in a creative way -assessing one's own learning
Transversal skills worked	teamwork, problem solving
Resources needed (software, hardware, other tools)	worksheets, thermometers for measuring air temperature, pencils, markers, paper sheets
Related materials (links,pdf,etc. if any)	Attachements : worksheets for learners and written work instruction
Time required (hours / months /per week, etc.)	2 lessons / 2 hours
Further information	See collaborative project

WORK INSTRUCTION :

Phenologically, the seasons are determined on the basis of nature observations and weather conditions. Each plant species adapts to changing conditions and undergoes an annual development cycle.

1. Observe the construction of four tree species.

2. Observe today's weather conditions.

3. On the basis of these observations, guess the species of these trees and determine their phenological phase/ stage.

4. Make posters presenting four selected species of trees in relation to the current season.

WORKSHEET NUMBER 1

Date of the lesson:.....

Group members:

.....

Characterize today's weather and complete the chart.

You can use such terms as: very sunny, windy, rainy, cloudy, dry air, snow, no wind, strong wind etc.

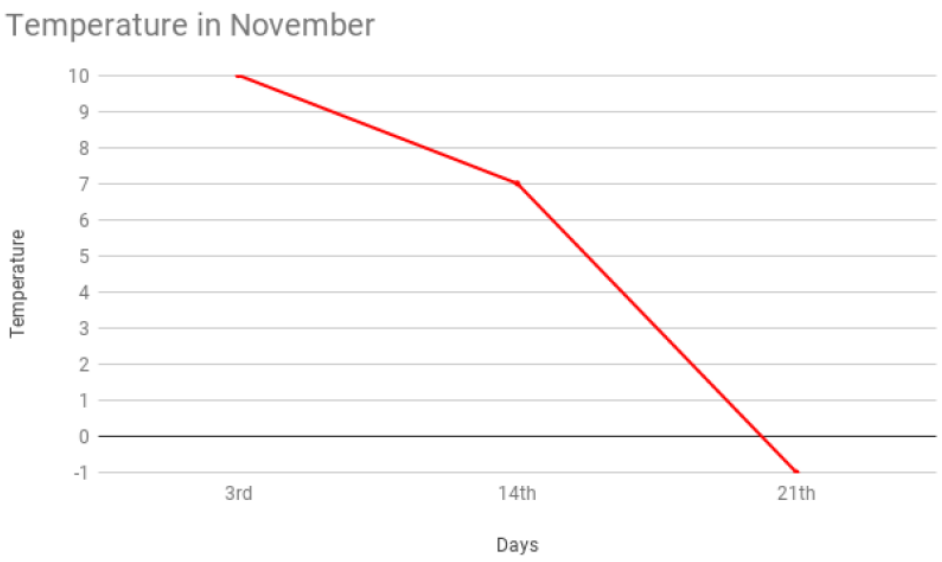
Weather components	**Estimate :**
air temperature	
sun operation	
clouds	
the wind strenght	
air humidity	

