Projekt współfinansowany w ramach programu Unii Europejskiej „Erasmus+”

Erasmus+
Enriching lives, opening minds.

CREATIVITY AT SCHOOL

TIPS FOR TEACHERS

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INTRODUCTION

What does creativity mean?

The popular English dictionary defines the adjective 'creative' as follows: '1. having the power or ability to create things. 2. showing imagination and originality as well as a routine skill.'[1] It reflects a common (mostly intuitive) understanding of this term which is usually used to describe an active attitude that results in creating new, original artifacts or solutions. Creativity as a human feature is regarded positively. We want to be surrounded by creative people as we believe that one cannot possibly get bored in their company. Employers want their employees to be creative because they think that creative workers will be more efficient in solving problems that may occur while performing the assigned tasks. Children with imagination greater than their peers' who often express it in many different (mainly artistic) ways are also described as creative – and we often claim that school should not deprive them of this feature.

Researchers do not give one definition of creativity, but all these intuitive meanings reveal the very essence of creativity as defined by scholars. Creativity enables us to look at the same things and problems that everybody else, but to see them in a new way, to notice something that everybody else is missing, and to be able to find new usage for 'old' things or new solutions to 'old' problems. As J. Fazlagić has put it: 'To be a creative person means to see what everybody else can see, but to think about it differently. Creativity enables creating and recognizing new ideas, alternatives, possibilities that can help in solving problems, communicating with people, entertaining oneself or others.'[2] Everybody agrees that school should teach or at least enhance students' creativity. Most teachers, parents, and students would probably also agree that school should teach creatively and that is (according to the intuitive definition) interestingly, innovatively, and efficiently.

Creative teaching must abandon the behavioral model based on the passive transmission of knowledge and should replace it with an active model that aims at engaging students in the process of learning. Creative teaching also requires the ability to look at the subjects taught by teachers for so many years from a different perspective in order to find new ideas and didactic methods that will better meet the expectations of each particular group of students facing different challenges of the constantly changing world around. Teaching methods must respect students' individuality, their different educational needs, and preferences. Such an approach requires both the creative attitude of the teachers as well as their ability to use the already existing didactic methods to achieve their goals. Teachers must look at the educational system they belong to from outside, to see its disadvantages and suggest possible solutions. This publication aims to support teachers in doing so, therefore it provides them with a short presentation of such didactic methods which are particularly useful in creative teaching and a set of class scenarios (for single lessons or more complex didactic projects) that are based on the creative attitude towards teaching and learning and can be easily incorporated into each teacher's practice.

There can be no doubt that creative teaching enhances students' creativity. Therefore, though our goal is to support teachers who want to teach creatively, interestingly, and efficiently by offering them ready-to-use didactic aids, we do believe that this approach to education will also enhance students' creativity as they are the most important in the system of education.

Creativity is intelligence having fun

~Albert Einstein

Creativity is one of the most valuable, engaging and enhancing skills that embraces both learning and teaching. According to professor Margaret Boden from the University of Sussex, creativity can be defined as follows:

'*Creativity is a fundamental feature of human intelligence in general. It is grounded in everyday capacities such as the association of ideas, reminding, perception, analogical thinking, searching a structured problem - space, and reflecting self - criticism. It involves not only a cognitive dimension (the generation of new ideas) but also motivation and emotion, and is closely linked to cultural context and personality factors.*' [3]

Although creativity involves imagination, openness and eagerness to discover new ideas, it does not mean that we are all artists. It means that we know how to combine different ideas and make our brain create some unexpected but amazing thoughts. Being creative means that people have learned something, they have gained some knowledge and achieved the goals they have set themselves. Creativity is inextricably linked with so called "divergent thinking" as both generate creative thoughts by exploring some solutions. To inspire students to get out of the box that can be called "traditional learning", it is important to start asking them a great amount of questions and trying to find as many answers as possible. Thus, techniques such as brainstorming, mind mapping, free-flow writing and speaking can be treated as a great source of creative practice. Taking a closer look at brainstorming it can be defined as a situation where a group of people gather together to generate lots of new solutions, thoughts and ideas based on the specific word or topic. The purpose of this technique is to feel free to say everything that comes to people's mind. All the words or expressions are noted down, the next step is to analyse and evaluate them. Finally it occurs that genius images are born.

Mind mapping is another technique worth mentioning. It combines pictures, photos, drawings, links, lines and notes that can be considered as a type of spidergram. It can be defined as a graphic note that is linked via lines. The more colorful it is, the more interesting for the learner or reader it becomes. The last but not least of the techniques mentioned above is free-flow writing and free - flow speaking. Free - flow writing is a great tool that helps students express their feelings, emotions but also a tool that is needed to unlock creative thinking. It can be used instead of speaking as some people can feel uncomfortable or insecure if they are exposed to public performance. Our brain is an organ that is responsible for the battle of thoughts which takes place all the time. It can help overcome different obstacles and find unexpected solutions. Free-flow writing can lead people to different directions, not only by focusing on the topic and creating an expected end, but also on contrasting conclusions and creating an unexpected twist.

There is another aspect related to creativity and surprisingly for some people it is just happiness. Scientists say that the level of creativity is linked with the mood you are in, that is why being happy helps your brain with creating loads of amazing ideas. The more positive your mood is, the more creative you become.

Going further towards creativity, it is impossible not to note positive factors such as taking "time out", "having a break", daydreaming and sleep. These components give us some kind of distraction from everyday tasks, a possibility to relax and ability to refresh our mind, that is why our capacity for creative thinking depends on the situation we are in, personality and the way our brain works and the way it can be trained. As creativity is an inborn personal feature that everyone has, it is important to remember about this uniqueness and focus on using it in the best possible way.

All these ways of generating creative thinking are of utmost importance for learning and teaching.

To help students getting into creativity, teachers should find their own way to discover the ability of creative teaching in themselves. There is a great variety of teaching methods that can be used to awake students' willingness to take part in classes in an active and creative way. Teaching is like acting, and teachers can be compared to actors. They use non-verbal communication to show the meaning of the word, to encourage students to guess the context and to show something. Teachers should remember that the way they teach influences students' motivation and curiosity, but they also have to remember that the method they choose should be inspiring and fascinating for themselves[4].

Nowadays the most important part in teaching and learning process is implementing and using creativity thus the following methods can be listed:

1. PBL - Problem Based Learning / Project Based Learning - it is a student - centered approach. The role of the student is to learn about the specific topic by experience, cooperation with classmates, creativity and solving the problem*.
2. Flipped classroom - it is a type of blended learning, that is focused on increasing students engagement and studying first at home (all the material are given or recorded by the teacher), and then sharing and discussing the gained knowledge at school
3. Game - based learning / Gamification - teaching through fun and creativity. Using different games students can repeat the knowledge they have gained and enjoy the learning process at the same time. Games are based on teaching and learning through experiments, memory, creativity and communication.
4. Enquiry - based learning / Inquiry based learning - teaching and learning through posing a question or a problem. This method is based on activating students' curiosity and it turns students into explorers.
5. Kinesthetic learning - teaching through 'doing', students are actively engaged in their learning, they experiment, create and move
6. Role play - teaching through role-playing develops interpersonal skills and enhances creative thinking**.

*https://rb.gy/9yr4qi, https://rb.gy/4tfnja, https://rb.gy/aatald
**https://rb.gy/l4qdto, https://rb.gy/khgeaw

Didactic games are a type of educational methods which belong to the group of search and problem methods. They allow for the development of pupil's imagination and creativity. They organise educational content into models of real phenomena, situations or processes. The use of didactic games in school and non-school education allows for more effective teaching.[5]

The aim of using didactic games in education is to develop the pupil's creative approach to the model of reality reproduced under the conditions of the game, but also indirectly to a creative approach to real issues in the surrounding world. Games direct the pupil to think about the future and force them to reflect on the consequences of current decisions. In order to achieve a creative attitude on the part of the pupils, it does not matter whether they think about the consequences of their decisions in game conditions or about the results of their actions in real life.[6]

The method of didactic games can be used at any stage of school education and in lessons of any subject.[7] [8]

Numerous examples of games are available in methodological literature and on the Internet. Many of them have been developed in a version ready to be used in lessons or extracurricular classes. They deserve to be promoted and used in education.

I propose, however, to treat the game not only as a tool leading pupils to a set goal. I suggest that the game itself should be developed as a result of pupils'; creative activity. Creating one's own game ensures optimal adaptation to the pupils'; age, knowledge and skills, as well as to the subject or subjects in which the game may be used.[9]

The game model, which includes the basis for the construction of its rules and the board scheme, but does not specify the school subject, age of pupils, thematic scope, questions or instructions, has been created by the author and can be freely used by teachers together with pupils. Depending on the creativity of the users, an infinite number of games can be created, which will always be suitable for their creators.

TURKEY

According to the Constitution of the Republic of Turkey, every citizen has the right to education which is free of charge for the compulsory primary education. Since 2012, twelve years of education is compulsary for boys and girls, which can be divided into 4 + 4 + 4 years of schooling. The Ministry of National Education (MONE) runs educational administration of the country.[10]

Formal education

Formal education is the regular education of individuals in a certain age group and given in schools. This includes Pre-Primary education, Primary education, Secondary education and Higher education institutions.

Pre-Primary education

Pre-Primary education is an optional education for children between 3-5 years of age who are under the age of compulsory primary education. The purpose of this education is to ensure physical, mental and sensory development of children and the acquisition of good habits, to prepare children for primary education, to create a common atmosphere of growth for those living in inconvenient circumstances and to ensure that Turkish is spoken correct and well.

Primary education

With a new Law in 2012, four years of Elementary school + four years of Middle school is compulsory today, followed by four years of compulsory high school education (makes a total of 12 years compulsary education). Primary education is compulsory for all boys and girls at the age of 5,5 and is given free of charge in public schools. In the primary schools, foreign language lessons start from 2nd class.[11]

The purpose of primary education is to ensure that every child acquires the basic knowledge, skills, behaviors, and habits to become a good citizen, is raised in line with the national moral concepts and is prepared for life and for the next education level parallel to his/her interests and skills.

Secondary education

Secondary education is compulsory for 4 years and covers general, vocational and technical high schools (Lycees, Lise in Turkish) that provide four years of education. The purpose of secondary education is to give students a minimum common culture, to identify individual and social problems, to search for solutions, to raise awareness in order to contribute to the socio-economic and cultural development of the country and to prepare the students for higher education, for profession, for life and for business in line with their interests and skills.

Higher education

Turkish universities are Republican institutions, following Atatürk's principles. Universities, faculties, institutes, higher education schools, conservatories, vocational higher education schools, police and military academies and colleges, and application-research centers are considered as higher education institutions.[12]

Universities, faculties and institutes of four-year higher education schools are founded by Law, while the two-year vocational schools, departments and divisions are established by the Council of Higher Education (YÖK).

Non-Formal education

Non-formal education in Turkey is offered by a network of training centers who are supervised by the Ministry of National Education (MONE). Non-formal education services aim to teach reading-writing, help to continue education of students for finish their incomplete education, teach balanced nutrition and a healthy life style, teach people from various professions the knowledge and skills they need to improve themselves, and so on.

The components of creativity

So what exactly is creativity? Creative thinking is the process of sensing difficul-ties, problems, gaps in information, missing elements, something askew;making guesses and formulating hypotheses about these deficiencies, evalu-ating and testing these guesses and hypotheses; possibly revising and re-testing them; and finally communicating the results (Torrence, 1998).

The value of creativity in education

Creativity is valuable in education because it builds cognitive complexity. Creativity relies on having deep knowledge and being able to use it effectively. Being creative involves **using an existing set of knowledge or skills in a particular subject or context to experiment with new possibilities in the pursuit of valued outcomes**, thus increasing both knowledge and skills.

Expenditure on education in Turkey is increasing but educational attainment is still among the lowest of the Organisation for Economic Co-operation and Development (OECD) countries. 'Raising standards of achievement is seen as fundamental to economic performance' and social change.[13] However, international benchmarking studies such as PISA and PIRLS report low levels of attainment as far as Turkey is concerned. Attainment in the areas of mathematics, reading and science is included in the 16 indicators on the quality of school education.[14]

To upgrade educational provision, Turkey had made some alterations in the education system. Two reform initiatives in particular have captured the attention of various stakeholders. One is structural, with one of its main objectives being to decentralise educational provision in Turkey. It did not succeed when it was first introduced in 2004, but it is still being reconsidered. The other one is curricular: it was launched in 2005, and the aim was to make major alterations in the educational system with a view to preparing young citizens better for the real world.

Structural reform

Educational reform initiatives in Turkey are not only curricular but also structural. A structural reform intends to redefine the central role of the Ministry of National Education, and to reallocate roles and responsibilities accordingly. However, the suggested changes resulted in major controversy, and they still await solution.

Curricular reform

The main objectives of the curriculum reform are:[15]

- to reduce the amount of content and number of concepts,
- to arrange the units thematically to develop nine core competencies across the curriculum,
- to move from a teacher-centred didactic model to a student-centred constructivist model to let students think out of the box,
- to incorporate ICT into instruction to monitor student progress through formative assessment,

- to move away from traditional assessment of recall, and introduce creative and authentic assessment,
- to enhance citizenship education,
- to introduce second language courses from primary school.

In recent years, scientific views have become dominant, leading the Ministry of National Education to become more sensitive to new philosophies and to create policy innovations. Since 2002, the Turkish elementary and secondary education systems have been working to restructure according to the basics of the constructivist approach. This change is rather critical, as it is the first movement that draws a framework for more creative education in Turkey. The first prospective academician to study and introduce the concept of creativity was Inci San, a psychology professor at Ankara University. Her studies focused on the development of artistic creativity in children. Most of her research aimed to investigate the underlying sources of creative dramatics and the introduction of Western literature to Turkish educators and workshops in creative dramatics. According to San, emotions and personal thoughts constitute the primary part of artistic creation. This subjectivity, that is, perceptual differences based on people and the ability to think imaginatively, are important elements that come to the fore when art and creativity are handled together.[16]

Emrehan Halici, president of the Turkish Intelligence Foundation, claimed in the Workshop in Intelligence and Creative Education that creative will is a search for the better, correct, and beautiful, and it should be induced during the educational process. Most of the greatest developments and creations in science, technology, and arts are the results of this search.[17]

At the workshop, Ilhan and Okvuran,[18] asked the participants about the factors that inhibit creativity, and they identified four factors and concepts. The first item is family pressure. This includes not allowing the youngster to go out after a particular time; inhibiting the youngster's choice of career; inhibiting his or her education; lacking respect for the child; and overloading a child with responsibilities. The second item is social pressure. This includes lack of freedom, participation, tolerance, and conflict resolution and social alienation.The third item is the economy. This includes an insufficiency of physical facilities; poor teacher quality; teachers who have to have second jobs; the failure of families to satisfy primary needs; a lack of family planning; and problems concerning unemployment. The fourth item concerns traditions. This includes a low-level education in the society; religious beliefs; and stereotypic attitudes. At the workshop, alternatives for enhancing creativity in the Turkish educational system were generated. Among many suggestions, the most interesting ones are presented here:

1. Teachers should know themselves as individuals.
2. More time should be devoted to development of individuality.
3. Children's responsibilities must be reduced.
4. Learning environments, in terms of facilities and new concepts, must be developed.
5. There is no 'creative job' – every type of career can be creative, depending on the potential of the individual.

A pioneering study about the effects of teaching methods on creativity and logical thinking was done by Aksu. She investigated the effects of different types of teaching methods (laboratory oriented vs. lecture oriented) and gender on science achievement, logical thinking ability, and creativity of fifth-grade students. Aksu found that the laboratory-oriented method of teaching science was significantly beneficial for concrete operational reasoning, but not for creativity.[19]

At different stages of the Turkish educational system, creative curricula for various age levels were developed by researchers to foster creative thinking skills. Oral developed an activity-based spiral curriculum for enhancement of creativity in five-year-olds[20]. There were 3 classrooms for the five-year-olds,in the kindergarten. All three groups were taken as intact groups in the Middle East Technical University kindergarten, and they were randomly assigned as an experimental and two control groups. The Torrance Tests of Creative Thinking (TTCT) – A Figural Form was administered as a pre test and post test measurement. The two control groups followed the existing curriculum, which was developed by the administrator and the teachers of the kindergarten, whereas the experimental group was given the activity-based curriculum. The program used by the kindergarten focused on teaching social rules and keeping children under control and safe. The activity-based curriculum, in contrast, other hand, aimed to develop children's creativity and divergent thinking skills through a systematic order and presentation of the topics, giving opportunities for observing, testing, and discussing, and generating alternative ideas on questions and problems.

About higher education, new projects such as Support to Basic Education, which is financed by the European Council, have been implemented. The scope of the Support to Basic Education Project is the transformation of the basic philosophy of Turkish elementary education. In the project, the emphasis is directed from the previous didactic, knowledge-based education to a constructivist approach in education. The constructivist approach focuses on developing pupils' skills in cognitive, affective, and psychomotor domains, by considering their learning needs, intelligences, motivation, interests, and abilities, as well as their social and physical surroundings.

Within the past decade, innovations in the Turkish educational system have started to be realized. Although these innovations are slow and limited to pilot studies, they are the pioneers of academic work produced by theoretical views and practical experiences in the field of creativity in Turkish culture. Our universities started courses and seminars such as creative writing, thinking education, and theories of creativity for various degrees, including education, mass media, fine arts, economics, and administration. The number of scholars who discover the importance of creative development in science and social science increases each year.[21]

To support and boost creativity there are Science and Art Centers (BİLSEM) as public institions under the supervision of the Ministry of National Education general directorate of special education. The purpose of BİLSEMs are to ensure that gifted students pirmary, secondary and high school age are aware of their individual abilities and use their capacities at the highest level by developing them. It is a Project based center creating opprotunities to join in many different kinds of national and international projects hold by The Scientific and Technological Research Council of Turkey (TÜBITAK).

How to be a Science and Art Center student?

BİLSEM offers a unique public education for gifted elementary and secondary-school aged children. The students have to pass an IQ test and some talent exams(art and music) to enter this school.

The learnıng models of BİLSEMs

Project-Based, interdisciplinary, enriched and differentiated education programs which are suitable for students' abilities are implemented and educational activities are organized in order to realize original products, projects and productions and to increase creativity.[22]

Contemporary theories of teaching and learning (such as cognitivism and constructivism) emphasize the need for the student's engagement in the learning process, respect for individuality, a focus on cooperation and interaction, independent thinking as well as learning through experience, practice, and testing new knowledge.[23] Including these elements in an education system promotes creative teaching and enhances students' creativity. There are many didactic strategies that are suitable for this kind of teaching. For example: GROUP WORK, FIELDWORK (strategies that require leaving the school premises and testing the theory learnt at school in real life situations, which gives students an opportunity to use and practice the knowledge they have gained), INTEGRATION SEMINAR (an interactive method of teaching that integrates issues and materials from different disciplines/subjects; it uses discussions, exercises, role playing, simulations, tasks etc.), MICROTEACHNING (students teach their peers about a certain problem that they have been previously working on individually or in groups), PBL – PROBLEM BASED LEARNING (a teacher supervises a group of students who try to solve the problem independently using the knowledge they have gained, the teacher supports students by asking key questions, monitoring how they draw conclusions, but not by giving them ready solutions), PRACTICAL (learning through practice), PROJECT (strategy that integrates issues and knowledge from different subjects/disciplines, students work independently supported by the teacher), STUDY VISIT (students leave school premises to experience some real life situations in order to see otherwise theoretical knowledge in a new context or simply to learn things that cannot be taught at school). Polish teachers are familiar with these methods and strategies of teaching and all of them can be introduced (more or less frequently) into their teaching practice.

Unfortunately, **'as the report ordered by the Ministry of Entrepreneurship and Technology proves, the Polish school does not support students' creativity. This is because teaching is based mostly on memorizing a large amount of data, strict division between subjects, favouring quiet and obedient students and preventing any spontaneous actions.'[24]** It results from behaviouralism which is a dominating approach to education in Polish schools and it is based on the passive transmission of knowledge, which limits the student's role to being one who obediently learns what he is told. Additionally, some formal requirements make it difficult or even impossible to introduce several teaching strategies that are regarded as particularly effective in supporting students' creativity. For example, the case of the project method. Complex, interdisciplinary projects that integrate the knowledge of several different disciplines to solve a certain problem, are particularly valuable because they refer to the very essence of creativity: they teach how to define problems, find new solutions or create more effective alternatives for already existing ones. They also shape cooperation skills as solutions can only be worked out if the whole group contributes and participates. Using this effective method in Polish schools on a regular basis would require some important legal changes. Polish educational law and regulations on the framework of curricula impose a division into subjects, with each subject having a prescribed number of teaching hours per week. This legal problem revealed itself during the SARS-CoV-2 pandemic when Federacja Inicjatyw Oświatowych and Edu-Klaster proposed introducing so-called 'educational bubbles' as an alternative to the Ministry approved sanitary regime that was supposed to guarantee health security for students and teachers. The concept of 'educational bubbles' was based on the idea that each class is supervised by one or a maximum of only two teachers for the whole school year which originated as a remedy for the pandemic: it was safer if students did not have to meet with many different subject teachers who could easily transmit the virus from one group of students to another.[25]

However, it is impossible not to notice that such a model requires integration of subjects/knowledge and it could effectively be used in project teaching. One teacher can supervise the whole project and manage all tasks appointed to the students with close cooperation with different subject teachers who would offer specialized knowledge of their fields of expertise (in the age of online teaching we can easily imagine a situation that students, during the pandemic, stay in a class with their teacher and meet other subject teachers online whenever it is necessary; in a non-pandemic world such an online formula could be dedicated to meeting with experts: scientists or for example entrepreneurs who can explain practical aspects of certain issues).

The concept of 'Educational bubbles' – though born in response to the safety requirements in the pandemic world – could have been (it was also the authors of this concept's intention) an interesting solution for the Polish education system in general, also in non-pandemic conditions. Legal problems (changes in Polish educational law) seemed possible to overcome. However, this idea was never put into practice and was neither continued nor adapted in any way. As a result, teachers who wish to manage complex interdisciplinary projects with their students can do it only as a part of extracurricular classes. During a single lesson, one can only introduce some interdisciplinary tasks that can integrate knowledge from different subjects or even use one subject to explain another subject's content.[26] A very good example of such a strategy is the Polish language lesson scenario suggested by Maciej Pabisek: interpretation of Wisława Szymborska's famous poem 'Kot w pustym mieszkaniu' [A cat in an empty apartment] is combined with Schroedinger's cat experiment. As the author of this scenario claims: **'Combining issues as different as text interpretation and the basics of quantum mechanics, though surprising, can effectively shape some key competencies. It also makes students realize that strict divisions ofknowledge into subjects is an illusion based simplifying them into various disciplines and allows them to analyze well-known literary texts in a completely different way.'[27]** This type of lesson is and can be successfully introduced into Polish schools – either by individual teachers or in close cooperation between different subject teachers. In the example mentioned above if a Polish teacher feels competent enough, he can introduce the physical context on his own, if not – he can ask the physics teacher to do it. This type of interdisciplinary and trans subject integration of knowledge is possible within the Polish education system and does not require any changes in our educational law. It is worth mentioning that such an approach to education is promoted by publications devoted to modern didactics as one that fits the concept of so-called 'third culture'.[28]

Using creative, engaging teaching methods at schools should be accompanied by essential changes in the methods of verifying learning outcomes. The Polish education system prefers testing that usually mechanically and reproductively checks how much of the learning content a student has memorized. The only feedback that a student gets is usually a mark, which does not provide any useful information on how he should proceed in the process of studying. Therefore, an important step towards creative teaching and students' creativity would be replacing testing as a universal method of verifying learning outcomes by formative assessment, which truly enables monitoring a student's progress and supporting him in achieving his goals. It seems necessary that to enrich the repertoire of methods in verifying learning outcomes, some underestimated methods in the Polish educational system could be introduced such as ASSIGNMENT, OPEN BOOK EXAMINATION, PEER ASSESSMENT, PORTFOLIO, REPORT, SIMULATION. It might be worth mentioning here that according to the report on students and teachers returning to schools after the pandemic, published by Centrum Edukacji Obywatelskiej [Center for Civic Education], 70% of primary and

and secondary school students (wherein the percentage is higher in the case of secondary schools students and it is 78%) are stressed because when coming back they expect a lot of extra work and they are afraid of being tested.[29] There might be several different reasons for that, of course, but such results should also be regarded as a sign that the system of evaluation used in Polish schools needs to be redesigned.

Increasingly we are hearing that Polish schools must offer more modern, more effective, contemporary theory based methodologies of teaching education than it currently does; education that will prepare young people to face the challenges of the changing world around them. Such postulates are formulated but also put into practice by different types of institutions involved in the development of educational systems. The Polish-American Freedom Foundation can serve as a good example. It introduces and supervises an initiative The Learning Schools (SUS).[30] Under this program courses and workshops areoffered for teachers, schools' pedagogical councils, conferences for schools' principals, post-graduate studies – with all these activities aimed at enhancing the effectiveness of Polish education, introducing modern methodologies of teaching and an innovative education quality assurance system. Using the experience gained from the SUS program, the Foundation supports some other initiatives financed by the European Union: 'Akademia Uczniowska' [Students' Academy], 'Cyfrowa Szkoła' [Digital School], 'Akademia Liderów Oświaty Szkoły Uczącej Się' [Learning Education Leaders' Academy], 'Szkoła dla Innowatora' [School for Innovator]. The last initiative mentioned above seems to be particularly important in supporting and enhancing creativity in the Polish educational system. As one can read on the project website: 'teachers at Polish schools do undertake many interesting initiatives aimed at developing certain pro-innovative competencies. Most of these activities, however, are of ephemeral and punctual character. Our goal is to work out solutions that enable effective and systematic development of pro-innovative competencies within the framework of subject curricula and some preventative educational activities'.[31] 8 to 11 teachers from each participating school can take an active part in the program – they are offered intensive training and experts' support (besides onsite or online training and individual consultations, teachers can also participate in summer school, study visits at innovative schools, have access to some effective educational tools and get support in creating their own). Special support is also offered to the principals of the schools participating in this program and the project budget partially covers the expenses of rearranging the space of the school so that it meets the expectation of pro-innovative teaching better (e.g. creating an interdisciplinary workshop room, changing the layout of the rooms, etc.).

Creative teaching and students' creativity can also be enhanced by the closer cooperation between schools and universities. They can not only provide professional experts' support in certain disciplines and fields of knowledge but can also supervise teachers' professional development or offer tutorials for school students. 'Uniwersytet Humanistów' [University for Humanities] program conducted by the University of Silesia in Katowice is an interesting example of such cooperation. This program offers several different types of activities dedicated to different groups of beneficiaries: there are lectures for teachers on different issues important for contemporary humanistic studies ('Uniwersytet Polonistów' [University of Polonists]), guest lectures and workshops at secondary schools in the Silesia region hosted by scholars working at the University of Silesia ('Mobilny Uniwersytet Młodzieży' [Mobile Youth University]) and a tutoring program that enables the most gifted secondary school students to develop their skills under the supervision of distinguished scholars and personal trainers provided by the University ('Uniwersytet Młodych

Naukowców' [Young Researchers' University]). Tutoring as a form of personalized education, introduced by Polish universities often with the support of the Ministry of Education and Science (Masters of Didactics project is one of the examples of such Ministry support) can also be regarded as a response not only to the lack of mass education, but an effective (though costly) didactic solution enhancing creativity.

IRELAND

If creativity in education is about moving from a model of the transmission of knowledge and facts (from teacher to a group) to a more individualised and personalised approach involving different and new ways of learning, then Ireland and its education system is, like many other countries, trying to be creative. What may have worked in the past, is now no longer suitable for the modern age in which we live.
Ireland has a national system of education. Unlike some other European countries, there is no regional system of education. Our system, for historical reasons, is quite centralised with the Department of Education https://www.gov.ie/en/organisation/department-of-education/ having a key role in the development of policy and in overseeing its delivery.

Primary level education in Ireland spans the ages from 5 years to 12 years of age. The curriculum for primary education was developed in 1999 and currently there is an ongoing consultation process to develop a new curriculum ready for delivery in 2026. The need for a new curriculum acknowledges that children's' experiences in Ireland of technology, of family life, of different cultures, beliefs, viewpoints and values is such that a new curriculum is needed. It is also needed because children have different abilities and needs and learn in different ways.
One of the other reasons for curriculum change happening at primary level is because changes have taken place in Ireland in the areas of pre-school education and also at second level and there is an acknowledgement by the Department of Education that there needs to be some connection and continuation of learning from pre-school education, to primary education and into second-level education.

Encompassing all of these changes is an awareness that Ireland's system of education needs to develop in students key skills and competencies such as being creative, being a digital citizen, learning to learn, fostering wellbeing, communicating, working with others, being literate and being numerate, managing information and thinking. Allied to these is also the need to have a different view of assessment, moving from assessment of learning (though this is still a huge element of our current system with a terminal exam, the Leaving Certificate, largely determining who gains entry to third-level education) to assessment for learning. Pedagogical practices also have a role to play in ensuring the development of the key skills and competencies that have been mentioned. Some of these aspects of curricular change, along with other aspects of creativity in the education system in Ireland will now be outlined in further detail.

Second-level education encompasses the ages of 12 years to 18/19 years. There is an exam after three years, which is called the Junior Cycle and then students have the option to complete a Transition Year before proceeding on to complete a two-year Leaving Certificate.
Junior Cycle is a three-year cycle which students generally start at the age of twelve and it offers great scope for creativity in teaching and learning. The Junior Cycle was developed by the National Council for Curriculum and Assessment (NCCA) – a specific body including government representatives, teachers, lecturers and trade union representatives. The Junior Cycle was introduced on a phased basis between September 2014 and September 2021. The aim of Junior Cycle reform was to move away from an examination-centered education where students relied heavily on rote-learning and reproduced information in a final, summative examination.

There are eight key skills of Junior Cycle: Managing myself, Staying Well, Managing Information and Thinking, Being Numerate, Being Creative, Working with Others, Communicating. The fact that creativity has specifically been outlined as one of the key skills of Junior Cycle shows how integrally the two elements are linked. Schools can now tailor the Junior Cycle to the individual needs and interests of their students and there is a great deal of choice and variety in the tasks and activities completed. In one resource created by the NCCA on the key skills of Junior Cycle they include the following quotation from Sir Ken Robinson: "Creativity is the process of developing ideas that are original and of value. Creative intelligence is dynamic, diverse and distinct". The fact that there is such specific reference to ingenuity within an official document on the Junior Cycle highlights the greater autonomy for individual teachers and schools.

Students study a maximum of ten subjects for Junior Cycle and there is a focus on literacy, numeracy and key skills. Schools have the option to offer short courses of one hundred hours (roughly half of an ordinary subject) in areas of their choice such as coding, Chinese language and horticulture. According to the NCCA, "Schools will have more freedom to design junior cycle programmes that meet the learning needs of all students. For students, the new junior cycle will mean that the curriculum available in their schools will be a mix of subjects and short courses as well as other learning experiences." The Junior Cycle acknowledges the fact that students learn in different ways and have different learning styles and so teachers can adapt activities to the needs of their individual students which helps students to deepen their knowledge and understanding of key topics and information.

One key motivator for reform at Junior Cycle was the desire to move away from the traditional summative Junior Certificate examination where students were encouraged to rote-learn large volumes of material. They wished to introduce elements of formative assessment through the introduction of continuous assessment. It was from here that the Classroom-Based Assessment (CBA) was introduced. In each subject at Junior Cycle, students now complete at least one CBA. These may involve spoken presentations on topics of interest to them (e.g. in English, Irish, History, MFL), project work (Science, Business Studies, Maths) or the creation of practical items or artwork (Woodwork, Home Economics, Art, Music). For the first time, students have the opportunity to draw on their own knowledge and interests and use these to create pieces of work that are unique and personal to them. They are intrinsically motivated to create these pieces of work and take great pride in showing off their knowledge and skills as best they can.

2022 will be the first year where the Junior Cycle has fully replaced all Junior Certificate examinations. Looking forward, there is no doubt that similar changes will have to be made to the current Leaving Certificate, which most commentators recognise as not encouraging creativity but rather rote learning for a terminal written exam. Senior Cycle reform would relieve some of the pressure on students and again provide students with autonomy and greater scope for creativity and demonstrating their own knowledge and skills.

The Transition Year

The Transition Year Programme in Ireland is "a unique, one-year programme that promotes the

personal, social, vocational and educational development of students and prepares them for their role as autonomous, participative and responsible members of society" (Transition Year Guidelines, 1994, Department of Education). Transition Year provides a bridge to enable students to make the transition from the more dependent type of learning associated with Junior Cycle to the more independent learning environment associated with Senior Cycle. It encourages the development of a wide range of transferable critical thinking and creative problem solving skills. According to PDST 'Transition Year Programmes – Guidelines for Schools' the aims of Transition Year are:

- Education for maturity with emphasis on social awareness and increased social competence
- Promotion of general, technical and academic skills with emphasis on interdisciplinary and self-directed learning
- Education through experience of adult and working life as a basis for personal development and maturity

Each school in Ireland has the opportunity to create a TY programme that meets the needs of their cohort of students. Our approach in Edmund Rice College is to survey our students, parents and staff on an annual basis so as to engage with the constantly changing needs of our students. We teach the core subjects from the Irish educational system such as English, Gaeilge, Maths, Religious Education, Guidance etc. Our students choose to study five subjects from a list of fourteen that they find particularly interesting. Our teachers also design 8 modules that all students will study for 8 weeks during the year. These modules change on a regular basis based on the feedback of students. They include things such as creative crafts, wood turning, car maintenance etc. A lot of these modules foster creativity in our students and allow them to develop skills that would not be possible to master under the constraints of an exam curriculum. Overall we hope that by the end of TY all students will be well-rounded, reflective young adults fully prepared and with the appropriate life skills for further study and life after school. In pursuit of the above aims a lot is expected of students.

Our approach to teaching and learning in TY is informed by the Theory of Multiple Intelligences, as defined by Howard Gardner. This theory states that people are born with an intelligence profile of bio psychological potential which manifests itself in many different ways.To date, Gardner has identified 8 different intelligences (detailed below) based on research which indicates that intelligence is multiple and occurs in different parts of the brain and the mind system. Gardner in his book "Frames of Mind" defines intelligence as the ability to "solve problems or fashion products that are of consequence in a particular cultural setting or community". This problem solving skill allows one to approach a situation in which a goal is to be obtained and to locate the appropriate route to that goal. The recognition of a multiplicity of intelligences requires that recognition of the development potential of a diversity of learning styles must now be tailored in the teaching-learning equation. This theory has implications for how teachers teach as well as how learners learn. Since TY embraces the nurturing of all the intelligences each student will have an opportunity to discover what combination best represents them, which in turn has implications for how best they learn, where best they learn but most importantly what they learn best. Edmund Rice College endeavours to provide a Transition Year Programme in which all students, who participate, will identify and value their individual intelligence profiles. In this way the student will discover their own individual strengths and weaknesses and will be shown how to take responsibility for their own learning by participating in learning strategies which are active and experiential. This will enable them to grow

and mature into confident adults with the ability to cope with life.

The Transition Year Programme is not confined or restricted by set syllabus but instead, it is a programme that is developed by teachers in the school and is specifically tailored to meet the needs of students and hence changes and develops each year to meet the needs of each individual group. Using both experiential and traditional learning where appropriate the TY curriculum in Edmund Rice College aims to provide opportunities for all individuals to gain an insight into areas of study, leisure, work and sport which they may not have encountered previously during their time in school. Participation in these new areas helps to build self-esteem, confidence and personality development. It develops life skills, promotes enterprise and community links and aids in better career decisions. Students also get the opportunity to develop to participate in both nationwide and worldwide competitions such as the BT Young Scientist competition, Junk Kouture and Mini Company. These competitions allow students to work alongside teachers in small focused groups to explore in-depth areas that they are particularly interested in.

Other unusual elements of the TY programme include the wide variety of workshops that are offered to students, work experience, fundraising opportunities and several day trips. According to the Transition Year Guidelines (DES, 1994) "It is intended that the Transition Year should create opportunities to vary the learning environment and to dispel the notion that learning is something that happens only, or even most effectively, within the classroom." All of our students in Edmund Rice College complete a minimum of two weeks of work experience in two different areas of interest. The workshops that we facilitate in school are highly engaging and require students to actively participate. Examples include CSI Experience, Bodhran making, self-defense etc. The workshops are often run by someone who is an expert in their field of work and who has passion to pass this knowledge onto students. Our recent survey of students at the end of Transition Year showed that 74% of students felt better prepared for Senior Cycle after participating in the programme.

The Arts and Creativity within the Irish Education System

Junior Cycle reform, as outlined above, witnessed a curricular shift towards a framework that would give schools more choice and flexibility in what they offered students and in how that learning was organised. It focused around eight key principles, including, for the first time in the h-story of the Irish Education System, consideration for the intended curriculum around Creativity and Innovation.

The novel focus on creativity within our educational landscape includes the following key areas; Imagining; Exploring options and alternatives; Implementing ideas and taking action; Changing and taking risks; Learning creatively; and Being creative through ICT.

In conjunction with this curricular shift the Creative Ireland Programme (https://www.creativeireland.gov.ie/en/) was established. This is an ambitious, all-government initiative which aims to position mainstream creativity at the centre of public policy over a five year period in a five-pillared approach; Pillar one being 'Enabling the Creative Potential of Every Child.' To achieve this goal a number of programmes were put in place in education settings by the Department of Education.

Creative Schools is one such programme and it supports schools in the provision of opportunities for students to build their artistic and creative skills. It aims to stimulate additional ways of working

that reinforce the impact of creativity on young people's learning, development and well-being. Since 2018, 464 schools have received €5,000 to support creative learning. Edmund Rice College, Carrigaline, was selected to participate in this scheme in 2017.

The National Association of Principals and Deputy Principals (NAPD) operates the Creative Engagement programme (https://www.creativeengagement.ie), set up in 2004, co-funded by the Departments of Tourism, Culture, Arts, Gaeltacht, Sport & Media and Education to encourage secondary school students to engage with the arts. Grants are awarded to schools for art education under clearly set criteria allowing art practitioners to work with students to produce work in visual art, music, theatre, dance, film and poetry. The programme strives to encourage creativity, initiative and complements curricular learning in the arts.

In May 2021, the Minister for Education announced a new arts in education residency initiative for both primary and post-primary schools. The new programme, titled BLAST (Bringing Live Arts to Schools and Teachers), will enable up to 400 new Arts-in-Education Residencies in schools annually. This initiative aims to support the integration of the principles and key skills outlined in the Arts in Education Charter and Pillar 1 (Creative Youth) of the Creative Ireland Programme (The Creative Youth Plan – Policy context and briefing, July 2021). The scheme will give pupils in schools all over the country the opportunity to work with a professional artist on unique projects to be originated and planned between the artist, the teacher and the school under the coordination of the Education Support Centres Ireland (ESCI) network of 21 full-time education centres.

Digital Learning - Being Creative through ICT

Integrating digital technologies into teaching and learning, and embedding digital technologies into curriculum and assessment processes in schools, as a way of not only facilitating teaching and learning but of also facilitating and encouraging creativity are vital development goals for the education system in Ireland. Many schools have used the School Self-Evaluation (SSE) process (http://schoolself-evaluation.ie/post-primary/) to integrate and embed digital technologies into learners' experiences. It is also appreciated that in consideration of the appropriate use of digital technologies has only just begun.

Skills in the area of digital technologies, including creativity, adaptability and openness to new technologies, are important for the learners in their lives today as well as for their lifelong learning. There is much international research on the importance of fully embedding digital technologies into the teaching, learning and assessment processes in schools. When used effectively as part of teaching and learning, digital technologies facilitate learners to collaborate, to solve engaging real-world problems, to research and analyse information, to communicate their ideas, and to share what they create with others beyond the walls of their classrooms.

The use of digital technologies and information and communications technologies (ICT) as part of teaching and learning in Ireland is not a new concept. There have been a number of government strategies and initiatives over the last two decades to encourage and promote the use of digital technologies with and by learners. Many Irish schools have embraced these challenges and developed innovative ways of incorporating digital technologies into learners' experiences. Recent curriculum reforms in schools have emphasised the importance of digital technologies and include statements of learning that focus on developing digital learning skills. For example, in the context of

the Framework for Junior Cycle, digital technologies are embedded across the framework's key skills and a number of short courses in the area of digital technologies have been developed by the National Council for Curriculum and Assessment (NCCA), while at senior cycle, Computer Science has recently been introduced as a subject for Leaving Certificate. At primary level, a new mathematics curriculum, which reflects the importance of computational thinking, is being prepared. Digital technologies will also be evident in the review and redevelopment of the primary school curriculum, with the inclusion of 'Being a digital learner' as a key competency.

The key guiding policy resource for schools is the Digital Strategy for Schools 2015 – 2020. It communicates the vision of the Department of Education for digital learning: To realise the potential of digital technologies to enhance teaching, learning and assessment so that Ireland's young people become engaged thinkers, active learners, knowledge constructors and global citizens to participate fully in society and the economy. It sets out a programme to embed technologies and digital learning tools in the learning experiences of children and young people in primary and post-primary schools. Central importance is placed on the integration of digital technologies into teaching, learning and assessment. The strategy advocates for a constructivist pedagogical orientation; that is, an approach to teaching and learning where learners engage actively and collaboratively in a process of determining meaning and knowledge for themselves.
Using digital technologies actively and collaboratively in learning assists in developing creativity in teaching and learning. Inspectors from the Department of Education noted that in 86% of the primary lessons and 81% of the post-primary lessons where digital technologies were used, they were used to a satisfactory or better degree by teachers to creatively engage learners. This is a positive finding in and of itself. However, inspectors also reported that in some lessons observed, the digital technologies were used solely by the teachers and were not used by the learners. The Digital Strategy for Schools (https://www.dlplanning.ie/post-primary/) advocates the use of digital technologies in schools in a constructivist way. This involves learners using technologies actively, sometimes in collaboration with others, as part of their learning. Inspectors found much encouraging practice in this regard in classrooms in primary and post-primary schools.

Despite many examples of effective practice noted, there is still some way to go towards realising the full potential of digital technologies to enhance teaching, learning and assessment so that Ireland's young people become creative thinkers, active learners, knowledge constructors and global citizens participating fully in society and the economy.

Over the past three decades there has been an increasing emphasis in education in Ireland on the development of creativity in both teaching and learning and in developing and nurturing creativity in students. However, there is still much to do, especially in the area of the Leaving Certificate syllabus which is currently under a process of reform.

PORTUGAL

The Portuguese educational system is basically structured as follows[32]:

Level of education		Nb years	Age range	Regime
Early childhood education and care		..	0 to 3	optional
Preschool education		3	3 - 6	optional
Basic Education	First cycle	4	6 - 10	compulsory
	Second cycle	2	10 - 12	compulsory
	Third cycle	3	12 - 15	compulsory
Secondary Education		3	15 - 18	compulsory
Tertiary education		...	18 -	optional

Although compulsory schooling starts with basic education, at the age of 6, preschool and early childhood education show a universal or almost universal rate of participation, along with other OECD countries[33], reflecting an increasing awareness of the key role that these levels of schooling have in children's development, learning and well-being, particularly for children from disadvantaged socio-economic backgrounds, that lack suitable home-learning environments.
As for secondary education, the target level of education of this publication, the choice of courses is either directed at university studies or to a more professional path. The courses available at this level offer a variety of areas of knowledge. Oriented to a more academic higher-education path, courses range from Science and Technology, Socioeconomic Sciences, Languages and Humanities to Visual Arts. For a professional path, there is a choice of professional courses, specialized artistic, technological courses and training, vocational education training, modified curricula and adult education and training courses. At the end of Compulsory Schooling, national examinations and academic grades represent a major issue for schools and secondary education students, teachers and parents, for they greatly determine student access to tertiary education.

The legislation

Historically a highly centralized system, Portugal has made several reforms to its educational system that have increased decision-making at sub-national levels. Consequently, in Portugal, multiple ministries are responsible for education. The Ministry of Education defines the curriculum, guidelines for national examinations, teacher recruitment and deployment, as well as the budget for compulsory school education. The Ministry of Labor, Solidarity and Social Security and the Ministry of Education are jointly responsible for Early Childhood Education and Care, vocational and further education and training. The Ministry of Science Technology and Higher Education oversees higher education. Other relevant bodies and ministerial structures include: The Educational Evaluation Institute, an autonomous body created in 2013 that specialized in external evaluation; The National Education Council, an independent body advising on educational issues and supporting stakeholder participation in pursuit of policy consensus; Regional Secretariats for Education in the Autonomous Regions of the Azores and Madeira, which develop regional plans for national education policy and manage human and financial resources; The Schools' Council, representing the viewpoint of schools through school leaders' representatives and acting as an advisory body; The National Agency for Qualification and Professional Education (ANQEP), which co-ordinates the implementation of policies related to vocational and further education and training; The Inspectorate-General for Education and Science (IGEC) ensures the legality of actions taken and monitors, audits and supervises the functioning of educational institutions. Other key education stakeholders include the National Association of Portuguese Municipalities, the National Confederation of Parents' Associations, and teacher Unions.

Educational policies are in line with European and international guidelines and investigation in the field of Education, and theoretically rely on modern didactics and methodologies to respond to the challenges of a global digital society. **The Basic Law of the Educational System, 1986[34]**, lies the groundworks for all the subsequent laws and decrees that regulate the educational system. In its relation to fostering creativity, the focus of this document rests on different aspects, according to the students' age groups and to their level of learning. In preschool teaching (3- to 6-year-olds) the

focus lies on children's ability to express themselves and to communicate, as well as on creative imagination and playful activities. Throughout basic education (7- to 15-year-olds) physical and motor development are introduced and developed, manual activities are valued, and artistic education is promoted, to raise the students' awareness of the several existing forms of aesthetic expression, but also to stimulate skills and detect potential talents. As to secondary school, it aims at strengthening the fundamental elements of a humanistic, artistic, technical culture, that constitutes a cognitive and methodologic support for the possibility of further education or to the students' integration into active life.

Students' Profile at the End of Compulsory Schooling (SP)[35]

This document, approved in 2017, sets a profile of what is expected from students at the end of compulsory education, and constitutes a reference and a common matrix for the decision-making process of educational agents in schools and other educational contexts, and for those responsible for devising educational policies. In its Introduction, it reaffirms the importance of equipping students with the necessary skills to "respond to the complex challenges of this century and to face the unpredictability resulting from the exponential evolution of knowledge and technology". This ambitious document, intimately linked to creative thinking and creative problem-solving (Figure 1), presupposes transversal and transdisciplinary competencies interrelating and mobilizing a solid set of knowledge, skills and attitudes, based on values that express the ideal essence of school culture.
School is invited to reformulate and adapt to meet the demands of the rapid change and unpredictability of our times. Teachers are urged to experiment new teaching methodologies, indoor and outdoor, in different social forms, promoting observation, questioning reality and integration of knowledge, cooperation, using sources of information and the media critically and creating spaces and opportunities for students to intervene freely and responsibly.