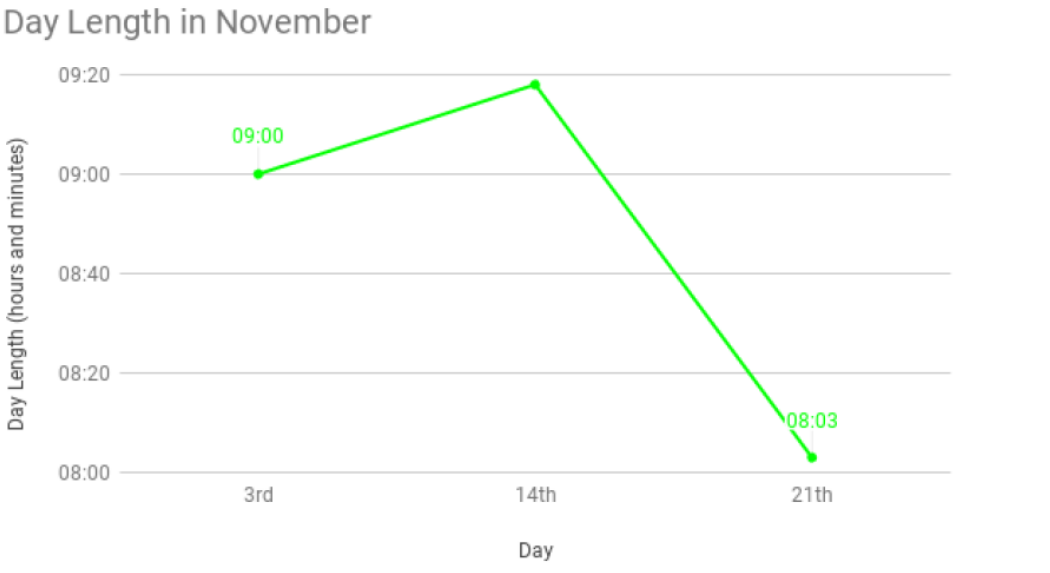
WORKSHEET NUMBER 2

Fill in the chart using your own observation and the attachement.

Nr	the plant species name	flowers (their colour, lack of blooming etc.)	leaf shape	features of buds on a twig/branch	leaf shape, innervation	fruit (colour), lack of fruit
1.						

2.						
3.						
4.						


Temperature in November
10
9
8
7
6
5
4
3
2
1
0
-1
Temperature
3rd
14th
21th
Days


Day Length in November
09:20
09:00
08:40
08:20
08:00
Day Length (hours and minutes)
09:00
08:03
3rd
14th
21th
Day

"**"Engaging students in the learning process through innovation"**

2017-1-ES01-KA219-037963

Lesson plan / Activity description form

Title	Volcanism
Proposing teacher(s)	Anna Gliga
Country	Poland
Language	Polish / English
Target Group	Students of second year of secondary school
Topic(s) addressed	Learning about volcanoes and phenomena related to them.
Learning objectives / competences	**a) Knowledge** Learner: 1. knows what is volcanism and what are the essential conditions in which a volcano is created, 2. knows terms such as: magma, lava, eruption, crater, 3. knows kinds of lava, 4. knows kinds of volcanoes, 5. knows different kinds of products of volcanic eruption, 6. knows the effects of volcanic eruption. **b) Skills** Learner: 1. can draw conical section and cross-section of the volcano, 2. can draw section of active volcano and describe its structure, 3. can indicate the area where volcanoes are located so-called Pacific Ring of Fire, 4. can list and show on the map at least three volcanoes on every continent
Description of the process and teaching/ learning strategies used (what, how, in which order)	**a) Preparatory phase** Organizational activities 1.The teacher refers to information and skills from the previous lesson. Students' engagement is rewarded with tokens. The teacher introduces topic of the lesson and tells about lesson objectives. **b) Realization phase** 1.The teacher introduces students to volcanic phenomena and explains terms such as: magma, lava, eruption. 2.The teacher discusses lava classification: runny (alkaline) and thick (acidic). The teacher discusses their composition, how fast they relocate and draws on the whiteboard two diagrams of two kinds of volcano cones: conical and cross-section created by lavas mentioned above. 3.The teacher tells students how volcanoes function using Quiver App. Students divide themselves into groups and color volcanoes on their worksheets (attachment number 1) (Thanks to extended reality

	volcano model will turn into 3-D object which not only has colors corresponding to colored pencils used by students but also can move-animate) Students, using app in their smart phones, watch eruption of their volcanoes. 4.The teacher asks students to name products of volcanic eruption which they watch. Students recognize them, typing their names in their smart phones. Program checks if the answers are correct. 5.To organize information the teacher tells the students how can volcanoes can be divided taking into account kinds of products of volcanic eruption: effusive volcanoes, explosive volcanoes, stratovolcanoes. 6. The teacher discusses places on Earth where volcanoes are located. Most of them is devoted to Pacific Ring of Fire – the teacher characterizes it, explains where the name of it comes from and what phenomena, under the surface of the ground, take place there. The teacher shows students this area on the map. 7.The teacher tells students how many active volcanoes are on the Earth now, lists and shows on the map the most popular European volcanoes. 8. The teacher tells about examples of several huge volcanic disasters.
Methodology	Class work, individual work, team work, pair work, discussion
Key competences implemented	Geography, competences of ICT
Transversal skills worked	Decision making, communication, ...
Resources needed (software, hardware, other tools…)	physical map of the world, physical map of Europe, geography textbook, Smartphone with the access to the Internet, Quiver App – 3-D colouring App
Related materials (links, pdf, etc. if any)	Bibliography: 1. Cichoszewski Kazimierz, Karaś Anna, Grząba Ewa, 2015, Oblicza geografii 1. Maturalne Karty Pracy. Zakres rozszerzony. Szkoła ponadgimnazjalna. 2. Malarz Roman, Więckowski Marek, 2015, Oblicza geografii 1. Podręcznik. Zakres rozszerzony. Szkoła ponadgimnazjalna. Attachements: worksheets for learners
Time required (hours / months / per week, etc.)	1 lesson / 1 hour