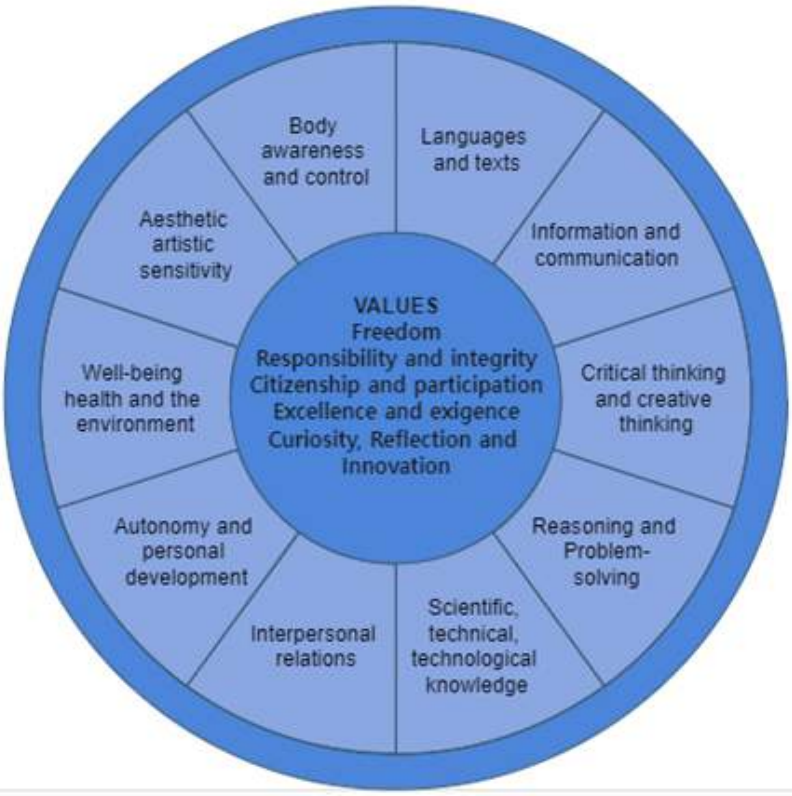


FIGURE 1: SKILLS AND THEIR UNDERLYING VALUES, ACCORDING TO THE STUDENTS' PROFILE AT THE END OF COMPULSORY SCHOOLING

Project of Autonomy and Curricular Flexibility[36]

Implemented equally in 2017, the Project of Autonomy and Curricular Flexibility, for basic and secondary compulsory education, is another important reference. Ultimately aiming at facilitating the operationalization of the profile of competencies that lead to a successful citizen (defined in the SP as someone who can integrate knowledge, solve problems, master different scientific and technical languages, cooperate, be autonomous, have aesthetic and artistic sensitivity/awareness and who cares for his own well-being), it establishes principles and rules to guide the creation, practice and assessment of the curricula of basic and secondary education. First implemented as an experiment,later consolidated by subsequent official guidelines and legislation and increasingly covering the different levels of compulsory education, this project's methodology lies on multidisciplinary workgroups which create, implement and assess projects, arising from the students' interests, balancing transversal competencies with the contents of the national curricula of the subjects involved and taking into consideration other activities planned by the school which may concur to the project achievement. This dynamic implies a project-based, problem-solving methodology, promoting a collaborative approach to teaching and learning. It is overseen by a national coordinating board, assisted by a technical workgroup, regional workgroups and by a consulting board.

Other official documents that constitute a reference in curricular development, also noteworthy in terms of their underlying interest in fostering creative thinking skills are:

Essential Learnings[37] (EL) – Stemming from existing documents, EL constitutes a common reference for planning, implementing and assessing teaching and learning, by defining what the students should know, the cognitive processes activated to acquire that knowledge, and the skills needed to put that knowledge into practice.

National Educational Strategy for Citizenship – Resulting from the conclusions of a workgroup dedicated to Education for Citizenship, a National Educational Strategy for Citizenship was produced and implemented in public and private schools already integrating the Autonomy and Curricular Flexibility Project, the SP and EL guidelines. Teachers are considered vital parts of this strategy as they are expected to prepare the students for life, to be democratic citizens, participative and humanistic in a time of growing social and cultural diversity, promoting tolerance and non-discrimination, and fighting violence and violent radicalisms.

Examples of good practices

Even before the legislative framework for education was democratic and with almost non-existent working conditions, education proved its strength. Such was the case of our school, EBSPMA, partner in this Erasmus+ project. The school was first founded in 1973, and in its beginning operated outdoors for lack of adequate facilities, furniture, or equipment, using all the space provided by the community (the market, the streets, the church, the beach, ...) to develop an innovative teaching methodology, as can be seen in this video from that time (https://arquivos.rtp.pt/conteudos/gaivotas-em-terra-uma-experiencia-pedagogica-na-madeira/).

Throughout the years that connect us to the 1974 shift in politics and consequent progressive shift in educational policies, there have been many examples of good practices, both nationally and at a regional level. Below, a few successful examples from the present day.

Digital coursebooks

In the 21st century, schools are confronted with a digital generation that faces new challenges. The uncertainty of the labor market and the vertiginous technological evolution of the present times places young people in a particularly difficult situation, as they need to be prepared for unpredictability. It is therefore imperative to train young people to be capable and competent in performing jobs connected to new technologies. On the other hand, traditional methodologies make the learning process uninteresting and inadequate for the present. The weight of coursebooks in the backpacks also makes no sense when compared to the massification of digital knowledge. Digital coursebooks is a project of the Regional Secretariat for Education in Madeira, applicable to all schools of the second and third cycles of education. The project aims at equipping all students with a tablet for access to digital coursebooks and online teaching-learning platform of educational resources. It constitutes a curriculum structuring tool, enhancing collaborative work, using a problem-solving approach, promoting stronger motivation among students and the increase of their critical thinking skills, while simultaneously allowing for curricular flexibility, inclusive education and pedagogical differentiation.

Computer science

This regional project intends to prepare students to be informed agents of our society, independently of the career path they choose. To achieve this aim, the project focuses on programming, the internet, artificial intelligence and other areas of technology, equipping the students with the necessary knowledge of different concepts pertaining to how the digital technological world operates and evolves, to prepare them for the future challenges and problems our societies will no doubt be forced to deal with. Teamwork, collaborative work and cooperation, under the guidance of teachers, are the methodologies on which this project was designed and put into practice.

STEAM Methodology

Coordinated by the European Schoolnet (Belgium) in partnership with Istituto Nazionale di Documentazione, Inonovazione e Ricerca (Italy), Line University (Italy), the Ministry for Science and Education of the Croatian), Republic, the Ministry for Education of Portugal and the University of Cyprus, this project is at present being developed at a national and regional level. Its designation arose from the term STEM (Science, Technology, Engineering and Mathematics) and was expanded to include A, representing Arts, as a way of highlighting the importance of creativity, or in another interpretation, to refer to All, i.e., reinforcing the importance of connecting STEM to all other disciplines and for all the subjects to work together, in an integrated way, connected to real-life issues to ensure that future citizens will be ready to tackle any issues in society, in a collaborative, critical and efficient way. This project aims to create and test a conceptual framework of reference for integrated STE(A)M education; to develop a capacity building program for basic schoolteachers and secondary teachers, with a particular focus on the contextualization of STE(A)M teaching, especially through industry-education cooperation, and to establish a network of guidance counsellors/career advisors in schools.

We can undoubtedly conclude that the Portuguese educational system values Creativity, from early childhood education to the end of compulsory schooling. Especially in more recent years, legislation was created to favor the inclusion of creativity and creative thinking in teaching and learning practices, providing tools for the implementation of a methodology shift, from the traditional teacher-student dynamics to a student-centered approach, strongly based on the development of projects, problem-solving skills, cooperation and innovation. Teachers and education stakeholders are strongly encouraged to experiment with new social forms, novel didactic strategies and methodologies and pedagogical trends that make up contemporary approaches to learning and teaching. In addition, technology and computer sciences have become a reality in a considerable number of school establishments. Major publishing houses have followed the trend, introducing digital coursebooks and online resources, besides gamification that is fully underway. Moreover, Educational Services of Museums, Associations and other cultural entities provide activities and programs combining computer sciences, culture and creativity, working in partnership with schools. Kits for robotics, microbit coding and programming, Arduino projects and some 3D printers have been made available either by the government or by donations of the private sector.

But not everything is positive. Resistance to change is expected. Decades of teaching based on the division into disciplines, teacher-centered and focused on the extension of syllabuses, grades and examination results have left their mark on teachers, half of which are at present over 50 years of age (according to OECD, 50% of third cycle teachers and 44% of secondary teachers). Bureaucracy and extensive curricula are still problematic, stealing time to diversify methodologies, consolidate learning, as well as for pedagogical differentiation or interdisciplinary articulation. Decreased motivation among teachers (in 2018, OECD data shows that only 9.1% of teachers believed the teaching profession is valued in society) is by no means unrelated to the long-lasting effects of the financial crisis, added to job insecurity and overall unattractive career prospects. Also, the process of endowing school communities with suitable training and work conditions that allow for the shift educational policies envision is far from completed.

Finally, the pandemic, with its myriad effects, whether already identified, foreseen or completely unknown and unexpected, has inevitably delayed the implementation and assessment of many projects and good practices.

Introducing the Greek Education System

How is the Greek education system structured? Prior to proceeding to the analysis of the role creativity plays in Greek education, it is worth presenting an overview of the structure of the national education system. The Greek education system is based on the principle of **free education to all citizens,** and is mainly divided **into three levels: primary, secondary, and tertiary** (Eurydice, European Commission). In addition, there is a state post-secondary education level providing vocational training and it is up to the students' preferences to choose the specific field they want to follow. Most students in Greece attend public schools of all levels, for which there are no tuition fees while, according to the Hellenic Statistical Authority, between **4 and 6.5%** of the student population enrolls in **private schools of all levels** (Constantinides 2021).

In more detail, primary education is divided into kindergarten lasting one or two years, and primary school spanning six years (ages 6 -12) - Primary Schools in Greece operate between 8am and 1pm, while the majority of those offer extra classes on Physical Education, Art and Music until 4pm. Secondary education includes two sections, the Lower Secondary School (ages 12-15), constituting the last compulsory education level and the General Upper Secondary School (15-18), which is optional, and the students are called at the final year to take national exams that will define their entrance at the Higher Education System (tertiary), which is the last level of the formal education system. Higher Education System comprises:

The university sector:

- Universities
- Polytechnics
- The School of Fine Arts
- The technological sector:
- Technological education institutions
- The School of Pedagogical and Technological Education (ASPETE).

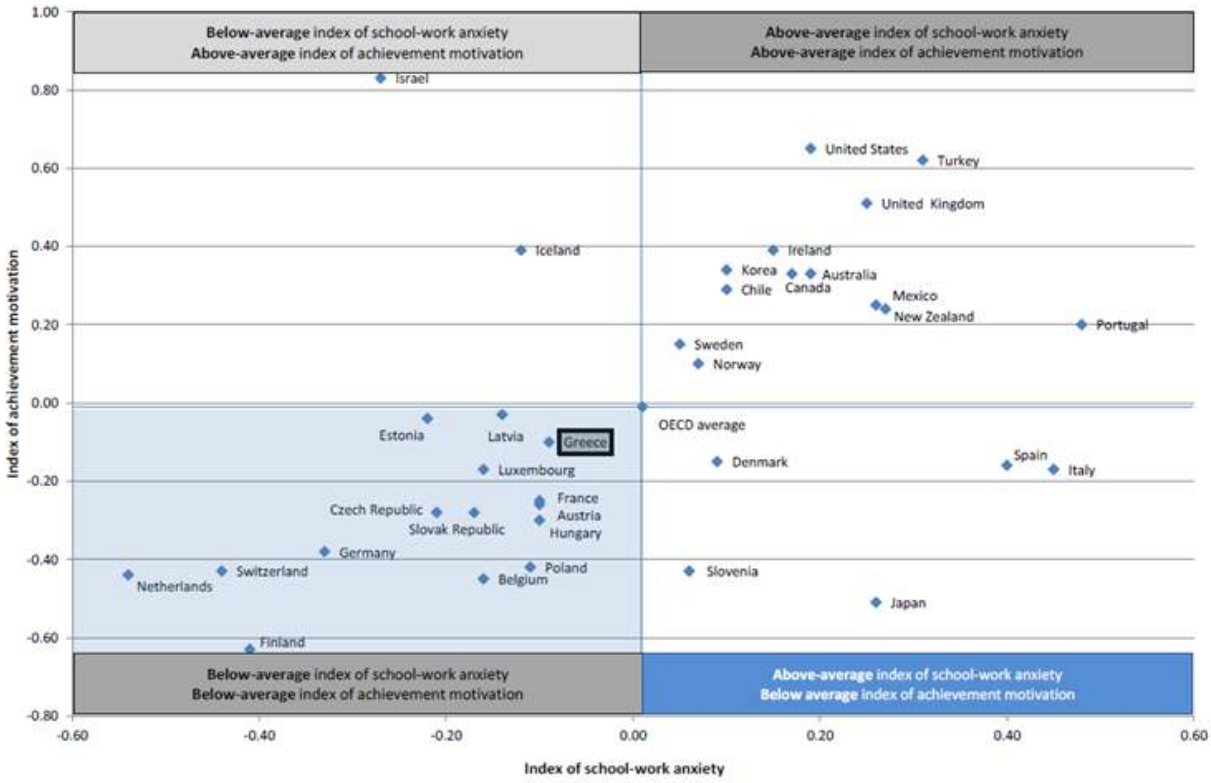
There are several types of schools found in the Greek educational environment, including arts schools, science schools, music schools, experimental schools, etc. that boost creativity and art making in the school environment and aim at highlighting talents and of the students. The entrance in these schools is feasible after nation-wide exams.
In more detail the Greek Education System is structured according to the following table:

PRIMARY EDUCATION AGE 6-12 (COMPULSORY)	SECONDARY EDUCATION AGE 12-15 (COMPULSORY)
• Primary school • Experimental Primary School SPECIAL EDUCATION • Model Primary School • Primary School for students with Special Needs	Junior High school • Evening Junior High School • Experimental Junior High School • Model Junior High School • Music Junior High School • Arts Junior High School • Multicultural Junior High School SPECIAL EDUCATION • Junior High School for students with Special Needs
	AGE 15-18 (OPTIONAL) • General High school • General Evening High School • Experimental High School • Model High School • Music High School • Arts High School • Multicultural High School SPECIAL EDUCATION • Special Vocational Education & Training Institutes VOCATIONAL EDUCATION • Vocational High School • Vocational Evening High School • Model Vocational High School • Vocational Training Schools

The Current Situation

Undoubtedly, Greece is among the countries that face challenges in its education system mainly due to the economic crisis and its devastating social and economic impact[38]. Indicatively, it is worth being mentioned that the level of teaching in Greek schools is being criticized due to the **lack of teacher evaluation standards and teaching structures[39]**. As a result, more Greeks fear obtaining adequate education in public schools to prepare for higher education. The Panhellenic exams required for university admission in Greece have caused an increase in Greeks pursuing more expensive private education classes. In 2015, according to the World Economic Forum Inclusive Growth Development Report, Greece was ranked last of 30 economies due to the relationship between student performance and parent income.

In addition, according to the 2015 results from the OECD Programme for International Students Assessment (PISA), both **student achievement and motivation**, as reported by students, are **lower than the OECD average[40]**. In particular, Greece is located below average in both school work-related anxiety and in achievement and motivation (ibid).



SOURCE: OECD 2018

Creativity does not constitute a concept emerging from modern society; it is a notion that goes back to ancient Greece and particularly to the ancient Greek age of Plato philosopher[41] and his contemporaries. Interestingly, "Plato's Ion emphasized society's need for creative people and urged the state to foster their development"[42]. At an initial stage, creativity had been embedded more in fields concerning technology and natural sciences, while never it lost its aesthetic and spiritual connotations. Creativity's most recent appearance in education began in the late 90's[43]. Since then, it has started playing a significant pedagogical and learning role, while it has gained popularity as a constant developing research topic among the academic society.

Policy Directions for Education System in Greece

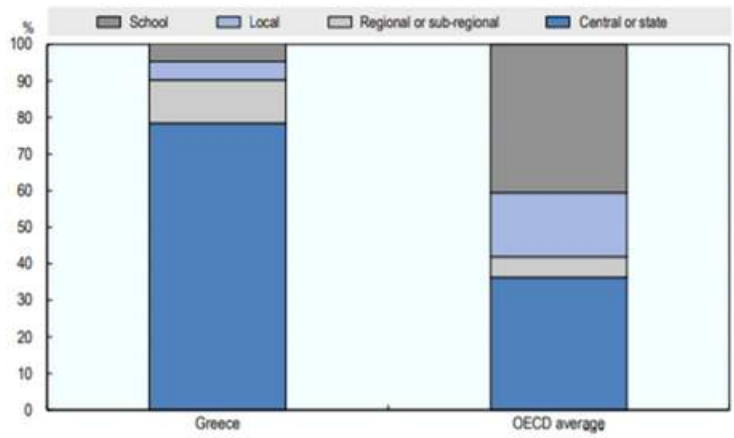
Greece is among the countries that have greatly acknowledged the valuable benefits of creativity in the educational sector. In recent years, there seems to be a sharp shift towards the concept of creativity in the Greek education system. It is evident that the image of Greek schools is steadily changing, and creativity and innovation are taking a significant place in classes. Although, the efforts from the Greek teachers at a local and regional level are impressive and impactful, the education system in Greece can be described as "highly centralized"; a characterization that was used to describe the system in a 1982 OECD review but is valid until today[44]. In order to better understand the term "centralized" as is used within the Greek education context, some key features of the Greek centralized education system are presented in the following table.

Key features of the Greek centralized education system
• national laws, presidential decrees and ministerial acts are prevalent
• The central administrative body for the education system across all fields, agencies and levels is the Ministry of Education and Religious Affairs. It takes the key decisions related to long-term objectives. It also regulates various issues, such as curricula content, staff recruitment and funding.

SOURCE: EURYDICE, EUROPEAN COMMISSION

"Highly centralized", as mentioned earlier, is a statement also supported by the data provided by OECD (2018). As the following chart shows, decisions taken in Greek public lower secondary schools regarding education are mainly driven by Central or State level in a percentage of around 80%. Only, a limited percentage – about 5%, corresponds to initiatives taken by schools' needs and expectations. As opposed to the OECD average, it is apparent that there is limited freedom in decisions taken by schools in the Greek education system, which means that creative teaching and learning methods may not find fertile ground to be developed by teachers and educators, due to that centralized decision-making policy.

Percentage of decisions taken in public lower secondary schools at each level of government



SOURCE: OECD (2018)

Examples of Good Practices of Creativity in Greek Education System

Greek teachers are making significant progress in discovering innovative and creative approaches to implement change in the national education system, even though it is "highly centralized". Indicatively, a Greek-Cypriot teacher, Andria Zafirakou, winner of the Varkey Foundation Global Teacher Award, used her 2018 prize winnings to set up a campaigning charity, entitled Artists in Residence (AIR), to get more artists and arts organisations into Britain's schools[45]. As well illustrated by Andria Zafirakou *"When you have kids who are not picking up arts because they do not know what the jobs are or don't realise the value of it, that's when alarm bells ring and you have to do something"*[46].

AIR strives to increase student aspirations, provide inspirational life opportunities, and prepare students for jobs in creative industries The basic learning material for AIR is a rounded curriculum that supports social and cognitive learning through engagement in art activities[47].
Apart from initiatives taken on an individual level, there are several private organizations that act in parallel supporting schools and educational centres. This is achieved by designing, planning and implementing creative activities to boost creativity for children at all ages. Examples of such organisations active in the Greek society are the following:

- Experiential School
- School of play
- Creative thinking workshops
- Theatrical workshops in education
-

At the following picture an example of theatrical workshops that are used for educational purposes for teens, implemented by the School of Play in Greece is presented:

SOURCE: INFOKIDS.GR[48]

PICTURE OF REALITY IN ART

HUMANITIES

PART 1. OF SCENARIO

TITLE	Picture of reality in art.
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	Polish, languages, art, culture
TYPE	*larger educational project*
DURATION OF CLASSES	*3 x 45-55 minutes (the duration of the lesson depends on the country)*
AGE OF STUDENTS	15-18

PART 2. OF SCENARIO

AIM OF CLASSES	Lesson objectives 1 : • I know the work of J. Malczewski • I can relate the painter's work to the historical and artistic context • I can analyze and interpret a painting • I can create a story with dialogues based on the painting Lesson objectives 2: • I can develop a scenario for a short scene inspired by a chosen painting • I am familiar with the components of a performance: dialogue, role play, set design, props, and plot • I can improvise to create a vivid story • Lesson 3 objectives: • I can play my part • I can create an account of the preparation and the performance on social media or as a lapbook or scrapbook with notes, comments, conclusions, photos https://pl.pinterest.com/afmoore25/sample-scrapbook-pages/ https://www.youtube.com/watch?v=nJbV-1cDPiM https://www.canva.com/design/DAFH1IdrhfA/ARQwZ4vb34h4i2ExZN1rcQ/edit?utm_content=DAFH1IdrhfA&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton • I can create a report in English and Polish. During the activities a special role will be given to working in teams to shape and develop soft competences. An important role will be played by encouraging students to think creatively and outside the box, to use their knowledge of visual and performing art.

PART 2. OF SCENARIO

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• the work of J. Malczewski • elements of a painting work • stages of work on a staging
	IN THE FIELD OF SKILLS	• communication skills: presenting, storytelling, non-verbal and verbal communication, listening, constructing and receiving feedback, public speaking • leadership skills: team building, delegating and problem solving, giving and receiving feedback, decision making, team management • interpersonal skills: relationship building • personal skills: emotional intelligence, self-awareness, managing emotions, tolerance of change and difficulties, adaptability, enthusiasm, empathy • creative skills: problem solving, critical thinking, artistic sense – ability to create/realise a vision
	IN THE FIELD OF SOCIAL COMPETENCES	soft skills : • communication skills, teamwork, creativity, multitasking • advising others • using body language consciously • motivating others • interacting with others
TEACHING METHODS	• project method: project-based learning • creative thinking method: communication, creative and critical thinking • thinking based learning: communication, critical thinking and creative learning: constructivist, collaborative, integrative as well as inquiry-based learning • problem-based methods: activating – enactment, discussion, group work • practical methods: demonstration, projects • expository method: drama • teaching method: improvisation, talk, lecture, storytelling • programming: the use of multimedia	

SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	tools: • multimedia - Google Classroom, canva • technological devices • paper • markers, pens and coloured pencils • classroom space (e.g. props) • blackboard materials: • costumes • props (organised by students) • reproductions of paintings by J. Malczewski • albums of paintings • information about the author and his works • links to galleries or national museums https://www.mnw.art.pl/multimedia/ https://artpower.pl/galeria-sztuki
PRELIMINARY CONDITIONS (if applicable)	no special skills, courses etc. are needed.
TIPS / METHODOLOGICAL REMARKS	• granting creative freedom • individual approach to the student and the subject • awakening artistic inspiration

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	Stage 1 • brainstorming / brainstorm (word cloud) • familiarisation with painting, contexts. https://culture.pl/pl/tworca/jacek-malczewski • familiarisation with the stages of the work. • searching for paintings and selecting figures for "art" (group working) • presentation of search results • attempting to create a story

	Stage 2 • creating a story: improvisation, writing down the story • writing down dialogue • work on set design and costumes Stage 3 • Final: - staging (possible recording) - publishing a report on a social networking site - creation of the final blog in the foreign language - creation of the final scrapbook in the foreign language
BASIC TERMS	art, Polish art, theatre, body language, imagination, creativity, masterpiece, performance, image, scrapbook

STRUC-TURE	LESSON 1	Each lesson can be taught by one and the same teacher (e.g. foreign language, mother tongue or art, etc.). If his/her knowledge of the foreign language is not sufficient, he/she can collaborate with the foreign language teacher when creating the scrapbook and blog. It is possible for several teachers to collaborate on a scenario, in this case it is necessary for the scenario teachers to meet beforehand and share responsibilities, e.g: mother tongue teacher - lesson 1; Art or theatre teacher - lesson 2; foreign language teacher - lesson 3. The teacher working with the project decides whether the lessons take place with a large time gap between the lessons (e.g. the whole project takes 3 weeks, with 1 week break between each lesson, or whether the lessons take place in close succession. It is worth considering a larger interval (e.g. 1 week) between the 2nd and 3rd lesson, as students may need or simply want more rehearsal time before the dress rehearsal of the performance. **Topic: Picture of reality in art.** STEP 1 10 min • The teacher welcomes the students and introduces the topic of the classes. • The teacher asks the students to think about the questions "What is art to me?" "What do I associate with art?" (brainstorming) • The teacher gives students time to think, selects 1 student who will write his/her colleagues' free statements on the board.

		STEP 2 5 min • The teacher divides the class into teams (division of students into teams depending on the size of the class) • The teacher introduces the students to the stages of the work, displays a presentation with the stages written down or writes them on the board (depending on technical possibilities): Stage 1 Familiarisation with the paintings, contexts. In groups, searching for paintings and selecting figures for "art". Presenting the results of the search Attempting to create a story. Stage 2 Creation of a story: improvisation, writing down the story Writing down dialogue Work on set design and costumes Stage 3 Final: staging (possible recording) publishing a report on a social networking site creation of the final blog in a foreign language creation of the final scrapbook in the foreign language STEP 3 10 min • The teacher asks the students to take into account the size of their group when choosing the painting they will work on during the project. • Using a variety of information sources, the students search for paintings by J. Malczewski, they make a selection individually and then brainstorm in a group to choose one to work with during the project. • The teacher supervises the students' work, and supports them. STEP 4 10 min • The teacher initiates the conversation by asking questions such as: • "What comes to your mind when you look at this painting?", "What feelings does this work of art trigger in you?", "What was the context in which this painting was created?" • The teacher together with a selected student from the group writes down the conclusions, thoughts. e.g. on the board in the form of a mind map or spidergram • All the students, together with the teacher, discuss the work of J. Malczewski, reflect on the meaning of the artworks, and find out the contexts. Students talk about the emotions that the paintings evoke in them and share the stories that form in their heads with the other participants in the project.

		STEP 5 10 min • Teacher summarises step 4 – discusses first impressions, associations, and intuitions evoked by the images. • Students in groups try to create a story around the image. They write down their first associations on pieces of paper in order to create a story and a scenario out of it. • The teacher supervises the students' work. • The teacher asks questions: "What happened a moment before the image and what happened a moment after?". "Think of this image as a frame from a film, imagine the earlier and later scenes, what images can you see?" "What emotions would you like to show?" • Students in groups improvise on the image, adding the new, their own story
	LESSON 2	**Topic: We become part of the picture.** **STEP 1 5 min** • The teacher supports with his/her knowledge the creation of the staging script (appendix 1). • Students independently write the scenarios. • The teacher advises the students to allocate within their group the elements of the script they would like to be responsible for • The teacher supports them during their work, making sure that all elements of the script are defined. **STEP 2 10 min** • Students, together with the teacher, reflect on the composition, the space (the teacher informs that the space is the classroom with all the equipment in it), the props (the teacher informs that the students can use the equipment from the classroom e.g. desks, chairs, blackboard), the sound layer (the teacher informs what equipment the group has in the room), the acting (body language). • The teacher discusses in order the different components of the performance. During this time students can make corrections to their scripts, add new ideas, they can also include the use of the classroom space. **STEP 3 5 min** • The teacher asks the students to decide for themselves how they want to work, i.e. they share the tasks ("Who is responsible for the coverage, blog, costumes, props, documentation, etc.?") and the roles they want to take on for the performance.

		STEP 4 5 min • The teacher asks the students to write down their impressions, thoughts (which they will translate into a foreign language). • Each student writes down a short account of their work that was done so far. As a group they also document their work by taking photos to create a report or scrapbook. **STEP 5 15 min** • The teacher asks each group (the order is decided by the teacher, it can be any order) to rehearse the staging in front of the other students and the teacher, all students are asked to give each other brief feedback (positive, creative, constructive criticism) after the rehearsal. • The teacher, by giving guidance after the rehearsals, supports the students' actions and may suggest fine-tuning certain elements. **STEP 6 5 min** • The teacher informs the students that they will have 1 dress rehearsal during the next lesson, the whole performance of 1 group should last a maximum of 2-4 minutes. • Within the needs of the group and on their own initiative, students decide what props and items are necessary for the performance (costume - wardrobe of parents, grandparents, friends) - they are able to organise everything for the next classes.
	LESSON 3	**Topic: Art becomes reality.** • The teacher supervises the preparation, rehearsals and performance of the groups. • The teacher does not comment on anything, he/she leaves space for the students to act, the teacher takes notes of his/her thoughts to give feedback to the students later. Each group needs time and space to act. **STEP 1 7 min** • The teacher asks the students to prepare scenery, props, costumes and make-up for their performances. • Students follow the teacher's instructions. **STEP 2 8 min** • The teacher informs the students that they can complete a dress rehearsal during the time of max 8 minutes. • Students should check if all the elements of the script are prepared and if the background music is ready, and finally if the equipment is working properly.

	LESSON 3	**STEP 3 15 min** • Performance by all groups, recording of staging. Teacher or selected student records the performance (if it has been decided to record). **STEP 4 15 min** • After the performances, students share their impressions – the teacher asks the question from the first lesson: "What is art to you?" • The teacher asks following questions: "Has your perception of art changed?", "What made it difficult for you?". "What has been an interesting experience for you?" "What emotions does the artwork evoke in you now?". Students answer the questions freely. It is time to talk about feelings, thoughts etc. **STEP 5 and 6** • These are the activities that will be completed within 2 weeks after finishing lesson 3: **STEP 5** • The teacher publishes an account of the project on the social network **STEP 6** • Students prepare a blog and a final version of the scrapbook in the foreign language • The foreign language teacher supervises and evaluates language correctness.

PART 4. OF SCENARIO

BENEFITS	• knowledge of the works of J. Malczewski • ability to write short statements • ability to analyse and interpret art • team integration • cooperation skills • stimulating creative thinking • discovering one's own emotions through art • breaking down one's own barriers • sensitisation to art • awakening awareness for the arts: theatre, painting, music

RISKS AND SUGGESTED SOLUTIONS	RISKS • the difficulty of quickly replacing an absent group member so that the whole group can continue to work (taking over some of the tasks and being flexible on the project) • within the group, not all people may be willing to take part in the staging (being on stage), so it will be necessary to find suitable tasks for them to undertake (e.g. music, set design, photography) in the project. SUGGESTED SOLUTIONS • instead of the works of J. Malczewski, each country can choose a painter who is suitable for it • the implementation does not have to be confined to the classroom space, the project can take place outdoors • by creating an account, a scrapbook of the project, pupils can use the language skills of their own country as well as other languages they are learning.

SCENARIO FUTURES LITERACY

PART 1. OF SCENARIO

TITLE	Futures Literacy
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	emotional intelligence, psychology, creative Learning
TYPE	*larger educational project*
DURATION OF CLASSES	3 lessons x 60 minutes
AGE OF STUDENTS	13-18

PART 2. OF SCENARIO

AIM OF CLASSES	The Australian philosopher Roman Krznaric wrote in his book 'The Good Ancestor: How to Think Long Term in a Short Term World' that "we are treating the future like a distant colonial outpost devoid of people, where we can freely dump ecological degradation, technological risk, nuclear waste and public debt". It's true that people avoid taking precautions to create a better future not only for themselves but also for future generations. **How can we be good ancestors?** Have we ever question ourselves about that statement? Maybe, not. However, it is never too late! The present educational project introduces to secondary students the innovative concept of "Futures Literacy". Futures Literacy, according to UNESCO, **is a skill that can be acquired and developed, which allows students to better understand the role of the future in what they see and do.** Students can cultivate their creative and critical thinking skills, imagine, design and influence the future. Under this scope, the lessons offered in the present educational project aim at help students to become more skilled at "using the future" more effectively and efficiently, to become more "future literate", because humans by nature are able to learn to imagine the future for different reasons and in different ways. **Futures Literacy is based on the unique human intellectual capacity of imagination.** By learning to imagine different futures, one can understand the ability to invent new assumptions about the future and ultimately influence it. When this process is consciously carried out, one begins to master the skill of Futures Literacy. Futures Literacy lessons will prove to expand creativity and innovation both in the school environment and in students' personal and professional development.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • learn how to decolonize the future • improve their capabilities to use and imagine multiple futures for different purposes and contexts • enable themselves to understand the sources of their fears and hopesq • create their own images of the future • discover new possibilities for innovation and resilience • address a wide range of challenges (e.g., societal, personal, professional etc.)
	IN THE FIELD OF SKILLS	Students can gain a number of useful skills and competencies such as: • synthesizing information • developing arguments • problem solving • critical thinking • discovering what people value • realizing the existence of diverse opinions and views • paying attention and actively listen to their classmates • sharing their thoughts and emotions • understanding and following the instructions • reflecting on a story • collaborating to creating stories • enjoying the process of playing
	IN THE FIELD OF SOCIAL COMPETENCES	By engaging with futures literacy students can: • develop their creative and innovative thinking • become truly resilient in an everchanging and complex environment • focus on a task, while working in a team • develop class community • develop teamwork • develop a sense of sharing (e.g., ideas and opinions) • minimize egocentrism

		• provide thoughtful interaction with their peers • learn how to collaborate
TEACHING METHODS	The teaching methodologies that are used in the Future Literacy Project are the followings: **QUESTION- ASKING**: Teachers ask questions to discover what the students have understood and misunderstood, to stimulate the students' thinking and to invite the students into a joint conversation. **FACILITATING LEARNING**: The teacher's role becomes that of a facilitator and organiser, providing resources and support to learners. In turn the participants learn with and from each other as they identify and implement solutions to (future) challenges, problems or other developmental issues. They might also set their own objectives and be responsible for learning assessment. **COMPARISON & CONTRAST**: This method engages students in delineating, differentiating, and distinguishing information. The four connected strategies for Comparison and Contrast are comparing, classifying, creating analogies, and creating metaphors. When using Comparison and Contrast, the teacher models how to analyze, qualify, and organize subtle and significant similarities or differences. Students identify similarities and/or differences between two or more items in order to understand how they are alike, equal, or analogous to each other	
SUGGESTED TEACHING TOOLS / MATERIALS NEEDED	The design of the educational project requires the following tools/materials to be used during the implementation: • Trend Cards • Game Cards • Worksheets (Quiz) • Video However, there is space to apply additional teaching tools and material to further enhance the designed activities. Some of them are: • PowerPoint presentations • Ted Talks • Documentaries • Books	
PRELIMINARY CONDITIONS (if applicable)	Not applicable	

TIPS / METHODO-LOGICAL REMARKS	• Tip #1: Be interactive, ask questions, use body expression and make eye contact with each of your students to emphasize what is important. • Tip #2: Ask questions that encourage an extended response or at least a "content" answer. • Tip #3: Listen carefully to your students and what they think for the future and provide reflection on them. • Tip #4: Offer guidance through acting more as a facilitator and less as a conventional teacher. • Tip #5: Remember facilitation is not delivery of content. • Tip #6: Use storytelling to trigger students imagination and capture their attention. • Tip #7: Use examples to inspire student's creative and critical thinking.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**CAN WE REFLECT AND INFLUENCE THE FUTURE? - THE POWER OF FUTURES LITERACY** Duration: 60' Lesson 1 aims to introduce students the importance of Futures Literacy in the 21st century. -What is Futures Literacy? -Why is Futures Literacy important? These are some of the fundamental questions that students seek to explore and get to know. The learning experience of students on that particular and, at the same time, challenging topic, is going to be enhanced by the interactive activity offered, which has been designed to guide students to notice current trends that may affect the future and to imagine if these trends continue to exist. Teaching tools: stationery, trend cards **GLANCES TO THE FUTURE** Duration: 60' When we hear the word "Future," what do we think? What comes to mind? What is going to happen in the next minute, day, week, year, 10 years or 500 years from now? The future is all of that! Lesson 2 aims to help students contemplate the future to better understand what might happen, how to prepare for it, and how each of us could affect it. Students will understand the different ways in which people, namely their classmates, perceive the future. In Lesson 2, students are asked to design how they imagine the future 20 years from now. They will fill in a quiz which will help them understand their own views of the future and then reflect on the future results.

LEARNING CONTENT - DETAILED CHARACTERISTICS	Teaching tools: stationery CREATING OUR OWN STORY Duration: 60' Lesson 3 aims to encourage students to create a story for the future! In particular, students are invited to play a game that will let them thinking about the future and trigger their imagination towards it. Teaching tools: stationery, game cards	
BASIC TERMS	futures literacy, future, creativity, trends	
STRUCTURE	LESSON 1 - CAN WE REFLECT AND INFLUENCE THE FUTURE? - THE POWER OF FUTURES LITERACY	**STEP 1** As an introductory stage, the teacher presents to students 2 future vision videos. 1. SMART TECHNOLOGY 2. HOTELS OF THE FUTURE **STEP 2** With regards to the 1st video, the teacher asks students the following question: "How will smart technology change our daily lives, entertainment, work, and relationships?" With regards to the 2nd video, the teacher asks students the following question: "Given that hotels of the future will operate in such way, would you miss the people?" **STEP 3** "Prevention is better than cure" Starting with that phrase, the teacher introduces to students the importance of Futures Literacy for the 21st century by reading the following extract from the UNESCO website. **"What is Futures Literacy (FL)?** FL is a capability. It is the skill that allows people to better understand the role of the future in what they see and do. Being futures literate empowers the imagination, enhances our ability to prepare, recover and invent as changes occur. The term Futures Literacy mimics the idea of reading and writing literacy because it is a skill that everyone can and should acquire. And it is a skill that is within everyone's reach. People can become more skilled at 'using-the-future', more 'futures literate', because of two facts.

		One is that the future does not yet exist, it can only be imagined. Two is that humans have the ability to imagine. As a result, humans are able to learn to imagine the future for different reasons and in different ways. Thereby becoming more 'futures literate'. **Why is Futures Literacy important?** The future is uncertain. Climate change, pandemics, economic crisis, social exclusion, racism, the oppression of women, inter-generational conflict, and more, shatter the conventional images of the future that humans use to plan, to feel secure, to be confident enough to invest in tomorrow. This is not a small problem. Without images of the future that inspire hope and foster collaboration there is a high risk of despair and war. The malaise of poverty-of-the-imagination must be overcome. The question is how? Futures Literacy is such a change. And it is happening now because the old ways of 'using-the-future' are no longer adequate given changes in both humanity's aspirations and tool enhanced capabilities. We want and can do more than ever before. But as always this depends on being able to do so. Futures Literacy addresses the urgent need to transform human governance by empowering everyone to use-the-future more effectively and efficiently. This is not just about understanding how to prepare for potential crises or plan how to overcome grand challenges or realise the important goals of Agenda 2030. It is about moving beyond a dependency on the illusion of certainty and the fragilities this creates." Upon the end of the reading, the teacher proceeds to a brief sum up, mentioning that Futures Literacy constitutes a "**universally accessible skill**" that all today global citizens need to have. It is the skill that allows people to better understand the role of the future in what they see and do. Being futures literate empowers the imagination, innovation, creative and critical thinking. STEP 4 The teacher split the students into groups of 4 or 6. STEP 5 The teacher distributes to each group 1 card with existing trends, requesting them to **think creatively**. Upon the distribution of cards, the teacher asks the following question to students: "Imagine this trend continuing over the next 10 years. How does this development have made the future different from the present?"

		STEP 6 The teacher asks students to choose a trend according to their preference and write a story about a possible future with regards to that trend. That exercise is great for students in order to show proactiveness, cultivate their creativity, and critical thinking as well as strengthen their problem-solving skills on future issues to come. NOTE: For more students, more cards have to be created following the same direction.
	LESSON 2- GLANCES TO THE FUTURE	STEP 1 The teacher asks students to imagine they are traveling through a time machine 20 years into the future. "What do you see?" There is no wrong answer. The future doesn't exist yet, therefore you can't know what's wrong and what is right. Upon posing the aforementioned question, the teacher requests students to find their own way to show what they think the future 20 years from now will be like. The teacher asks students to draw a picture or write a story. (10 minutes) STEP 2 The teacher asks students to compare what they have created with the picture or the story of a classmate. The teacher asks "What similarities or important differences you find in the way you perceive the future?" (10 minutes) STEP 3 The teacher asks students to think about the perspective of the future have and compare it with the perspectives of their classmates. (5 minutes) STEP 4 The teacher says to students: "according to the previous activity, it is well expressed that each of us perceives the future differently. That's a good thing, yet useful, because it gives us the opportunity to learn from others and their ideas in order to think in new ways. We all make assumptions, based on which we perceive the future.". Then, the teacher distributes to students a quiz, allowing them to express their views on that statement. (10 minutes)

		STEP 5 The teacher poses to students the following question, asking them to write in a piece of paper their view. (10 minutes) "How your view of the future can serve you as you grow up and make decisions?" STEP 6 The teacher asks students the following question, requesting them to answer them in a piece of paper. (10 minutes) "Choose a perspective different from your own. Justify how this perspective could would help you when contemplating the future."
	LESSON 3 - CREATING OUR OWN STORY	STEP 1 The teacher distributes to students 5 types of cards. The teacher asks students to read what the 5 types of cards indicate and get familiar with the game. The cards indicate the **CATEGORY** according to which the story will be made, the **YEAR** in which it will happen, the **THEMATIC CATEGORY** in which the story will take place, the **CHANGE** that will occur in order to to shape the future and the **PERSON** or/and **LOCATION** that will be the focus of the story. 1. **Category Cards**: this type of cards indicates what kind of story students will create, e.g. if a story is funny, scary, creative, more likely to happen etc. 2. **Time Cards**: this type of cards indicates the time frame in which the story will take place, e.g. whether the story will be set in the year 2025 or 2050. 3. **Thematic Cards**: this type of cards indicates the thematic framework in which students will need to set their story. 4. **Cards of Change**: this type of cards indicates a change that affects the future of students' story. 5. **Cards of People & Places**: this type of cards indicates people or places for students to include in their story. STEP 2 The teacher speads the cards on a desk and defines a Leader. The Leader will be in charge of choosing the winner of the round. STEP 3 The teacher asks students to choose one card from each of the 5 types.

		STEP 4 The teacher asks students to write in a piece of paper a story using all the information included in the cards chosen. **STEP 5** Students read loudly their stories and the Leader decides which one is more relevant to the CATEGORY had been selected, e.g., did the story was enough funny, given that the student has chosen the category card which mentioned "The most funny"? **STEP 6** The Winner assumes the role of Leader and the next round begins. NOTE: For more students, more cards have to be created following the same direction.

PART 4. OF SCENARIO

BENEFITS	The benefits arising from teaching Futures Literacy in the classroom have been identified, as follows: • empower the imagination of students • enhance students' ability to prepare, recover and invent as changes occur • enable students to more fully appreciate the diversity of both the world around them and the choices they make • improve students' ability to harness the power of images of the future • assist students to identify the diverse choices that can lead to different consequences
RISKS AND SUGGESTED SOLUTIONS	Teaching about Futures Literacy, apart from allowing students to better understand the role of the future in what they see and do, can also hide risks that should be identified prior to the beginning of the educational project. Below, a number of potential risks that might affect the smooth flow of the lessons are presented: • reduced reflexivity of students regarding different attitudes towards the future • the distance that can emerge between theoretical models and the outside world • poor collaboration between students To deal with these challenges, the following suggestions may be taken into account: • capture students' imagination • be well aware of the theoretical models • emphasizing the important values of team building and teamwork • act as a facilitator rather than an instructor/teacher. • think creatively and innovatively • use imagination • promote the good values arising from visualizing the future (prevention is better than cure!)

TREND 1	Netflix subscribers are growing. Imagine this trend continuing over the next 10 years. How does this development have made the future different from the present?
TREND 2	Movie ticket sales are reducing. Imagine this trend continuing over the next 10 years. How does this development have made the future different from the present?

TREND 3	The number of working women is rising. Imagine this trend continuing over the next 10 years. How does this development have made the future different from the present?
TREND 4	The role of social media in politics is growing. Imagine this trend continuing over the next 10 years. How does this development have made the future different from the present?

Lesson 2

Quiz

See the statements below. Check the box next to the statement that expresses you the most. Remember that there is no right or wrong answer.

-
- The future is predetermined
- The future holds many opportunities and is not predetermined
- We have no significant influence on an individual level in shaping the future
- We have significant influence on an individual level in shaping the future

CATEGORY	The most creative
CATEGORY	The most funny
CATEGORY	The most scary
CATEGORY	The most likely to happen

YEAR	2030
YEAR	2060
YEAR	2085
YEAR	2100

THEMATIC CATEGORY	Society (demographics, culture, heritage, rituals)
THEMATIC CATEGORY	Technology (inventions, digital devices, innovation)
THEMATIC CATEGORY	Economy (work, business, trade)
THEMATIC CATEGORY	Environment (nature, climate, animals)

CHANGE	The number of people who do recycling is increasing.
CHANGE	The personal information that people share online is increasing.
CHANGE	The number of people living in big cities is increasing.
CHANGE	How have businesses changed since the global financial crisis?

PERSON / LOCATION	Scientists
PERSON / LOCATION	Parks
PERSON / LOCATION	Schools
PERSON / LOCATION	Moon

HISTORICAL REENACTMENT

PART 1. OF SCENARIO

TITLE	Historical Reenactment
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	Humanities., teatrical studies, ICT, sciences, art
TYPE	Educational Project Historical Reenactement constitutes a supportive and complementary educational project to history classes included in the school curriculum. It addresses to teachers of secondary schools, educators and methodological centres staff.
DURATION OF CLASSES	4 Lessons x 90 minutes
AGE OF STUDENTS	Students between the ages of 13-18

PART 2. OF SCENARIO

AIM OF CLASSES	Reading textbooks, writing essays and tests is not the only way to learn about history, particularly when we address children and not adults. Given that history is considered one of the most demanding and challenging subjects within the school curriculum, due to the existence of complicated and detailed historical topics, contemporary educational systems have started embedded in their teaching methods reenactments of major historical events, such as historical battles and wars, as a way of **transforming learning history into an easy, funny, creative and interactive process for students**. According to Español-Solana and Franco-Calvo (2021, p.1) "historical reenactment is becoming a top-tier teaching tool in the countries of Southern Europe." Historical reenactment lessons will prove to constitute an innovative experiential learning tool for teachers/educators aiming to expand students' knowledge and understanding of history. "**Show, don't tell**" is a statement that is totally in accordance with the present educational scenario and its objectives.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • deconstruct historical complexities • understand more easily difficult historical concepts and events • gain deeper meanings and understandings of historical events and scenes • have a long-lasting historical learning (easily recall of historical events and important information retrieval) visualization of history
	IN THE FIELD OF SKILLS	Students can gain a number of useful skills and competencies such as: • synthesizing information • developing arguments • recreating artifacts • problem solving • critical thinking • role-playing • discovering what people value at a given point in time • participating in recreated historical events
	IN THE FIELD OF SOCIAL COMPETENCES	By engaging with historical reenactment students can: • develop class community • develop teamwork • develop a sense of sharing (e.g., ideas and opinions) • minimize egocentrism • provide thoughtful interaction with their peers • learn how to collaborate • become more responsible for their own learning

TEACHING METHODS	Transforming learning history into a vivid and creative process for students can not be achieved without **interactive/participative/experiential teaching methods**. Those methods are the ones that can contribute greatly to creating memorable experiences for students and in turn make history learning has long-lasting effects. Making history come alive can not be materialized in practice without students' active: • engagement • involvement • participation • interaction • contribution That means, from a teacher-directed approach, which used to be a prevailed method in the past, we turned into a student-centred approach. To start reenacting the past and exploiting at the maximum its benefits, students should be taught, on a basic level, how to: • deconstruct historical complexities • think critically • research • observe • synthesize information • make a judge • solve a problem • play a role Hands-on skills are also important in participating in a recreated historical event. Some skills to be taught and developed are, but not limited to: • recreating artifacts • playing music • creating scenery • producing sounds (physically or/and digitally use of ICT skills) All these "tangible" skills can undoubtedly increase students' excitement to learn history (the goal has been achieved!).
SUGGESTED TEACHING TOOLS / MATERIALS NEEDED	For the successful hosting of a historical reenactment the following basic materials are recommended: • clothing, uniforms, costumes • scenery • audio material (e.g., sounds of war) • scripts or texts

	Historical reenactments are characterized by great flexibility (International Journal of Social Education 2008, pp. 2, 7). Depending on the school location each time, historical reenactments apart from taking place inside the classroom can also be conducted outdoor; in nature. When that occurs, reenactments can take advantage of natural resources (e.g., the trees, the caves etc.), which can play the role of scenery.
PRELIMINARY CONDITIONS (if applicable)	As far as Historical reenactment constitutes a supportive and complementary educational project to history classes included in the school curriculum, it is a prerequisite for students to have attended all the appropriate history lessons on which the reenactment will be based. In addition, aiming to historical events come alive in the classroom, it would be useful for students to have attended some art, science, and music lessons in case they will have to produce a sound, create scenery or/and reproduce a process (e.g., how to make cheese), which is considered an essential part for reproducing a particular scene. Furthermore, by attending a series of theatrical lessons, students can learn some basic acting skills, which can be proved beneficial for role-playing and eventually for long-lasting historical learning (e.g., skills on how to effectively memorize historical details). Finally, historical reenactments lessons' constitute a great opportunity to indicate to students that school subjects do not stand independently but they are strongly related to each other depending on the perspectives we approach them each time; in other words, that is we call as an **interdisciplinary teaching method**.
TIPS / METHODOLOGICAL REMARKS	It is well established that by reenacting the past we understand it better. Given that students have few understandings of the past due to their limited number of experiences, reenactment of historical events is considered an **innovative approach** to expanding their knowledge and understanding of history.