“Engaging students in the learning process through innovation” (ESTI)

2017-1-ES01-KA219-037963

1. Activity description form

FOOD HABITS COMPARED

Title:	FOOD HABITS COMPARED
Proposing teacher(s)	Giovanna Civale
Country	Italy
Language	English/Italian
Target group	Students third year of Low Secondary School
Topic(s) addressed	Observation of the food habits of partner countries

Learning objectives/ competences	• Knowing and comparing the food habits of the students of the various partner countries • Educating to a healthy and sustainable food consumption • Acquiring awareness of the importance of a healthy and correct diet associated with adequate physical activity • Using and producing multimedia texts.
Type of activity:	Interdisciplinary project : Survey carried out on the alimentary habits of the students of the four partner countries through a questionnaire appropriately elaborated, administered and then analyzed
Description of the process and teaching/ learning strategies used *(what, how, in which order)*	• Draw up a questionnaire on food habits with 15 questions • Preparation of a format for filling the questionnaire with use of google drive • Collection of data relating to the investigation carried out • Graphic processing • Interpretation of results • Production of a PPT or another digital work. • Final feedback with comparison, discussion and conclusion on the finished work. • Final check through a game / quiz (Kaoot)
Short description of the content	Valorisation of good practices to promote healthy and correct nutrition
Methodology	Learning by doing, working in pairs, and collaborative solving problem. The survey has been proposed to 4 European Countries to a sample formed by: - *43 Italian students;* - *43 Polish students;* - *30 Spanish students;* - *27 Romanian students.*
Key competences implemented	Math,, competences in ICT;

Transversal skills worked	Teamwork, learning to learn, problem solving...
Resources needed (software, hardware, other tools...)	PC/iPad, computer, tools to make the presentation...
Related materials (links, pdf, etc. if any)	PdF https://www.scuolacriscuolopagani.edu.it/wp-content/uploads/2019/07/ERASMUS-FOOD-HABITS.pdf
Time required (hours / months / per week, etc.)	5 lessons 2 hours
Further information	https://www.scuolacriscuolopagani.edu.it/wp-content/uploads/2019/07/ERASMUS-FOOD-HABITS.pdf

Survey on food habits

Number of students _____ *Present*_____ *Absent*_____

- **How often does your family have these meals?**

	Always	Sometimes	Never
Breakfast			
lunch			
dinner			

- **Do you have breakfast?**

Every day	
Four-six times a week	
Twice -three times a week	
Once a week	
Never or rarely	

3. **If you don't have breakfast what is the reason?**

There is no time	
When I wake up I'm not hungry	
I just need a mid-morning snack	
Anything else	

4 **. What kind of food do you usually have for breakfast?**

food	always	never
milk		
Yogurt		
Tea		
Fruit juice		
Freshly-squeezed juice		
Biscuits		
Brioche/croissant		
Packed snacks		
Cereals		
Chocolate		
Cracked slices		
Fruit		

5 **. Do you eat mid-morning snack?**

Yes	No	Sometimes

6 **. What do you usually have for lunch?**

	Often	Never
Main course		
Second course		
Sandwich		
Vegetables garnish		
Bread		
Fruit		
dessert		

7 **. What do you usually have for** dinner?

	Often	Never
Main course		
Second course		
Sandwich		
Vegetables garnish		
Bread		
Fruit		
dessert		

8 **. How much water do you drink during a day?**

Less than half a liter	
About one liter	
1-2 liters	
More than 2 liters	

9 . **How many times a week do you eat this kind of food?**

Food	Often	Sometimes	Never
Meat			
Fish			
Eggs			
Cheeses			
Cold meats			
Milk			
Pasta			
Legumes			
Vegetables			
Fruit			
Cakes and sweets			

10. **Except school hours , how much time do you spend practicing sport?**

Everyday	Twice -three times a week	Never

11 . **How long do you spend watching TV or playing videogames?**

Less than one hour a day	1 -2 hours a day	More than 2 hours a day