PART 3 OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Conceptualizing Historical Reenactment** It is of paramount importance to give students a brief introduction of the new emerging experiential teaching "tool" entitled historical reenactment. Acknowledging that history is considered among the most demanding – and sometimes boring school subjects, it is essential, early from the beginning of the lesson, to make students aware of the great benefits that historical reenactments have on their understanding of history. Special attention should be paid on the fact that apart from a supportive educational project to history classes, historical reenactment transforms learning history into an easy, funny, creative, and interactive educational process. In what follows, some fundamental questions to be answered by teachers to students are presented: • What's its innovative aspect as opposed to the traditional learning of history? • What gaps of traditional learning historical reenactment will bridge? • How can reenactment contribute significantly to long-lasting historical learning? **Ancient Egyptian Mummy Reenactment** After presenting a theoretical background of what does constitute historical reenactment, it is time to give concrete examples based on history books and classical texts. As well mentioned earlier, textbooks constitute the primary source from where students can start learning history. Historical reenactment transforms learning history from a merely theoretical subject into an interactive and experiential educational tool. Choosing from the school curriculum history books' a historical event, scene or time period of high significance – it is a prerequisite to have earlier made all the appropriate research on the investigated topic. Given that Ancient Egypt and Egyptian mummies are included in almost all history books, it is a great opportunity for students to learn about the Egyptian civilization through a fun and interactive ancient egyptian mummy reenactment activity. To prepare for this lesson, teachers need to create and print cards with images of typical Egyptian burial goods and items (e.g. vessels, pots, jewellery) as well as cards with random images. They also need to tear or cut strips of fabric to wrap the "mummy" for a more authentic experience. **Reviving Odyssey: The Sirens, Scylla and Charybdis** Undoubtedly, Odyssey is one of two major ancient Greek epic poems attributed to Homer, embedded in many secondary school curriculums. Have we ever thought how digestible is Homer in the age between 13 and 18? The answer is not easily digestible. This lesson will concentrate on one scene of the famous Odyssey and in particular on the scene when Odysseus, during his journey back to Ithaca, entered the Hades and meet the Sirens, Scylla and Charybdis.

	Summary of the scene: Leaving Hades, Odysseus and his companions reached the island of the Sirens. They charmed the sailors with their sweet song and when they came near, they ate them. But Odysseus, as Circe had advised him, covered his companions' ears with wax, so that they should hear nothing, and ordered them to tie him tightly to the mast of his ship. As he approached the Sirens, he was enchanted by their sweet song, and begged his companions to untie him. But they tied him tighter, until they pulled away and the song of the Sirens could no longer be heard. They approached after the strait of Scylla and Charybdis. From one part of the strait the Charybdis sucked in the sea water and drowned the ships. They didn't go near it and were spared. But from the other side Scylla, curled up in her cave, stretched out her six terrible heads, seized six companions and ate them. They went weeping through the terrible strait and found themselves on the open sea. To prepare for this lesson, teachers need to create a script for the scene. They also need to find costumes in order to help students live the scene in depth. That historical reenactment activity is highly recommended to be conducted outdoor, in nature in order to take advantage of natural resources (e.g., the trees, the caves etc.), which can play the role of scenery. **French Revolution** The history of the French Revolution still offers important lessons: that civic courage is a virtue, that ideas do make a difference, and that, as for the men, and women, of 1789, all things can be possible in the lives, and education, of our students today. Due to its historical significance, which is down to the present day, French Revolution has been embedded in many school history books. By reenacting the French Revolution, students will be able to deconstruct complicated details and facts, understanding in a funny and creative way such an important historical event in world history. Summary of the event: The French Revolution was a watershed event in modern European history that began in 1789 and ended in the late 1790s with the ascent of Napoleon Bonaparte. During this period, French citizens razed and redesigned their country's political landscape, uprooting centuries-old institutions such as absolute monarchy and the feudal system. The upheaval was caused by widespread discontent with the French monarchy and the poor economic policies of King Louis XVI, who met his death by guillotine, as did his wife Marie Antoinette. Although it failed to achieve all of its goals and at times degenerated into a chaotic bloodbath, the French Revolution played a critical role in shaping modern nations by showing the world the power inherent in the will of the people. Read more HERE
BASIC TERMS	Historical reenactment; experiential learning; interaction; hands-on experience

STRUCTURE	LESSON 1 - Conceptualizing Historical Reenactment	STEP 1 Familiarizing students with the idea of historical reenactment (a prerequisite for that is a review and deconstruction of relevant bibliography. Making an interactive PPT with key concepts is higly recommended). STEP 2 Explaining to students the learning benefits of that subject (attempt to put emphasis on the fact that history learning becomes an easy and funny process with long-lasting effects – no learning pressure anymore just learning through play!). STEP 3 Presenting a video to give an audiovisual idea of what historical reenactments are about (you can take some ideas from the recommended following videos: https://bit.ly/3Fbh4KV , https://bit.ly/3tfqh9z , https://bit.ly/3qhWKDH) **a picture, and in our case, a video is worth a thousand words!**
	LESSON 2 - Ancient Egyptian Mummy Reenactment	STEP 1 Teacher presents to students a video about Ancient Egypt, including references to Egyptian mummies. That can be approached as the preliminary/introductory stage of the lesson. STEP 2 Teacher presents various concepts and asks students about their meaning. (Egypt / Egyptian rituals / mummies / pharaohs / religion) STEP 3 After a group discussion the concepts and their meanings are registered. STEP 4 Teacher distributes roles to students. Some of them will take the role of the deceased pharaoh and some other the role of priests and embalmers; all of them will participate in the mummy reenactment activity. During that stage, questions may arise so be proactive and ready to answer them! STEP 5 Teacher will have prepared in advance and will distribute to students cards with images of typical Egyptian burial goods and items (e.g. vessels, pots, jewellery) as well as cards with random images. STEP 6 Based on the script that will have been developed in advance, teacher will guide students on how to mummify the pharaoh. Students who will pretend the embalmers will be in charge of putting the right burial items close to the pharaoh.

		STEP 7 During the mummification process, teacher will start narrating key points, such as: • the importance of mummification for Egyptians • the relation between mummification and Egyptian religion • the underlying meanings behind the mummification process **STEP 8** Teacher will give homework to students. In particular, it will be requested to video recording themselves, narrating what they did in that particular lesson. How did the lesson begin? What was next? What did enjoy most?
	LESSON 3 - Reviving Odyssey: The Sirens, Scylla and Charybdis	**STEP 1** Teachers presents to students a video of the famous scene. You can take some ideas from the recommended following video: https://bit.ly/3KUP7uR **STEP 2** Teacher asks introductory questions to students based on the video they watched. In particular: Who were the Sirens and what happened on their island? Who were Scylla and Charybdis and what happened when Odysseus passed through their alley? **STEP 3** Teacher raises critical underlying points for discussion, which are closely related to the facts of the scene, such as "Sirens, Scylla and Charybdis symbolize travel, the sea and embody the human fear of unknown territories." Teachers need make students aware that the Sirens, Scylla and Charybdis does not constitute just a scene, but it encloses many meanings messages, which need to be decoded and deconstructed. **STEP 4** Teacher distributes roles to students and request them to put on their customes. During that stage, questions may arise so be proactive and ready to answer them! **STEP 5** Based on the script that will have been developed in advance, teacher will guide students on how to play the scene. You can take some ideas from other related reenactments performed by students in the following video: https://bit.ly/3xq11ym,

		STEP 6 Students will be requested to express their opinions and feelings from that reenactment activity.
	LESSON 4 – French Revolution	**STEP 1** The teacher presents a short video to students, which contains all the essential historical information about the French Revolution. The video under the title 'The French Revolution In A Nutshell' is available on YouTube **STEP 2** In teams of four or six,students are requested to make the well known Phrygian caps, which were the symbol of revolutionary France, representing freedom and liberty. Watch 'How to make your own Liberty Cap | The secret symbol of freedom in the 18th century | NMLRA' on YouTube **STEP 3** The teacher distributes a worksheet to students, requesting to identify the figures included. The figures are the most important leaders of the French Revolution. - EMMANUEL JOSEPH SIEYÈS - HONORÉ GABRIEL RIQUETI - GILBERT DU MOTIER - JEAN-PAUL MARAT - JACQUES PIERRE BRISSOT - MAXIMILIEN ROBESPIERRE - LOUIS ANTOINE DE SAINT-JUST - GEORGES DANTON - LAZARE CARNOT - NAPOLEON BONAPARTE **STEP 4** The teacher distributes roles and the related script to students. **STEP 5** The teacher directs the action in this section. Let the Reenactment Commence! **STEP 6** After the completion of the reenactment, the teacher pose some reflection questions to students in order to trigger their memory and develop their critical thinking.

		Some questions are proposed as follows: 1. What caused the French Revolution? 2. Who led the French Revolution ? 3. Why the notion of 'equality' is closely related to the French Revolution? 4. How did the French Revolution change the development of the new society? 5. What do you think your team could have done differently to win?

PART 3 OF SCENARIO

BENEFITS	Deconstructing and understanding history can be proved a challenging task, given the complexities and massive information included in that particular school subject. Historical reenactments can constribute significantly in **simplifying major events, time-periods and scenes, decoding complex and challenging meanings** assisting students to learn and, simultaneously, experience history. Detailed benefits are presented in the learning outcomes' section.
RISKS AND SUGGESTED SOLUTIONS	Reviving the past, apart from capturing students' imagination and creating enthusiasm, can also hide risks that should be identified prior to the beginning of the lesson. Below, a number of potential risks that might affect the smooth flow of the lesson are presented: • lack of accuracy on historical information • possible injury during the reenactment • poor collaboration between students • incongruity of the twentieth-first century surroundings with those of the past In order to manage the above possible risks, some suggested solutions follow: • cross-checking the credibility of the sources • safety instructions reminders • emphasizing the important values of team building and teamwork • recreating simple scenery to resemble those of the past strengthening students' hands-on skills (e.g., artistic skills, technological skills, scientific skills etc.)

E-CULTURAL HERITAGES

PART 1. OF SCENARIO

TITLE	E-Cultural Heritages
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	Technology and Design, Social Sciences, English
TYPE	*larger educational project*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	15-18

PART 2. OF SCENARIO

AIM OF CLASSES	• To familiarize students with different tangible and intangible cultural heritages. • To make students aware of concepts coming from the past to today about cultural values. • To present students how the culture affects people's way of life and taste of art. • To train students in the use of digital tools in education. Each heritage will be integrated into some digital tools. Some games, puzzles, and virtual exhibitions will be created.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • Describe tangible and intangible heritages. • Become aware of cultural heritages. • Understand the importance of protecting and transferring them to the next generations. • Find and identify attitudes, emotions, viewpoints and intentions of cultural heritages • Expand their vocabulary (cultures, diversity, different disciplines like history, geography, technology and design...) • Extend their digital knowledge • Act as an active learner producing his own works and materials

	IN THE FIELD OF SKILLS	Students can: • Create a Google Earth Web collaborative project with augmented reality technology with their groups, and it will increase their creativity and innovation skills. Creativity and Innovation • Use Google Earth Web, QR Code Generator, Europeana and Jamboard to create learning material, which develops their digital literacy. ICT Literacy • Discuss what is the important information, images and links to put in Google Earth Web Project and try to solve ICT problems together. **Critical Thinking and Problem Solving** • Have new products that will improve their productivity skills.Productivity & Accountability
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: • Share at the end, with the entire class, their thoughts about problems that occurred, and how they had solved them and display an online Google Earth Web project to the class (and school, and school community). - Communication • Work with groups of two elements- Collaboration • Participate in a collaborative project, it will contribute to developing their responsibility.

TEACHING METHODS	• Collaborative Learning: a strong focus on group work. • Cloud Based Learning: data, tools, software is all online and can be reached and modified from different devices. • Mobile Learning: we get access to knowledge through smartphones and tablets. It is learning anytime, anywhere. • Bring Your Own Devices (BYOD): Students bring their own mobile devices to the classroom. • Augmented Reality: by pointing devices like smartphones and tablets to objects of reality you receive extra information. • Learning materials: shift from textbooks to web resources and open-source books. • Visual Search & Learning: images and multimedia are more powerful than verbal stimuli.
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Platforms and tools: Padlet, thinglink, Google Earth Web, Canva , qr code generator, joomag. *Pc, Internet, smartphone/tablet, paper, pen*
PRELIMINARY CONDITIONS (if applicable)	*Most of the lessons may take place in a computer laboratory if students do not have smartphones or tablets.*
TIPS / METHODOLOGICAL REMARKS	• Act as a "resource" to students, answering questions and reviewing their progress as needed. • Play a passive role in student's learning; students are active and engaged participants in their learning. • Listen carefully to your students and follow their findings and provide reflection on them. • Guide students not to choose the same images or places for thinglink and google earth web activities. • Guide students through acting more as a facilitator and less as a conventional teacher.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Technology and Design**: Students use thinglink, Google Earth Web (GEW) joomag, qr code generator to create their own content. **Humanities**: English, history, art history. **Social Sciences**: Geography area/ethnic studies (cultural values) are learnt. **English**: Vocabulary of heritages, maps, geography, art, architecture, museums, war are learnt.

BASIC TERMS	Cultural heritages, tangible, intangible, diversity, art, digital technology	
STRUC-TURE	LESSON 1	**STEP 1 Brainstorming (10')** Teacher shares this padlet link with students: https://padlet.com/projectcreatingspaces/tvntdgb0lpkj48jv Students answer these questions and upload the images they found on the internet. What is tangible heritage?What is intangible heritage? Do you think that tangible and intangible cultural heritages are important to describe a country's cultural background? Do you know any cultural heritages at risk? What can we do to make them live longer? **STEP 2 Sharing is Caring (20')** With digital tools and technology, we can make the experience of art and culture even more powerful. Bringing cultural heritage to the digital sphere gives more people greater access. Teacher makes a presentation to introduce some digital tools like; Google Earth Web (GEW) https://youtu.be/5KtwMRedAbc (2.50') thinglink, joomag, qr code generator. **STEP 3 Europeana** Then ,the teacher introduces the Europeana to the students and invites the students to explore the results from the research on Europeana. Next, students are encouraged to try out these tools and platforms. Teacher tells students that they will create their own virtual museum in groups of 4. During the next lesson. They need to gather some content and information first (check Europeana). And then they will use www.thinglink.com to work on the museum.
	LESSON 2	**STEP 1 Surfing on Europeana (10')** Teacher demands students to make a search on Europeana to find a museum which they would like to visit. They may look for and upload some information at the link below: https://museums.eu/ or some pictures from this link: https://unsplash.com/ **STEP 2 Thinglink (25')** Students use thinglink to make their own virtual museum. They watch these tutorial videos to learn how to register and use the site. https://www.thinglink.com/learning-center **(11.25')** https://youtu.be/2HL3qT96epk **(10.00') (use one of them)** Then they start working on the website and create their own museum in groups. If they can not complete this task during the lesson, they can do this at home and share the link with the teacher.

	LESSON 3	**STEP 1 Heritage at risk (10')** Teacher explains to students the importance of protecting and preserving endangered cultural heritages around us and in the world. To increase some awareness this activity will be done on heritages at risk. The recent devastating events at Notre-Dame, the National Museum of Brazil and across Syria remind us that cultural heritage is at constant risk, as much today as throughout history. During this critical time,Ukraine's heritage is now at risk and the work to promote our shared values and goals will be more important than ever. Asks students their thoughts about lost heritages in Ukraine and what can be done to **STEP 2 Look for relevant information (35')** Groups will search for and select relevant images and information about the cultural heritage at risk they have chosen, on Europeana and, if necessary, on the Unsplash website. https://www.europeana.eu/en/exhibitions/heritage-at-risk or from https://unsplash.com/ https://www.europeana.eu/en Some of these images and information will be placed directly on Google Earth Web (GEW) and others will be transformed into QR Codes https://www.the-qrcode-generator.com/https://youtu.be/c1q50z57Xc8 (tutorial video 1.20'), which will later be placed in the GEW Project.
	LESSON 4	**STEP 1 We are creatives (35')** Students create files with small texts and images or just texts about the cultural heritage at risk they are studying and with the QR Code generator they will transform them. Then they work on Google Earth Web and use their creativity to organize the images, information and QR Codes in the GEW project markers. Thanks to qr codes, we can see the information they added when we point our cell phones at the Google Earth Web. **STEP 2 Reflection (10')** Each group presents their marker at GEW to the others. Each student reflects on his group's work and other groups' works and writes his thoughts using a jamboard. They also discuss the difficulties they encounter and how they overcome them, the things they learn from

PART 3 OF SCENARIO

BENEFITS	Awareness of the importance of cultural heritage will be raised in students' minds. They will understand the importance of preservation of heritage as the grown-up of the future. Working in a collaborative, using digital tools, students will enjoy learning activities and they will become active learners which is a necessity for life-long-learning.
RISKS AND SUGGESTED SOLUTIONS	Students may not complete their digital works at school. Teachers may let them finish their tasks at home, help them when they are at home and check their work for the next lesson.

A NEW JOURNEY

PART 1. OF SCENARIO

TITLE	A New Journey
MAIN SUBJECT	English
OTHER SUBJECTS/DISCIPLINES	Science, Technology, Art, Engineering
TYPE	*Single lesson/larger educational project/study visit/fieldwork*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	15-18

PART 2. OF SCENARIO

AIM OF CLASSES	• To attract students attention on aerospace/aviation concepts • To help them understand how things work related to flying, • To provide opportunities for students to create their own learning materials using their figment of imagination. • To make learning a foreign language (English) enjoyable within an interdisciplinary teaching atmosphere using many new methods like coding, design thinking, 3d producing, hand made designs,educational games. • To broaden the knowledge of how to fly. They design flying objects like hot air balloons, gliders, planes, rockets and spaceships. • To Engage students with science; they decide on a place to start a new life in space and build their house and other needed goods and food.	
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • Learn about the concept of AEROSPACES • Get information on how to design a flying object like gliders, hot air balloons, planes, spaceships. • Recall ideas on a new life on the moon/ Mars/ space. • Have space to make 3D design, encode an educational game and create a mind map. • Create puzzles, write acrostics to improve English concepts related to aerospaces

	IN THE FIELD OF SKILLS	Students can: • Improve their creative and critical thinking skills • Creative ability depends on creative thinking which is part hard work but largely creative problem-solving (Lobell, 2018). • Produce activities using digital tools like; kahoot game, canva, mentimeter,padlet, etc. • Involve in an enriched learning environment to promote their 21st century skills (curiosity and critical thinking, communication skills, collaboration,learning to learn) • *Lobell, K.O. 2018. What Is Creativity? Defining the Skill of the Future. Creative Live:* https://www.creativelive.com/blog/what-is-creativity/
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: • Take personal and social responsibility • Work collaboratively, exchange ideas with his friends • Respect and express appreciation for others. Being able to work well with others, present ideas and listen to others' ideas, and work and cooperate in heterogeneous groups.

TEACHING METHODS	• Project-based learning : students get fact-based tasks, problems to solve and they work in groups. This kind of learning usually transcends traditional subjects. • Lifelong learning: Students take roles in their own learning. Gain the ability to learn themselves. • Design Thinking : Students meet a problem-solving approach that has the intention to improve products. • Inquiry-Based Science Education (IBSE) • Collaborative learning, a strong focus on group work. • Game-based learning, • STEAM (ART) Learning (Science,Technology, Art, Engineering), • CLIL: This LS is meant to be used in English lessons with an emphasis on Content and Language Integrated Learning (CLIL) methods of teaching together with Science, Technology, ICT, English and Art as cross-curriculum approaches.
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Platforms and tools: Mentimeter, Padlet, Kahoot, Canva, Zoom, PowerPoint etc. Aviation education: how things fly https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/science-of-flight.html For Designing flying objects: Balloons, Audiovisual presentation equipment with access to the Internet. Student access to computers, smart phones, and/or tablets, and the Internet
PRELIMINARY CONDITIONS (if applicable)	*A flexible learning environment to design flying objects in groups would be nice.*
TIPS / METHODOLOGICAL REMARKS	• Since this is a STEAM work students will enjoy to be involved actively so act as a helper. • Demonstrate students how to access and comprehend information. • Let students learn through doing something themselves.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Science and Technology:** Providing pupils opportunities to teach themselves how to design flying objects and some other physics rules. **Engineering:** Understanding and identifying the aerospace concepts, and inducing students ability to design and think critically. **English:** Students learning English within a real time activity

BASIC TERMS	Aerospace, design thinking, 3d designs, learning English, flying	
STRUC-TURE	LESSON 1	**STEP 1 (20') Introduction** Teacher introduces aerospaces, gives its definition from the link given: ttps://en.wikipedia.org/wiki/Aerospace Then the teacher asks some questions to raise students' interest more. Would you like to fly? Have you ever tried to design a flying object (a glider, plane, helicopter, spacecraft etc.)?" Then teacher starts the video below: (11.53') https://www.youtube.com/watch?v=mz3hIJnR5F8 the teacher and the students speak and discuss the information. Teacher asks : ,Would you like to work as an aerospace engineer in future?" **STEP 2 (10') Mentimeter** Then a mentimeter word cloud activity is done on: https://www.mentimeter.com/ **(Annex 1)** **STEP 3 (15') How to fly** Teacher shares **annex 2** about the science of flight. School's physics teacher also gives students some scientific information about the physical rules of flying.
	LESSON 2	**STEP 1 (15') History of Flight** Teacher asks: ,What do you know about the history of flight?" Then the video ,The History of flight" (5.35') is watched and students exchange ideas about the new information. https://www.youtube.com/watch?v=HPEW4azMmKU **STEP 2 (20') The history of flight reading comprehension** After watching this video a reading activity is done and comprehension questions are answered .**Annex 2** https://www.eslprintables.com/reading_worksheets/history/The_history_of_flight_336526/ Students learn many vocabulary about flying, planes, gliders, propollers and hot air balloon. To reach more information about flying click here. https://www1.grc.nasa.gov/beginners-guide-to-aeronautics/newtons-laws-of-motion/ **STEP 3 (10') Experiment Time!** Hot air balloon experiment is done. Students work in groups. **Annex 3**

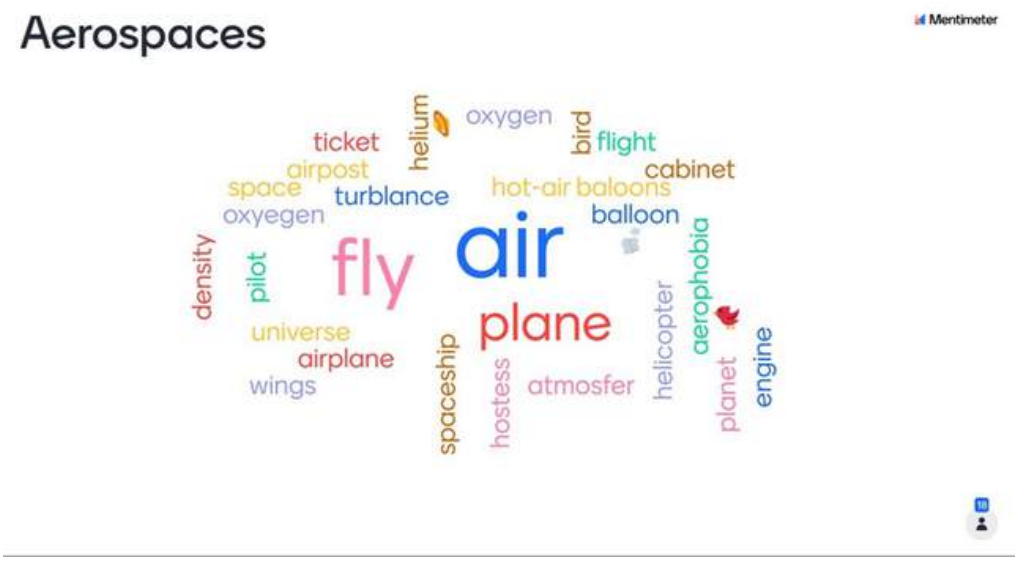
STRUC-TURE	LESSON 3	**STEP 1 (20')Reading Activity on Flying Frenchman** Another reading activity is done on French inventor Franky Zapata and his flyboard. His video of crossing the English channel is watched. Students learn more about different ways of flying. **Annex 5** : https://www.dailymail.co.uk/news/article-7319143/French-inventor-Franky-Zapata-person-successfully-cross-English-Channel.html **STEP 2 (25') Designing gliders/planes** Cooperating with an art teacher, students design and create their gliders and planes. **Annex 6.** Students, English and art teachers have a look at the link below to get an idea how to design a plane. https://www.instructables.com/teachers/howto/plane/ **!!! If you have a 3d printer at your school you can also do this activity !!!** Collaborate with a Technology teacher to design a spaceship on tinkercad. https://www.tinkercad.com/ Watch this video to learn how to design a plane on tinkercad. https://www.youtube.com/watch?v=541M5rS56Pw (10,38') Designed spaceship produced on 3d printer **Annex 7**
	LESSON 4	**STEP 1 (20') Space** Students watch the video How to fly in space at https://youtu.be/mQIXpsczN41 (1.31') : **Annex 8** A speaking and writing activity about where to live apart from Earth. A brainstorming activity is done to determine the Then the video below is watched. Best place to live on the moon (1.38') https://youtu.be/EjOgdBm1dqc Then another discussion takes place on how to live, how to build our houses, and what to take to this new house. Then a writing activity is done. **Annex 8** What materials to build your home on the moon? (1.20') is watched to compare our findings with the ones in video. https://youtu.be/2QpGXe85S31 Collaborating to Technology teacher scratch programs can be used to design the new journey and the life settlement in space/Mars/Moon etc. The speeches, feelings about the new settlement can be added. https://scratch.mit.edu/ **Step 2 Science Acrostics (15') Annex 9** Students work on science vocabulary acrostics as a production activity. **Step 3 Crossword puzzle (10')** Students may do some crossword puzzle activities from the link below. https://crosswordlabs.com/category/space?page=2

PART 3 OF SCENARIO

BENEFITS	*Remarks from teachers* *Art Teacher:* *" It was a fruitful cooperation and we learnt a lot about aerospaces together with our students"* *Technology Teacher:* *"We used many new and different methods. This was a way of edu+tainment to education with a fresh and interesting topic."* *English Teacher:* *" As our students are gifted and talented students, we always try hard to provide them with new and challenging topics and methods to increase their potential. Aerospaces in class project has been a really great guide and help to think out of the box both for teachers and students"*
RISKS AND SUGGESTED SOLUTIONS	**These assessments might be used to detect risks and find solutions.** Formative Assessment: The following questions can be asked to students: • What have I learned? Have I learned new things? • What did you see/dislike about the research/tasks, what would you do differently? • What will I do with what I have learned? And a kahoot game might be played.

ANNEXES:

ANNEX 1: WHAT COMES TO YOUR MIND ABOUT AEROSPACES?



ANNEX 2: WHAT COMES TO YOUR MIND ABOUT AEROSPACES?

The Science of Flight
The Science Behind it...

How do airplanes fly?

There are four forces that impact a plane's flight: Thrust, Lift, Gravity, and Drag. Planes can fly long and fast when all four of these forces are in balance. Lift is the force that gets the plane in the air; thrust is the force that keeps it moving forward. Drag is the force that slows it down, and gravity is the force that tries to bring it back down to the ground. Thrust and lift are the two forces that keep an airplane flying; drag and gravity are the two forces that work to shorten an airplane's flight.

Thrust - The force that pushes an airplane forward.
An airplane's thrust is a mechanical force generated by its engine or propeller. In a paper airplane, the thrust is generated by someone's arm throwing it.

Lift - The force that pushes an airplane up.
An airplane has specially designed wings called airfoils that move the air on the top of the wing faster than the air below the wing, creating higher pressure under the wing. Energy flows from higher to lower energy levels; the difference in pressures above and below the wing causes the upward force called lift.

Gravity - The force that pulls an airplane down.
Gravity is the force that pulls everything toward the center of the earth. The more massive an object is, the greater the force of gravity. Airplanes that are lighter will need less thrust and lift to go up and stay in the air. Adding weight at the rear of a plane will move the center of gravity aftward. (Note: As youth experiment it is important to know that the addition of paperclips may initially improve flight performance, but with enough paperclips, it will eventually make flight unstable.)

Drag - The force that pushes against an object.
Airplanes are designed long and skinny, with a pointed nose so that they can move through the air with reduced resistance, or drag. If an airplane had a wider surface it would have to push more air out of the way, requiring more energy, to move forward.

Materials
⇒ 8 ½" x 11 paper (1 per youth)
⇒ Paperclips (4-5 per youth)

Optional
⇒ Colored pencils/markers/crayons (to share)
⇒ Scissors (to share)
⇒ Stickers

Making and Exploring Further

Make activities encourage problem solving through trial and error, allowing for individual creativity and experimentation. Youth will ignite their curiosity and expand their critical thinking skills as they move from the planned and guided activity to an open exploration of different materials and methods.

- Encourage youth to make airplanes that are different designs and sizes.
- Encourage youth to test and compare flights with other household items such as paper towel or toilet paper rolls, paper plates, disposable

Sources
⇒ National Aeronautics and Space Administration: www.grc.nasa.gov/www/k-12/UEET/StudentSite/dynamicsofflight.html
⇒ National Museum of the U.S. Air Force: www.nationalmuseum.af.mil/Education/ForEducators.aspx

ANNEX 3

https://www.eslprintables.com/reading_worksheets/history/The_history_of_flight_336526/

Before reading the teacher asks students:

- Close your eyes, imagine that you are living in a time before flying machines are not invented. Imagine that you are flying in the sky.
  - How do you fly?
  - Do you have wings?
  - How do you feel?

Close your eyes and picture yourself flying in the sky. Imagine being able to see Earth from above. Imagine flying where there are no roads. Now imagine that you live in a time before flying machines existed. People have always wanted to fly. Leonardo Da Vinci, an Italian artist and inventor from the 1400s, drew plans for a helicopter. Many people tried to build wings. Some tied wings to their arms and flapped like birds. Others used machines to flap the wings.

Da Vinci's helicopter drawing

These wings flapped when the person moved his arms and legs.

The first people to fly were two French men. They built a hot air balloon in 1783 and floated over Paris. An English man named George Cayley built the first glider to carry a person. A glider is a plane without an engine. In 1853, his friend flew it over a valley. Fifty year later, Orville and Wilbur Wright built the first successful airplane. On December 17, 1903, Orville flew the plane for one minute and went 260 meters (850 ft).

George Cayley built the first glider that carried a person.

Airplanes are the most common flying machines. You may have ridden on an airplane. Commercial airplanes carry passengers and goods. A common commercial airplane, the 747, carries up to 500 people. Many planes have jet engines. Jet engines force hot gases in a stream behind them. The gases push jets forward. Military jets can go faster than the speed of sound. Many smaller and older airplanes have propellers. Propeller blades spin like fan blades. If you put your hand behind a fan, you can feel suction. This suction pulls the plane forward. Small propeller planes do amazing tricks. Some propeller planes spray crops. Huge cargo planes carry goods over oceans. Military bombers carry bombs. Remote control planes spy on the enemy. Fighter jets can "dogfight," or fight other planes in the air. Mail planes ship packages overnight. People also fly planes for fun.

Hot Air Balloon Experiment:
What You'll Need:

*36" helium-filled balloon
*Light basket
*Netted bag -often used to package produce like onions, or oranges
*Ribbon – 5 yards
*Toy
*Scissor

Procedure:

Step 1: Cut the handles off the basket.

Step 2: Put the basket under your balloon. Anchor the balloon 6 or 7 inches above the basket by taping a string (tied to the balloon) to a table or floor.

Step 3: Cut the netted bag to make as big of a rectangle as you can. Place it on top of the balloon.

Step 4: Thread the ribbon through a hole at the top of the basket and extend the ribbon to the nearest corner of the netting – tie to the netting. Repeat 5 more times to even distribute 6 lines around the balloon.

Step 5: Experiment with light weight toys to see what weight balances the buoyancy of the balloon. You want the toy to be just heavy enough to make the balloon come down ever so slowly. Tape the toy to the bottom of the basket.

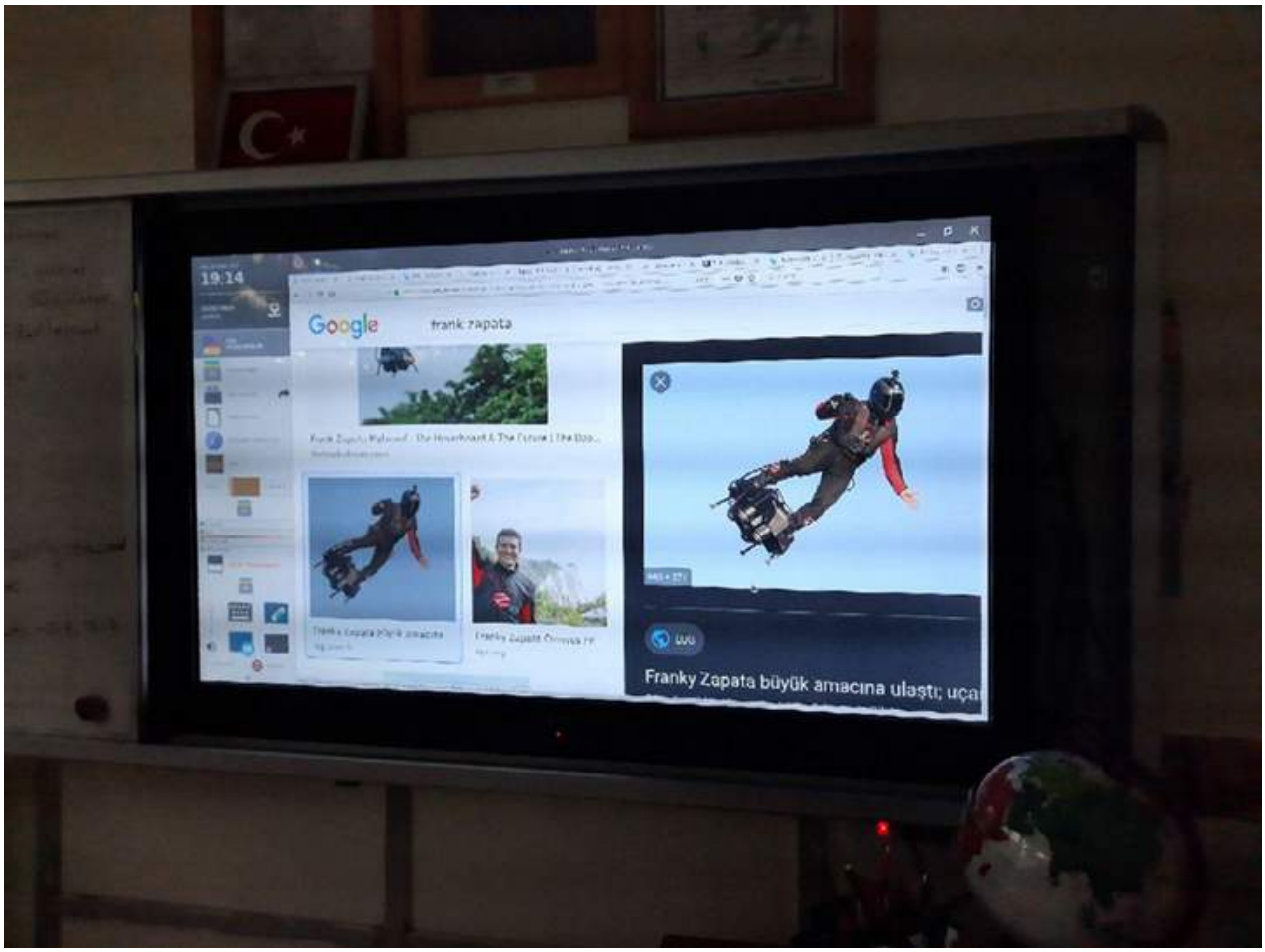
Step 6: Cut the balloon's string close to the floor or table.

Step 7: Rotate the balloon so the knot points up and is in the middle of the netting. Use the balloon's

ANNEX 5:

Another reading activity was done on French inventor Franky Zapata and his flyboard. His video of crossing the English channel was watched. Students learnt more about different ways of flying.

https://www.dailymail.co.uk/news/article-7319143/French-inventor-Franky-Zapata-person-successfully-cross-English-Channel.html



ANNEX 6:

Cooperating with art teacher students designed and created their gliders and planes; drew rockets.

ANNEX 7:

English teacher and Technology teacher and students collaborate to design spaceships on tinkercad. Designed spaceship is produced on 3d printer.

ANNEX 8:

A speaking activity about where to live apart from Earth, how to live, how to build our houses, what to take to this new house are all spoken and discussed and then a writing activity is done.

ANNEX 9:

Actrostic poem (is available at the link below)

https://www.canva.com/design/DAEygMN50fA/2Zi2Ths_L6glHqs1jrNJTQ/edit?utm_content=DAEygMN50fA&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton

POETRY - POEM - THE LAKE ISLE OF INNISFREE

PART 1. OF SCENARIO

TITLE	Poetry - Poem - The Lake Isle of Innisfree
MAIN SUBJECT	English
OTHER SUBJECTS/DISCIPLINES	Creative writing, and philosophy
TYPE	*Unit of Learning (4 - 5 lessons).*
DURATION OF CLASSES	58 minutes
AGE OF STUDENTS	13-14

PART 2. OF SCENARIO

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• Students will develop their knowledge of different poetic techniques and devices. • Learn about one key prolific writer from Irish literature. • Learn about the importance of different themes/ issues in Irish literature, e.g. land, freedom, dreams. • Learn about creative and imaginative writing. • Continue to develop vocabulary. • Continue to develop use of aesthetic techniques. • Know how to use quotes in answers supported with clear points and explanations.
	IN THE FIELD OF SKILLS	• Students will be able to read, discuss, analyse and critique poems by W.B. Yeats. • Develop literacy skills, specifically relevant to the study of poetry. • Develop writing skills. • Develop exam skills. • Thinking creatively and critically. • Reflecting on and evaluating learning. • Using digital technology to access, manage and share content. • Work independently and with others.

	IN THE FIELD OF SOCIAL COMPETENCES	• Creating awareness of Irish literary writers • Appreciation of Irish culture and literature. • Develop awareness of different poetic techniques. • Apply use of aesthetic techniques. • Develop writing and creative skills. • Promote use of accurate punctuation. • Be able to approach new reading material and develop the skill of looking up unknown words (online dictionary/ thesaurus). • Promote independent thinking, aspirations, and dreams.
TEACHING METHODS /APP-ROACH	• Discovery based and inquiry learning. • Sensory based - play music that evokes the atmosphere in the poem, and play/ recreate the sounds in the poem. • Use of aesthetic and image based stimulus. • Student centred - build on their own experiences and prior knowledge. • Multi media approach - strong use of I.C.T., e.g. mobile phones, YouTube clips. • Discussion based - Arrange students into pairs/ groups. • Pair and Group work.	
SUGGES-TED TEACHING TOOLS/ MATER-IALS NEEDED	• Relevant textbooks and websites online. • Digital devices, e.g. chromebooks, mobile phones etc. • Colourful chart paper for group work. • Pens, paper, markers. • Whiteboard and projector. • Mini whiteboards.	
PRELI-MINARY CONDIT-IONS (if applicable)	*Are there any conditions that must be fulfilled so that students can effectively participate in the classes (e.g. they must have completed a course on some specific subject, they must play some instruments etc.)*	

TIPS / METHODO-LOGICAL REMARKS	Pair with other poems e.g. Dreams by Langston Hughes, or lyrics of songs about dreams/ escapism, e.g. New York by Alicia Keys and Jay Z. Incorporate into a wider study of texts that deal with this theme, e.g. The American Dream, space, travel. Text - Of Mice and Men. **Useful links:** Mise Eire song Biography of W.B. Yeats. The Passion of Yeats Jamboard - Google. Kahoot.com Randomizer wheel of names. Paradise by ColdPlay Dreams by The Cranberries. W.B.Yeats reading his poem The Lake Isle of Innisfree. Clip 2 of Yeats reading his poem with scenic imagery. English Textbook Chrysalis used with a copy of poem. Online copy of the poem - The Lake Isle of Innisfree. YouTube for various sounds in the poem, e.g. linnet's wings, cricket sounds, honey bee sounds, lake water lapping... Mentimeter

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTE RISTICS	• A differentiated approach. • Scaffolding, build on what students already know, their own experiences. • Cater for different learning styles, evident in different pedagogical approaches. This includes: kinesthetic, visual, auditory, verbal, interpersonal and intrapersonal learning styles.

BASIC TERMS	• Connotations • Heaven • Bliss • Utopia • Seventh heaven • Dreamland • Paradise • Identity • Theme/ issue • Describe • Interpret • Explain • Imagine • Create • Escapism • Poetic techniques and poetic devices, e.g.: imagery,symbolism, alliteration, simile, 5 senses et • Aesthetic techniques • Prolific • Nobel Peace Prize • Poet • Dramatist • Irish Literary Renaissance • European Literary Modernism • Artistic form •

STRUC-TURE	LESSON 1	**Plenary lesson- understanding what prior knowledge students have, introduce literary figure W.B.Yeats and review poetic techniques.** **Step 1** **Teaching strategy: Clip stimulus and Think, Pair Share** - play first Clip - Mise Eire song to evoke a sense of identity and emotions. Ask students to check in with the student next to them - discuss what it means to be Irish. Record short reflection in copy. **Step 2** **Teaching strategy: Think, Pair Share activity** - play short biography on W.B.Yeats, brainstorm into each copy 5 key things learned about W.B.Yeats. Second Clip - Biography of W.B. Yeats. Third clip - The Passion of Yeats - optional if more time and high ability class. Using mobile phones and working in pairs research 5 more points of information about W.B. Yeats as a writer. Use biography in the textbook also provided. Record thoughts into copy. **Step 3 - Collaborative interactive brainstorming session on Jam Board.** Students can add images, sounds or words they associate with what they have learned so far about W.B. Yeats. **Step 4 - AFL - Review different poetic techniques through a game of kahoot.** Provide 5 mins to individually review worksheet and notes in copy on key poetic techniques (see handout). Participate in teams for the game of kahoot. Teacher leads questions on the board that challenge students on what each technique means and various examples. H.W. - find an example of a song about dreams.
	LESSON 2	**Lesson focus - escapism and creative thinking.** **Starter activity** - discuss h.w. from the previous lesson (thinking and research task) - to find an example of a song about dreams. **Step 1 - Think pair share discussion and randomiser wheel** - In pairs students share and discuss the song they picked. Some examples: *Paradise ColdPlay, Les Mis I Dreamed A Dream, Train Drops of Jupiter, California Dreamin, Daydream Believer, Bohemian Rhapsody, Dreams by The Cranberries etc.*

		Spin the randomiser wheel - each student's name in the class is spun, whoever it lands on will share a song of choice. Option to play clip on board also, students share from top of class at teacher desk. **Step 2 Braindump** - play Paradise by ColdPlay and Dreams by The Cranberries. While the music is playing students work individually to create a brain dump in their copy of their paradise. Essentially a blank page, no title on top of page in their copy allows a chance to be as creative as possible. Option to write a descriptive paragraph or to sketch what they imagine their dream world to be like. Stimulus includes imagery on slides on whiteboard, see attached. Prompt questions e.g. if you could leave this mundane ordinary day and escape from school, where would you go?... A favourite holiday, An imaginary trip, What they are dreaming of right now etc. **Step 3 - Musical chairs and AFL** - 3 min task to energise, leave copies open on desk and move/ dance/ stretch, when the music stops look at another student's copy. **Step 4 - Vocabulary focus** - Note key terms from slides on board associated with Utopia/ heaven/ dreams. 5 mins use an online dictionary (mobile phone) to look up other connotations with the term dream. **Step 5 - First reading of poem The Lake Isle of Innisfree**. Listen and watch a recording of W.B.Yeats reading his poem The Lake Isle of Innisfree.Read The Lake Isle of Innisfree led by the teacher, students underline/ highlight 3 images from the text of the poem in their book. Teacher explains unknown words. **Step 6 - Role Play** - Arrange students into groups of 4. Rotation in turns read/ act out in succession lines from the poem. E.g. student one reads line one, student two reads line two etc. KWL = complete plenary what have they learned, and what would they like to know in their copy.
	LESSON 3	**Lesson focus - annotation of poem, group work, and written response to poem.** **Step 1 - AFL** - Complete the know part from the previous lesson of their KWL on the poem The Lake Isle of Innisfree. Allow time to silently re-read the poem and to listen to another different recording of the poem being performed. Complete metimenter with 1 short prompt question on the poem.

		Step 2 – Group work and group annotations – Arrange into groups of 4, assign roles, 10 mins max. Main focus is on identifying a range of different poetic techniques used in the poem, annotations completed on large A3 versions of the poem. All participate by writing on the chart paper. Also look up unknown words. Get focused feedback from groups, to ensure accountability can put names into a randomiser wheel and select maybe 2 different groups (vocal feedback). **Step 3 – Class discussion and class graffiti** – After differentiation of tasks, show a large text of poem on the whiteboard. Invite one member from each group to the board to annotate some feedback on board.Take a photo of class graffiti and annotation, upload to Google classroom. Students can also copy annotations into their own copy of the poem in their textbook. Hang group work around classroom walls. **Step 4 – Write personal response to the poem – PQE answer.** E.g. of type of question = **What is your favourite image/ line from the poem and explain why?** Remember to use a quote from the poem, and to explain how this shows your favourite part. Your answer should be 10 sentences. Share success criteria on whiteboard and Google classroom.Students note this into their English copy. For differentiation and to cater for different abilities, slides with some prompt sentence starters are on Google classroom and on the classroom whiteboard. Students can use their mobile phone to look at these slides and to look up their online dictionary/ thesaurus when writing.
	LESSON 4	**Lesson focus – Diary Entry.** **Step 1:** **Teaching strategy: learning aimsand learning outcomes shared.AFL approach and Instructional Leadership.** Success criteria and lesson focus on Google slides on the whiteboard.Shared also on Google classroom for students to view on their mobile phone. Students note learning aims to self assess during class with regular "check ins." For starter activity Rapid writing – on recycled A4 paper students have 4 minutes to write/ draw as much as they can recall about writing a diary entry. Once time is up students turn their page into a paper plane with a name. Then instruct to line up at opposite sides of the classroom, countdown and throw planes.Each student picks up a different plane to assess what is written on the page. Quick discussion and feedback.

		Step 2: **Teaching strategy: students write their diary entry about a visit to their paradise using I.C.T. skills on school chromebooks.** Promote independent learning and use of scaffolding. Students have access to their placemats, paper planes, stimulus from study of poem The Lake Isle of Innisfree, Google classroom notes to create their diary. Key word charts and posters for writing skills in the classroom. **Step 3:** **AFL – Peer assessment and class discussion: students email their work to a fellow student and share feedback.** WWW and EBI, must send back one what went well and one even better if. Teacher shares some student examples on board. **Step 4:** **Teaching strategy: plenary and review. Mentimeter feedback** – students share what they have learned for writing a diary entry and using aesthetic/ descriptive techniques.

PART 3 OF SCENARIO

BENEFITS	• Developing creative and critical thinking skills. • Developing writing and communication skills. • Developing skills of interpretation and analysis. • Interactive learning. • Student led, students are able to fully engage with the content at their pitch. • Creating cultural awareness. • Promotion of student wellbeing and aspirations. • Developing literacy skills, new vocabulary and new writing techniques learned.
RISKS AND SUGGESTED SOLUTIONS	Risk 1: Lack of internet may inhibit interactive work. Solution 1: Therefore book school digital devices in advance.e.g. chromebook or computer room. Risk 2: Lack of ICT skills may deter students from completing work online or engaging with digital elements of learning. Solution 2: Subtitles to be used for video for international students. Differentiated worksheets for students with additional learning needs Develop cross curricular links with I.C.T. and other subjects that promote I.C.T. skills.

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EL TIEMPO - THE WEATHER

PART 1. OF SCENARIO

TITLE	El Tiempo - The Weather
MAIN SUBJECT	Spanish
OTHER SUBJECTS/DISCIPLINES	Geography, other languages, Maths (numeracy)
TYPE	*Unit of Learning (5-6 lessons).*
DURATION OF CLASSES	58 minutes
AGE OF STUDENTS	12-14 (Second Year)

PART 2. OF SCENARIO

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• Students will become familiar with weather terms in Spanish • Students will learn the vocabulary for talking about different areas (north/south etc.) in Spanish • Students will use prior knowledge to deepen their understanding of typical weather patterns in Spain and in other areas • Students will be able to recognise, say and write about what the weather is like in different locations • Students will become familiar with the seasons in Spanish • Students will learn how to form the future tense in Spanish • Students will be able to use the future tense to create sentences about what the weather WILL be like in Spanish • Students will be able to recognise key elements from weather forecasts in Spanish • Students will be able to create their own weather forecasts in Spanish • Students will be able to create short videos in Spanish to demonstrate their learning and understanding of weather vocabulary

	IN THE FIELD OF SKILLS	• Communication skills:
		  ◦ listening and speaking skills - students will use their communication skills to understand key spoken texts and to share their knowledge with their peers
		• Presentation skills:
		  ◦ Students will develop their public-speaking skills by presenting and recording a weather forecast in Spanish

		• Language Skills:
		  ◦ Students will deepen their understanding of key language systems and patterns
		• Interpersonal skills:
		  ◦ group and pair work – students will work collaboratively and use communication skills to develop a deeper understanding of the topic being outlined
		• Being Creative:
		  ◦ Students will use creativity skills to create a short weather forecast video in Spanish
		• Being curious:
		  ◦ Students will research information on weather systems/patterns in different areas and then share this information with the class
		• Reflecting on and evaluating learning.
		• Using digital technology to access, manage and share content.

	IN THE FIELD OF SOCIAL COMPETENCES	• Teamwork • Using prior knowledge to logically evaluate and predict weather patterns and behaviour • Digital technologies – students will use their ICT skills to create presentations and complete tasks
TEACHING METHODS/ APP-ROACH	• Communicative language teaching – drawing information from students rather than instructing • Focus on students' existing knowledge and draw this out – contextual focus on prior knowledge – meet them where they are • Active learning and discovery methodologies • Wide range of activities to suit all learning styles – mixture of digital technologies, authentic sources and more didactic, language-focused activities including gap-fill exercises and prescriptive texts • Emphasis on all five language skills – reading, aural, written, spoken interaction, spoken production • All tasks scaffolded and differentiated as necessary based on cohort • Students encouraged to reflect on and take ownership of their own learning • Focus on Assessment for Learning	
SUGGES-TED TEACHING TOOLS/ MATER-IALS NEEDED	• Textbooks and notes copies • Whiteboard and projector • Templates for placemats and board game activities • Mini whiteboards and markers • PowerPoint presentations on weather terms and future tense • Chromebooks / mobile phones for weather forecast task • Digital materials	

PRELIMINARY CONDITIONS (if applicable)	*Are there any conditions that must be fulfilled so that students can effectively participate in the classes (e.g. they must have completed a course on some specific subject, they must play some instruments etc.)*
TIPS / METHODOLOGICAL REMARKS	Websites/online sources: • El Tiempo con Roberto Brasero - YouTube • www.wheelofnames.com • www.kahoot.com • www.blooket.com • www.quizlet.com **Other easy language games/sources that could easily be used as fillers/ starters/plenaries here:** • Weather forecast Bingo • Noughts and crosses • Snakes and ladders • Group work - jamboard

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	• Stage 1 - Introducing key elements - start with students' existing knowledge • Stage 2 - Reinforcement of key vocabulary through the use of a range of activities and language games • Stage 3 - Tie grammar learning in with vocabulary - keep intrinsic link here to emphasize communicative element of language learning • Stage 4 - Students apply the knowledge they have gained and use this to complete a meaningful task • Stage 5 - Students use peer- and self-assessment strategies and use these to reflect on their learning
BASIC TERMS	• el tiempo • el pronóstico • hace calor / frío / viento / sol / buen tiempo / mal tiempo • hay nubes / tormenta / niebla / chubascos • está nublado / nuboso / despejado • llueve • nieva • Las temperaturas - hace treinta grados / con temperaturas máximas/ mínimas de veinte grados • En + países (eg En España / Irlanda...) • Directions - el norte / el sur / el este / el oeste / el noreste / el noroeste / el sureste / el suroeste / el centro • En primavera / verano / otoño / invierno...

BASIC TERMS	• Normalmente / siempre / nunca / de vez en cuando / raramente • Los números • El futuro	
STRUC-TURE	LESSON 1	**Introductory lesson - introducing vocabulary, identifying students' prior knowledge of this topic.** **STARTER / HOOK - Video clip** - AURAL ONLY - El Tiempo con Roberto Brasero - YouTube (00:00-00:30) Students' task - to identify the TOPIC from the audio - listening for GIST - eg recognising temperaturas máximas / mínimas / pronóstico / meteorológico etc. **Activity 1 : Placemat - Collaborative interactive brainstorming group work session** Students brainstorm key facts about what the weather is like in Spain and then share most relevant / common points with the class - based on cultural awareness and prior knowledge **Activity 2 : PowerPoint presentation - El tiempo** An explicit introduction to key weather terms in Spanish - focus on oral pronunciation and vocabulary recognition as this vocabulary is generally required for listening tasks. **Activity 3 : Plenary - Pair work** Students must tell their partner one sentence in Spanish about today's weather
	LESSON 2	**Focus - Reinforcement of key vocabulary - revision of months of the year and seasons and tying this in with weather terms.** Starter - Audio visual clip - weather forecast El Tiempo con Roberto Brasero - YouTube (same as previous class but this time play video also and for longer - 00:00-03:12) - students aim to identify 2+ weather terms that they learned in previous class. Extension - stronger students could try to identify days of the week mentioned / names of places / directions Activity 1 - Pair work - board game - Connect 4 Students take it in turns to create a sentence in Spanish about what the weather is like in any particular season and say this to their partner, using the pictures and words on the board. If they correctly translate the sentences based on the images provided, the student can put their initials into the appropriate box. The other student then takes their turn, trying to prevent the first student from having four correct answers / initialed boxes in a row.

		The winner is the first student to have four boxes next to each other (horizontally / vertically / diagonally) with their initials in them. **Activity 2 - Reinforcement - written task** 1. **Pre-teach vocabulary - seasons** To complete this short written task, students will need to recognise the four seasons in Spanish so quickly outline these on the board. 1. Using the game outlined in Activity 1, students must now write down any two sentences about what the weather is like in any particular season (in Ireland or in Spain) -eg En Irlanda, hace sol en el verano -En España, hace fresco en el invierno **Activity 3 - Reading text - El tiempo** Students now put what they have been learning into practice by answering six short questions on a reading text in Spanish about the weather in Spain Pre-teach vocab.: To ensure that all students can access the information in this text, pre-teach the following vocabulary items to help students to identify vocabulary in context: -hay rayos / hay trueno / tres grados bajo cero **Activity 4 - Mini Whiteboards** To assess students' understanding of key weather vocabulary so far, play an interactive game where weather terms in Spanish / English appear on the board and students must translate these on mini whiteboards and show the teacher. To challenge stronger students, images relating to weather may also appear on the screen that the students must translate into Spanish. Differentiation - can be done as pair/ group work so that weaker students can work with stronger students and gain greater understanding
	LESSON 3	**Focus - Weather forecast and directions - students will begin to identify weather elements in different areas of Spain / different countries by learning about directions** **Starter: Interactive game - Kahoot - weather terms - to reinforce vocabulary and check for understanding** Students have permission to use their mobile phones to complete this activity and can work in pairs if necessary to ensure that all students have access to a device **Activity 1:** Audio clip - El Tiempo con Roberto Brasero - YouTube (00:00 - 00:30) - Students are to listen out for a DIRECTION / AREA which is mentioned THREE times during this short clip (EL NORTE) and note this down.

		Students are then to explain why it might be necessary to include a direction such as el norte in a weather forecast. On the board, draw the outline of a compass and translate key vocabulary for north, south, center, northwest etc. **Activity 2: Listening activity to reinforce understanding** Students will listen three times to ten short clips and fill in a simple table with the following information – date, place + weather. Differentiation – ALL students need to try to identify 1+ piece of info. out of 3 MOST will hopefully be able to identify 2+ pieces of info SOME will be able to identify 3 pieces of info for each part **Activity 3: Pair work oral task – information gap worksheet** Students will work in pairs for this task – Student A, Student B. Each student will be given a map of Europe with images of weather next to five of ten countries – different worksheet given to Student A and Student B. To fill in the weather information for the remaining five countries, each student will have to ask their partner in Spanish ¿Qué tiempo hace? and their partner will respond in Spanish with the weather information about that place which the student will then fill into their worksheet.
	LESSON 4	**Focus – To be able to use the future tense to describe what the weather WILL be like (SIMPLE FUTURE)** Starter: Reading Task 2 – to reinforce vocabulary covered so far and give examples of the future tense being used in a weather forecast in Spanish 5 – 10 minutes activity – students can answer 7/8 questions of increasing difficulty to reinforce information covered so far. Differentiation – weaker students to complete first 5/8 questions – lower order thinking Extension – Question 8 = Higher order question to challenge stronger students Correct qs 1-7 together and then ask stronger student to identify what form HABER takes in the future tense to introduce this topic. **Activity 1: Explicit teaching of future tense** Having looked at the example of HABER in the future tense, now go through the future tense of all regular and irregular verbs in the future tense and do exercises to practise these in class. Keep checking in with students and regularly questioning them to see whether they are understanding this new tense / new information (Assessment for Learning) and go through this again if necessary

		Activity 2: Gap-fill exercises and drills on future tense to aid student understanding through practice **Activity 3: Spinning wheel game + mini whiteboards.** Using www.wheelofnames.com, load a list of infinitive verbs and subject pronouns in Spanish (eg hablar-tú, comer-yo etc.) Spin the wheel and students must conjugate verbs in the future tense on their whiteboards and then show the teacher. Differentiation - can group stronger and weaker students together to aid understanding where necessary
	LESSON 5	**Lesson focus - Creation of weather forecast task - giving students the opportunity to apply the knowledge they have been learning and put this into practice** **Starter: Wheel of names game + mini whiteboards - student-led, student autonomy** Students will each load one weather phrase in Spanish / English into www.wheelofnames.com on the teacher's computer (eg It will rain tomorrow / En el norte hará mucho sol) and the class will do a short mini-whiteboard activity to practice understanding and creating sentences in the future tense using weather terms **Activity 1: Weather Forecast Task** Students will create a short video (up to 60 seconds) where they will outline the weather forecast in Spanish. They can use props, work individually or in groups of 2 and create slides to show in the background of their videos - to make these more authentic. Full list of success criteria will be shared with students and students must ensure to address all elements on the list of success criteria when completing the task. Recorded videos will be shared with the teacher through the shared Google Classroom page and shown during the next class.
	LESSON 6	**Lesson focus - Self- and peer-assessment - weather forecast task and topic review / plenary** **Activity 1: Weather Forecast Videos - self and peer-assessment** Play each of the weather forecast videos created by students for the class. Following each video, ask students to write a short self- / peer-assessment including: 2 things that they felt went well / 2 areas where students fully addressed elements of success criteria 1 area that they felt could be improved on next time

	LESSON 6	Following the playing of all videos, ask students to share the positive elements that they found from watching the other videos and ask students to identify some of the areas that they found they would like to improve from their self-assessments. **Activity 2: Reflection on task** Students can then individually write a short reflection on how they felt they got on with the task including elements that they felt they did very well and they can identify some areas that they will focus on improving in future topics and tasks **Activity 3: Plenary – Class Game of Hangman – Weather terms/sentences** To finish this topic, the group will finish with a short whole-group activity where students will choose weather elements / short sentences in Spanish and the rest of the class will call out letters to piece together the answers and call them out for the class.

PART 3 OF SCENARIO

BENEFITS	Meaningful learning, students engaged, enjoyable activities, use of authentic materials and real-life knowledge, collaboration opportunities and group work, use of ICT and digital technologies, use of scaffolding and differentiation to ensure that material is accessible to all.
RISKS AND SUGGESTED SOLUTIONS	**Risk 1:** Students may not participate fully in group work tasks and rely on others to complete the work set. **Solution 1:** Circulate regularly throughout all group work tasks and ask questions regularly to ensure that all students are engaging and participating **Risk 2:** Students may not have access to digital devices which may make interactive games and digital tasks more challenging **Solution 2:** – Permit students to look in with another student who has access to a digital device and ensure to book chrome books/ computer room for weather forecast task.

SMART WALKERS

PART 1. OF SCENARIO

TITLE	Smart walkers
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	English – Art - Physical Education - ICT– Museum Educational Department
TYPE	*larger educational project and study visit*
DURATION OF CLASSES	Number of lessons: 3x90m + study visit
AGE OF STUDENTS	15-18

PART 2. OF SCENARIO

AIM OF CLASSES		The importance of museums is unquestionable not only for their active cultural role in any given community but also because they are guardians of our shared memory. In consonance with this responsibility, most museums have educational departments, for students of several ages and levels, which are designed to cooperate with schools and formal education and enrich any methodological approach. This learning scenario evolves around such a museum, conjoining orienteering, works of art and language learning skills, and overall aims at promoting cooperation and teamwork, at raising students' awareness of artistic languages and expressions and at improving the students' English writing and speaking skills.
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	**Students are expected to:** Develop art competences Interpret attitudes, emotions, viewpoints and intentions of an artwork Expand their vocabulary (art, wishes, hopes, feelings...) Consolidate grammar structures Become familiar with the use of a compass and map interpretation Differentiate types of courses

	IN THE FIELD OF SKILLS	Question artistic processes for understanding art Interpret works of art by understanding its implicit and explicit ideas/messages Develop critical thinking skills Develop creative thinking skills Interact orally in discussions, using alternative ways of expression and reformulation to facilitate understanding Plan and write structured texts, considering their function and target reader Improve their navigational skills: map orientation, compass use, walking
	IN THE FIELD OF SOCIAL COMPETENCES	• Creating awareness of Irish literary writers • Appreciation of Irish culture and literature. • Develop awareness of different poetic techniques. • Apply use of aesthetic techniques. • Develop writing and creative skills. • Promote use of accurate punctuation. • Be able to approach new reading material and develop the skill of looking up unknown words (online dictionary/ thesaurus). • Promote independent thinking, aspirations, and dreams.
TEACHING METHODS	Study visit Experiential learning Flipped classroom Student-centred approach Role-play Discussion of ideas and views Teamwork, pairwork, individual work	
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Computer Powerpoint presentation Online quizz Map Puzzle map Compass Worksheets for analysis of artwork Cell phone or tablet Projetor Notebook Pen, pencil	
PRELIMINARY CONDITIONS (if applicable)	*The students should be level B1(intermediate) or B2(upper intermediate*	

TIPS / METHODO-LOGICAL REMARKS	In English – class 2, depending on class size, it may be more adequate to do this activity in groups of 4, rather than in pairwork. The writing activity suggested can be adapted or changed, according to the students ages and level of English. Please see bibliography for more suggestions. Throughout this learning scenario and especially during the writing activity,the teacher acts as an assistant, helping the student with vocabulary, grammar or any other aspects and directing the student to the use of online tools, such as thesauruses and dictionaries.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**English**: Expressing wishes, feelings and emotions Giving opinions, agreeing and disagreeing, arguing Developing writing and speaking skills Considering different types of text and target audiences vocabulary (art, wishes, feelings, emotions) Consolidating grammar structures Using fillers, connectors and linking words (cohesion and sequence) **Art**: Museums and collections: Contextualizing artistic objects of different cultures and historical periods in relation to the History of Art (styles, movements, intentions and disruptions/ruptures) Differentiating figurative and abstract art Recognising the values and functions of art Identifying and interpreting visual elements in a work of art **PE**: Cooperating with peers in orientation courses, respecting pre-established safety and environmental preservation rules Executing a simple orienteering course in an appropriate space, following a map, filling in a control card and managing effort to resist fadigue Placing the map correctly according to cardinal points and/or other reference points and using the compass as auxiliary Identifying locations according to reference points, to the surrounding space and to the map Identifying the best and fastest route to reach control points
BASIC TERMS	**Orienteering, pedestrianism, feelings , emotions, artwork, museum, art**

STRUC-TURE	PHYSI-CAL EDUCA-TION LESSON 1	**Before class (homework):** STEP 1 – Sts are sent a Powerpoint presentation on pedestrianism and route classification (by email, MicrosoftTeams or equivalent) (and are asked to watch it and solve an online quizz about it (Kahoot or equivalent). **In class:** STEP 1 – Sts provide feedback on the powerpoint presentation and the quizz. STEP 2 – Sts and teacher analyse the quizz results, recognize/detect any remaining doubts and clarify them. STEP 3 – Sts. are expected to execute a route in the school grounds, according to a handed map, recognising cardinal points/reference points and using the compass as auxiliary.
	PHYSI-CAL EDUCA-TION LESSON 2	**Study visit:** STEP 1 – Sts. gather at a meeting point and are handed out a puzzle map. STEP 2 – In pairs, sts. solve the puzzle and use it to find the fastest route to the museum. STEP 3 – Teams arrive at the museum and the winning team is determined.
	ART LESSON 1	**At the museum:** STEP 1 – Sts go on a guided tour of the museum (museum guide and/or art teacher). STEP 2 – In pairs, sts are handed out a table to be filled with information about any art piece of their choice. Their chosen art must, however, contain or depict people. STEP 3 – Sts are asked to photograp/video their art piece, in full and in detail. The images are to be used in a final project work.
	ENG-LISH LESSON 1	**At the museum:** STEP 1-Each pair is asked to observe the artwork of their choice and think carefully about the following (worksheet): *Who the people are;* *Where they live;* *What they do for a living;* *What kind of person they are;* *What their dreams are;* *What their fears are;* *What has just happened;* *What they are doing;* *Why they are there;* *What is going to happen next* STEP 2 – Sts are further asked to individually note down what they imagine might be the secret feelings and thoughts in the mind of the character(s), considering they feel trapped in the art piece and want to rebel against the artist/artwork. STEP 3 – Students pair up again and compare what they have written.

	ENG-LISH LESSON 2	STEP 1- Working in the same pairs as in the museum, sts are asked to write a dialogue between the artist of their chosen art piece, and the character whose secret thoughts they imagined, voicing the characters' rebellion and the artist's position. They can select information from the input collected and registered at the museum (worksheets and their notes). The dialogue is to be acted out for the class, the following lesson. STEP 2 – Sts are encouraged to be creative and to think outside the box. Sts are also asked to bring any props they need for the next lesson.
	ENG-LISH LESSON 3	**The seating arrangement for this lesson should be horseshoe-shaped** STEP 1 – The different groups/pairs perform their dialogue to class. STEP 2 – Students provide oral feedback on the several performances. STEP 3 – Students provide oral feedback on the learning scenario itself and analyse their own progress.

PART 1. OF SCENARIO

TITLE	Smart walkers
MAIN SUBJECT	English
OTHER SUBJECTS/DISCIPLINES	• Music • Dance • ICT • Art/Design
TYPE	Intercultural Dimensions of Art constitutes a supportive and complementary educational project mainly to religious, language and literature classes included in the school curriculum. However, the Intercultural Dimensions of Art project is not limited only to the aforementioned classes, but it can be combined with other classes as well depending on the thematic topics they deal with each time. It addresses to teachers of secondary schools, educators, and methodological centres staff.
DURATION OF CLASSES	3 lessons x 90 minutes
AGE OF STUDENTS	Students between the ages of 13-18

PART 2. OF SCENARIO

AIM OF CLASSES	It is not rare for concepts surrounding intercultural dialogue and interculturalism to be embedded in religious, language and literature classes of a school curriculum. Have you ever thought about how manageable is for students at the age of 13-18 to deal with such complex and challenging notions? **Art-based teaching can present difficult and demanding concepts visually, making them more easily understandable and digestible for youngsters.** Interculturalism and intercultural dialogue are among the notions that are characterized by conceptual complexities which undoubtedly need further explanation. Particularly, as multiculturalism is expanding rapidly nowadays and there is an urgent need to understand cultural differences, art is considered a very **creative and interactive education method to help students learn more easily about different cultures, civilizations and traditions; in other words, learn about the 'Other'**. As well illustrated by Pitman and Pereyra (2016, p. vii) "artistic expression is often used as a tool to better understand otherness and to communicate with the Other."

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • deconstruct intercultural complexities • understand more easily interculturalism and intercultural dialoue • gain deeper meanings and understandings of interculturalism and intercultural dialogue • have a long-lasting learning (easily recall of information retrieval) **visualization of complex concepts** • learn about different cultures and traditions in a creative and interactive way
	IN THE FIELD OF SKILLS	Students can gain a number of useful skills and competencies such as: • develop artistic skills • improve intercultural skills • learn how to use art-based techniques • synthesize information • develop arguments • recreate artifacts • problem solving • critical thinking • develop observation, curiosity, exploration • develop a pluralistic approach and appreciate different opinions • develop hand-eye coordination
	IN THE FIELD OF SOCIAL COMPETENCES	• Creating awareness of Irish literary writers • Appreciation of Irish culture and literature. • Develop awareness of different poetic techniques. • Apply use of aesthetic techniques. • Develop writing and creative skills. • Promote use of accurate punctuation. • Be able to approach new reading material and develop the skill of looking up unknown words (online dictionary/ thesaurus). • Promote independent thinking, aspirations, and dreams.
TEACHING METHODS	To what extent art-based learning can be used as a tool for teaching interculturalism and intercultural dialogue? The potential of arts in facilitating knowledge acquisition on such challenging topics is outstanding. In order to exploit at the maximum level that art-based teaching potential some **student-centred teaching methods** are proposed: • brainstorming (it helps students to generate questions while it enhances their critical thinking) • discussion (it is considered a cooperative interactive process through which students clarify understanding of concepts, exchange ideas and information with their peers and teachers/educators)	

	• experiencing (by viewing, hearing, reading or/and touch art complex notions can be easily decoded and deconstructed) • guided exploration (teachers/educators are the ones who will guide students until they gain the expected knowledge on the discussed topics) In addition, important prerequisites for the successful appliance of the aforementioned teaching methods are students' active **collaboration**, **engagement**, **participation** and **interaction**.
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Integrating art-based learning into religious, language and literature classes is not an easy task. In order to come up with innovative and creative art-based methodologies, it is essential for teachers/educators to perceive art, not as a single, independent concept, but as a **notion that can take varied forms** (such as written, audiovisual, hands-on experience etc.). Experiencing art **(viewing, hearing, reading or/and touching)** can greatly help students to understand in depth concepts surrounding interculturalism and intercultural dialogue. In this respect, a number of art-based teaching tools can be deployed for simplifying students' learning on such challenging topis. The following tools/materials are recommended: • ceramics • drawings • paintings • sculpture • printmaking • design • crafts • photography • video • film making • guests visits • musical compositions • theatrical plays
PRELIMINARY CONDITIONS (if applicable)	As far as Intercultural Dimensions of Art constitutes a supportive and complementary lesson included in the school curriculum, it is a prerequisite for students to have attended all the appropriate religious, language and literature classes, as those subjects are the ones that concepts of interculturalism, and intercultural dialogue appear more frequently. In addition, it would be useful for students to have attended some art/design, music, dance, and ICT lessons in case they will be asked to create or/and reproduce a piece of art (e.g., a craft, a painting, a music composition, ethnic dance etc.). By experiencing arts in its many forms, students have a great opportunity to develop an **intercultural intelligence**, which will assist them to adapt effectively to new cultural contexts. Finally, as in the case of the Historical Reenactment, Intercultural Dimensions of Art lessons also constitute a great opportunity to indicate to students that school subjects do not stand independently but they are strongly related to each other depending on the perspectives we approach them each time; in other words, that is we call as an **interdisciplinary teaching method**.

TIPS / METHODO-LOGICAL REMARKS	Even though art can be approached from different perspectives, given the fact that it can take varied forms, in the present educational scenario is mainly perceived as a **teaching communicative mediator** aiming to deconstruct complex information about interculturalism and intercultural dialogue.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Understanding Interculturalism and Intercultural Dialogue** *"Intercultural understanding is an essential part of living with others in the diverse world of the twenty-first century. It assists young people to become responsible local and global citizens, equipped through their education for living and working together in an interconnected world."* Source: Cultural Infusion The environment within which we live and interact is fast-changing becoming more and more diversified. Cultural diversity is an essential condition of human society, brought about by cross-border migration, the claim of national and other minorities to a distinct cultural identity, the cultural effects of globalization, the growing interdependence between all world regions and the advances of information and communication media. In this changing landscape, intercultural understanding is more important than ever, particularly for the youngsters, as future global citizens. In schools' curriculum, particularly in religious, language and literature classes concepts surrounding interculturalism and intercultural dialogue have a regular presence either direct or indirect (underlying meanings). The focus of this introductory lesson is upon examining interculturalism and intercultural dialoge in conceptual terms. What exactly are interculturalism and intercultural dialogue about? Theory, case studies and examples will be presented to students in order to gain the best possible knowledge on such complex topics. By the end of the course, students should be capable of understanding interculturalism and its multifaceted aspects. **Celebrating Interculturalism Through Arts** How can art act as an intercultural mediator in education? What is the potential of art in facilitating intercultural knowledge acquisition? The power of art as a **meanigful expression of culture** is well established in the academic culture and particularly in the insightful book under the title Art and Intercultural Dialogue. "Art is one of the most easily internationalized cultural products" (Goncalves p. 4). Given the substantial contribution of art in intercultural understanding, educational systems have started incorporating in their teaching methods art as an intercultural mediator. In this lesson, 2 art-based crafts activities about interculturalism take place, aiming to help secondary students to learn and understand in a creative way the importance of the 'Other'.

	Celebrating Interculturalism by Learning About and Playing Ethnic Music *"Music, as a diverse human practice, is central to the constitution of cultural and individual identities."* —David Elliot, Music Matters It is well established that music, as a form of art, can be used as a teaching resource in order to enable the development of cultural awareness in the students. The value of intercultural music learning on students have singificant positive effects, such as enhancing intercultural sensitivity. Lesson 3 offers a great opportunity to students to come in contact with music from all over the world, and learn about different civilizations and cultures in a funny and interactive way. The present lesson constitutes a journey to different corners of the world, comparing and contrasting similarities and differences. Discussions, listening to 10 music genres from the 5 continents of the world as well as producing music by students themselves are the key components that synthesize Lesson 3.	
BASIC TERMS	**Interculturalism; intercultural dialogue; cultural identity**	
STRUCTURE	LESSON 1 – Understanding Interculturalism and Intercultural Dialogue	**STEP 1** The teacher distributes to students a handout containing important terms and concepts. You can be inspired from the following handbook, which is available online. Teaching in the Intercultural Classroom **STEP 2** The teacher introduces to students the concepts of interculturalism by presenting them a short video. You can watch the following video on YouTube: https://bit.ly/3KJvMfX **STEP 3** The teacher uses objects of significance to individuals and shared experiences to forge intercultural connections in the classroom. These methods can help to make intercultural issues more personal and concrete. A visit to a cultural institution such as an Immigration Museum provides an opportunity to introduce students to a wide range of objects and experiences. **STEP 4** "Let Me Tell You What I See" - The teacher requests from students to see the objects/exhibits and speak on issues and experiences relevant to them. STEP 5 The teacher poses questions to students, such as: • How did you feel by visiting the museum? • What did you learn from investigating the collection?

	LESSON 2 – Celebra-ting Intercul-turalism Through Arts	**Multicultural Paper Dolls** **STEP 1** The teacher introduces to the children the following statement: "All of us are unique individuals from varying backgrounds, but we are all somehow connected." **STEP 2** Teacher presents various concepts and asks students about their meaning. (cultural diversity / interculturalism / cultural identity / uniqueness) A brainstorimg discussion takes place. It is recommended the collaborative digital whiteboard Miro (https://www.miro.com/) to be used facilitating and making more interactive the process. **STEP 3** Under the guidelines of the teacher, students create an accordion fold in a sheet of paper so that there are eight equal sections. Each section will be half of a paper doll. **STEP 4** Students draw half of a human figure onto the top piece of the accordion fold. **STEP 5** Students cut along the drawn path. Once complete, students unfold the accordion to reveal 4 complete paper doll figures. **STEP 6** Students decorate each doll with crayons, markers, fabric and any collage materials desired to create a diverse group of people from around the world, all connected and holding hands. **STEP 7** The teacher open up a discussion with students raising critical points for consideration. Some recommended questions are: • Even though all of us have different cultures and unique physical characteristics such as skin tone how we are all connected? • What kinds of things we can learn from our differences and similarities? **Intecultural Bulletin Board** *"Our diversity is beautiful and deserves to be celebrated."*
	PHYSI-CAL EDUCA-TION LESSON	**Study visit:** STEP 1 – Sts. gather at a meeting point and are handed out a puzzle map. STEP 2 – In pairs, sts. solve the puzzle and use it to find the fastest route to the museum. STEP 3 – Teams arrive at the museum and the winning team is determined

STEP 1
The teacher installs a bulletin board in the classroom and brings all the essential material will be needed for the activity. Namely, markers, paint or crayons in multi-cultural colors, scissors, pencils and paper.

STEP 2
The children in a piece of paper trace and cut out their own paper handprints.

STEP 3
The students decorate cutout paper hands using multi-cultural colored paint, markers or crayons.

STEP 4
The students add jewelry, henna markings or any other individual creative flourish to make each handprint a unique emblem of diversity

STEP 5
The students create a board backdrop by adding dark blue or black bulletin board paper. On top of that, they can use blue and green paper to represent the Earth.

STEP 6
Once the hands are dry and decorated, the students add them around the Earth's outline. The teacher encourages them to include inspired messaging at the top of the board using cut-out letters or paint.

STEP 7
The teacher poses some questions for discussion.

- Explain what does diversity mean to you?
- In what ways do you think you are different or unique?
- How do you feel being different from others?

STEP 8

The activity ends by inviting students to encourage one another by saying something nice to each other about their different traits.

	LESSON 3 – Celebra-ting Intercul-turalism by Learning About and Playing Ethnic Music	**STEP 1** The teacher introduces the students to the concept of ethnic music. A fruitful discussion takes place. **STEP 2** The teacher presents to students 10 distinct music compositions from the 5 continents of the world. • Ethiopian jazz music • American blues music • Arabian, Middle Eastern music • Italian opera music • French tango music • Spanish flamenco music • Greek syrtaki music • Indian music • Asian music • Jamaica reggae music **STEP 3** The teacher presents short audio clips of the aforementioned musical styles, having the class match which one is the correct one. **STEP 4** The teacher pass out handouts to students with basic information about what is ethnic music and some words about each of the aforementioned music genres. **STEP 5** The teacher requests from students to read it loudly in the classroom. **STEP 6** Once the handout is read, the teacher requests from students to discuss the following topics: Where does ethnic music get its name? What does represent each music style? What benefits do you think arising from listenting to ethnic music? STEP 7 The teacher split the students in groups of four or six requesting from each group to choose 1 music genre among the recommended ones. STEP 8 The teacher distributes musical instruments to students asking them to start reproducing the music genre they chose. It is not essential for students to know how to play a musical instrument. The point is to try to reproduce the sound as much as they can and feel the experiential learning.

PART 3 OF SCENARIO

BENEFITS	Art-based teaching is considered a very creative and interactive education method to help students learn more easily about different cultures, civilizations and traditions; in other words, learn about the 'Other'. Detailed benefits are presented in the learning outcomes' section
RISKS AND SUGGESTED SOLUTIONS	Teaching interculturalism though art, apart from capturing students' imagination and creating enthusiasm, can also hide risks that should be identified prior to the beginning of the lessons. Below, a number of potential risks that might affect the smooth flow of the lessons are presented: • toxic and carcinogenic materials (e.g., crayons etc.) that can be ingested, inhaled or absorbed through the skin • possible injury during the crafts activities (e.g. with the scissors) • poor collaboration between students • hesitation to talk about personal opinions on interulturalism In order to manage the above possible risks, some suggested solutions follow: • checking the ingredients included in the materials prior to their distribution (e.g., crayons etc.) • safety instructions reminders • emphasizing the important values of team building and teamwork • constantly encourage students to talk about interculturalism and express their personal points of views. Listening carefully without interrupting them.

PART 1. OF SCENARIO

TITLE	Young Storytellers Project
MAIN SUBJECT	HUMANITIES
OTHER SUBJECTS/DISCIPLINES	Rhetoric, Anthropology, Literature, Theatrical Studies, Psychology, Creative learning, Emotional intelligence
TYPE	*Young Storytellers Project is an educational project suitable for language, literature, and art classes included in the school curriculum. It is also recommended for vocational guidance classes, especially in the case of high school. It addresses teachers of secondary schools, educators, and methodological centers staff.*
DURATION OF CLASSES	4 lessons of 90 minutes in duration
AGE OF STUDENTS	Students between the ages of 13 – and 18 years old.

PART 2. OF SCENARIO

AIM OF CLASSES	Contemporary societies constantly call for innovative approaches in all aspects of life to include experience-based and creative approaches that stimulate people's willingness to learn and engage more robustly in the education process. Under this scope, several innovative approaches have already been introduced in the learning and teaching environment including digital tools, arts, culture, etc. In the Young Storytellers Project, the power of Storytelling is presented, as a form of art that **can transmit knowledge** effectively and emotionally, creating a significant impact on a knowledge base on several topics. Storytelling is the art of using language, communication, emotivity, vocalization, the psychology of movement (body language, gestures, and facial expressions), and the abstract construction of elements and images of a particular story for a specific audience. A crucial aspect of storytelling is feedback from or connection with the audience to demonstrate a decisive visual event that offers details of the story in a creative manner (National Storytelling Association, 1997). Under this scope, this project is an introduction to the Storytelling method accompanied by **several tips for teachers** on how to encourage students to tell memorable stories, the presentation of the teacher's role in the storytelling approach, the ways to engage students, and the benefits deriving from its use and the presentation of successful activities already used in the classroom environment.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	By the end, students will: • Be aware of the storytelling's value in attributing meaning and in the interpretation of human activities. • Know that storytelling is an evolutionary mechanism for human beings. • Realize that storytelling is the oldest form of teaching. • Understand that storytelling is a powerful component of communication. • Be taught and practice storytelling techniques. • Learn how to deconstruct the main points of a story. • Learn how to synthesize a story.
	IN THE FIELD OF SKILLS	By the end, students will be able to: • Pay attention and actively listen to their classmates. • Think critically. • share their thoughts and emotions • Show Empathy • Understand and follow the instructions • Play roles and characters • Use their voice tone, language, expressions, and body motion accordingly depending on their scope. • Reflect on a story. • Collaborate to deconstruct, compile and structure stories. • Enjoy the process of playing
	IN THE FIELD OF SOCIAL COMPETENCES	By the end, students will have learned how to: • Narrate a catchy story through different techniques. • Interpret an object and attribute meanings. • Accept feedback • Provide feedback • Identify and accept their emotions and others' emotions, too. • Communicate their emotions and ideas. • Manage their time. • Focus on a task, while working in a team.

TEACHING METHODS	The project is based on a student-based approach and thus, combines many different teaching methods: • **Checking-in/out activities**: They invite students to be present, seen, and heard. Checking in emphasizes presence, focus, and group commitment; checking out emphasizes reflection and closure (lesson 2). • **Warm-up activities**: They get students engaged, and provide them with new interesting ways to work together and connect (lesson 1). • **Teamwork and teambuilding**: Encouraging teamwork in lessons creates stronger bonds among classmates. The individual members respect each other and their differences and share common goals and expectations (lessons 1, 2) • **Facilitation**: The teacher works mostly as a facilitator rather than a tutor.The facilitator does not perform the task but uses certain skills in a process that allows students to reach their decision/set their goals/and learn a skill. He/she helps students to learn how to learn rather than teaching them (lessons 1, 2, 3, 4). • **Observation**: The project offers time for students to observe their classmates and learn from each other (lessons 1, 2, 3, 4). • **Brainstorming**: Students are encouraged to focus on a topic and contribute to the free flow of ideas (lessons 1, 2, 3) • **Game-based learning**: It is a teaching method that allows learners to explore different parts of games as a form of learning. The use of cards, competition, role plays, etc. creates fun and motivation while setting up and following the rules of a game enhances students' imagination (lessons 2, 3, 4). • **Storytelling**: It is a teaching method, itself, given that it is a highly effective tool for building up new knowledge and learning a variety of 21st-century skills (lessons 1, 2, 3, 4).
SUGGES-TED TEACHING TOOLS/ MATER-IALS NEEDED	The design of the project requires the following tools/materials to be used during the implementation: • Cards • Worksheets • Video • Stories However, there is space to apply additional teaching tools and material to further enhance the designed activities. Some of them are: • PowerPoint presentations • Ted Talks • Documentaries • Books • Fairytales • Stories records • Props (when storytelling) • Musical instruments (when storytelling)

PRELIMINARY CONDITIONS (if applicable)	*Students are able to effectively participate in the process without special preliminary conditions.*
TIPS / METHODOLOGICAL REMARKS	In this project, storytelling has two-fold dimensions: It is both the topic of the project, itself, and, on a second level, it is the methodology used to achieve the learning outcomes (in terms of knowledge, skills, and competencies). As a methodological tool, the teacher of the classroom uses it to an extensive degree to enhance the educational experience of the students, and engage and motivate them. Moreover, the teacher of the classroom is the first and the most direct role model that students to practice their storytelling skills, when their turn comes. Thus, specific tips and methodological remarks should be taken into account by the teacher: In the case when the teacher **chooses** a story to tell to the classroom: (action of selecting) **Tip #1**: Every story needs a direction (knowing the ending beforehand), emotion, and meaning (a key message to move your audience). Choose stories that have these elements! **Tip #2**: Remember that you need a character that creates empathy: someone that is in danger or that is the victim of a catastrophe; that is the best in its class or has great power. This character should invite students to take action, that is, "what do I want my students to do with the message of the story?" **Tip #3**: The character has to undergo a transformation; that goes from a comfort zone to an obstacle or problem that disrupts the order. Finally, the character succeeds or fails to solve the problem, which transforms the character morally. In the case when the teacher **tells** a story to the classroom, that needs to be memorable: (action of telling a story – performing) **Tip #4**: Commit yourself to the story and your audience. **Tip #5**: Use voice modulation and dramatize. **Tip #6**: Tell your stories with gestures, body language, and movement. **Tip #7**: Create mental images through descriptions made with all the senses. **Tip #8**: Make eye contact with each of your students to emphasize what is important. **Tip #9**: Encourage interaction through questions. **Tip #10**: Keep a journal and write down all the stories that come your way.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	*"Human beings are marked by stories and experiences that shape their way of thinking. Language forms the basis for our understanding of life as a sequence of memories and anecdotes that someone narrates to build communication in societies or cultural groups".* Edu Trends Storytelling 2017, p 5 Lesson 1 aims to introduce this fundamental principle of storytelling to students. To do that it uses the Theory of Interpretation taken from the field of Archaeology and Museum Studies. The interpretation states that every object has a story, sometimes many. Moreover, it is interesting to observe that very often, the story adds significant value to the object. For example, anybody who is asked to talk about the most meaningful object he owns delivers a story — *"this old trunk belonged to Grandpa; we bought that tacky coffee mug on our honeymoon"*, and so on. The relationship between the possessions people value and the narratives behind them is unmistakable. Students get into the process of interpreting objects in the classroom and recognize how much stories make the objects around them meaningful and valuable. Following that, they reflect on the places where stories exist and they realize that we are all surrounded by stories every day. The news on television, radio, and in the newspaper is nothing but stories. The Bible and other religious books are full of stories. The lessons teachers give in school are often stories. Songs tell stories. Pictures tell stories. Movies tell stories. Comedians make up their routines with stories. When children tell a friend about something that happened to them, they are telling a story! • Having identified the value of stories in the interpretation of daily life, students explore the mini ages of storytelling (lesson 2). Through the use of cards and role-plays activities, students pass through the milestones of the stories' evolutionary line: They imagine the daily routine of human ancestors about 40,000 years ago and think about the nomadic tribes who migrated seasonally, following edible animal species, picking fruits and roots, and even using rudimentary stone tools. Back then, an ancient hunter drew a picture of a bison on a cave wall to tell his neighbors about food opportunities in the vicinity, fixing in our human DNA the compulsive desire to tell stories to one another. When Neanderthals painted on cave walls they told visual stories. They were people of very few words and the stories they told were all about survival: filling their stomachs, avoiding dangers, in other words, filling people's needs. [card 1] • 10,000 years later, ancient Greek epic poets such as Homer recited poems stories, and spoken words, sometimes talking for hours. How did he keep audiences interested? Well, he "spiced" his Odyssey with audience-pleasing elements: e.g. the hero Odysseus battles the one-eyed monster Cyclops, he's with the fetching magical goddess Circe, etc. These elements made the story compelling and Homer took his place in the annals of history. [card 2]

LEARNING CONTENT - DETAILED CHARACTERISTICS	• Storytelling received its next big shot in the arm around the fifth century when early forms of handcrafted books were produced in small batches in Rome. These masterpieces represent some of the world's earliest stories told in classic book form through written words. [card 3] • A thousand years later, in Shakespeare's time, a large number of people still couldn't read so didn't understand some of his eloquent words. The playwright wisely filled his works with great writing for the heads of the intellectuals of the day and body scenes in humor for everyone to enjoy. Shakespeare appealed to the head and the heart engaging a wide variety of audiences turns out that is a good strategy for telling stories even today (storytelling through performing arts). [card 4] • A thousand years later, in Shakespeare's time, a large number of people still couldn't read so didn't understand some of his eloquent words. The playwright wisely filled his works with great writing for the heads of the intellectuals of the day and body scenes in humor for everyone to enjoy. Shakespeare appealed to the head and the heart engaging a wide variety of audiences turns out that is a good strategy for telling stories even today (storytelling through performing arts). [card 4] • 300 years later in the Industrial Age sophisticated technologies were leveraged to create storytelling machines through the invention of motion pictures and radio broadcasting. Movies open simultaneously around the country making it possible to tell one story to mass audiences. That made storytelling big business. Radio aired hilarious comedies and thrilling dramas with refreshing little one-minute breaks called commercials delivered through wireless technology. Movies and radio were shared events either in audience-packed movie palaces or home living rooms where the whole family crowded around the radio receiver. [card 5] • 50 years later storytelling science was growing rapidly, blending the optical genius of movies and electronic technology with the birth of Radio in yet another news story platform, the television: a single-eyed monster to rival Homer Cyclops. **Brand storytelling** in which advertisers promoted to consumers nationwide reached its zenith through TV spots. Pundits dubbed this brave new world after World War 11: the golden age of television. However, there was only one big problem with the miracle of TV: unless you owned a broadcast network or were a huge corporation that could pay for the airtime, nobody could afford to tell their story on television. As in any good story, a stranger always comes to town to rescue law-abiding citizens from the bad guy. The hero who tamed the "Goliath" of expensive exclusive brand storytelling on television was of course the internet. [card 6]

LEARNING CONTENT - DETAILED CHARACTERISTICS	• Nowadays, in the computer age with web video on the Internet, we have the perfect storm: a technology democratically available to just about anyone to use all the methods developed during the mini ages of storytelling:
	  ◦ Visual stories
	  ◦ Spoken words
	  ◦ Written words
	  ◦ Wide audiences (performing arts)
	  ◦ Shared Events (TV & radio)
	  ◦ Brand storytelling
	[card 7]
	
	Now students have deconstructed the concept of storytelling in the view of its historic development and the time for practice has come. Lessons 3 and 4 focus on a series of methodologies used in order to break down the elements that make the narration of a story attractive, effective, and fun.
	
	Lesson 3 puts the spotlight on the use of orality (narrative voice) and the use of the senses and the body expressions. Good storytellers often talk about an event with a grimace on their face, the raising of an eyebrow, or a cold stare. These theatrics sell the story. They create a compelling visual. These methods paint the picture in the students' mind's eye about the non-verbals occurring in a scene alongside the five senses. These are technics that help the teacher tell the story and encourage students to use them, in their turn, while creating an atmosphere of mutual trust, in which everyone identifies with each other, and it stimulates active listening and collaboration to compile and structure new stories.
	
	Lesson 4 emphasizes the "Story Mountain". A story mountain is a way of visually planning the plot and structure of a story, by separating the plot and structure into clear stages or sections. This is done by following the path of the main character up one side of a mountain to the climax of the story at the peak, then down the other side with the resolution. Students practice the technique on a story mountain template, where they can fill in the box for the opening, build-up, dilemma, resolution, and closing of their story. It's a fantastically illustrated story planning worksheet, great for inspiring students and helping them to engage with their imaginations.
	Story mountains and story maps are often based on the famous story structure of the **Hero's Journey**.

BASIC TERMS	• **Interpretation**: Interpretation is the act of explaining, reframing, or otherwise showing your own understanding of something. • **Storytelling**: Storytelling is the art of using language, communication, emotivity, vocalization, the psychology of movement (body language, gestures, and facial expressions), and the abstract construction of elements and images of a particular story for a specific audience. • **The Story Mountain**: A story mountain is a way of visually planning the plot and structure of a story, by separating the plot and structure into clear stages or sections. This is done by following the path of the main character up one side of a mountain to the climax of the story at the peak, then down the other side with the resolution

		• **The Hero's Journey**: It is a common template for story-telling. It was first described by the anthropologist Edward Burnett Tylor in 1871, who studied a number of classic folk tales, myths, and stories. He found that many of these followed a similar pattern of events. The Hero's Journey template can be applied to any story in which the protagonist embarks upon an adventure, wins a victory, and then returns transformed.
STRUC-TURE	LESSON 1	**STEP 1: Warm-up activity: What am I?** The teacher asks a student to describe in 2 minutes an object in the classroom in great detail without saying what it is. The rest students listen carefully and get 3 guesses to figure out the object. The activity is repeated for 4 different objects in the classroom. **STEP 2: Object storytelling:** The teacher split the students into 4 teams and each team prepares a catching story for one of 4 different objects identified in step 1. One by one, the 4 teams narrate the story of their object and a discussion is following on the feelings, emotions, thoughts, etc. these stories provoked in the listeners. -Did the stories give meaning to the objects? -Did the stories make objects more valuable than their technical description? -What are the benefits of telling stories? **STEP 3:** The teacher encourages students to bring to mind personal items which are important to them. What kind of stories are related to these objects? Students share personal stories about objects they love, in a circle. **STEP 4:** The teacher calls students to identify places or circumstances of their daily life where storytelling exists. All the ideas are concentrated on the whiteboard and students reflect on them. Where did storytelling originate?
	LESSON 2	CHECK IN ACTIVITY: The teacher asks How are you feeling today? Students one-by-one describe in 1-2 words how they feel right that moment. STEP 1: The teacher distributes 7 cards to the students and asks them to observe them and describe the types of storytelling depicted on them. Then he/she asks students to put the cards in chronological order, guess the history (evolutionary progression) of storytelling and narrate it. STEP 2: Students are divided into 3 groups and each group is assigned 2-3 of the 7 cards. Time is given to the groups in order they create a sketch for each card (10 minutes for each card – 20 to 30 minutes in total - requires time management by the students). STEP 3: Students present their sketches to the whole class, in the chronological order of the cards (around 5 minutes/sketch).

	LESSON 2	**STEP 4:** The story of storytelling is presented in video format. **CHECK OUT ACTIVITY:** One word before leaving. The teacher asks students to describe their feelings (before they leave the room) in one word. – "Please share with us in one word how you are feeling now, at the end of this lesson."
	LESSON 3	**STEP 1:** The teacher reads a paragraph of a story, any story of his/her preference. He/she keeps his/her voice at the same level without, going high or low or loud or soft. He/She just says it flat. Does the story sound interesting? What is missing? (15 minutes) **STEP 2:** Reflection Time: the teacher discusses with the students the components of a good story: • What are the key features of a well-told story? • How does a storyteller develop a story to prepare it for an audience? • How can a storyteller develop and refine his/her storytelling ability? (Discuss different tones in the voice, motion, expressions, use of props, costumes, music, etc.) **STEP 3:** Now students know that storytelling is more than reading the words of a story out loud. It takes other skills as well. The teacher invites them to practice these skills. Students are asked – one by one- to pick one piece of paper from a box (prepared by the teacher), read the messages/instructions written on it out loud, and perform accordingly. **STEP 4:** The teacher asks a student to read again the paragraph of the story used in step 1, but this time, to enrich storytelling with different tones and expressions.
	LESSON 4	**STEP 1:** The teacher hands out a short story to students and the "Story Mountain" worksheet. One of the students is asked to read the short story out loud. **STEP 2:** The teacher presents the "Story Mountain" to the students. It is a tool to layout the main points of a story. Students are invited to make notes about the points on the lines provided on the story mountain worksheet, regarding the short story of the lesson. Using the story mountain with notes, they tell again the story out loud. **STEP 3:** Students are asked to think of a short story regarding their name. It may come from the imagination or be a real one. They use the story mountain to lay out the main points of their story. **STEP 4:** Students present their short stories to the classroom using all the storytelling techniques that have been taught. The presentation takes the form of a competition, resulting in 3 storytelling winners.

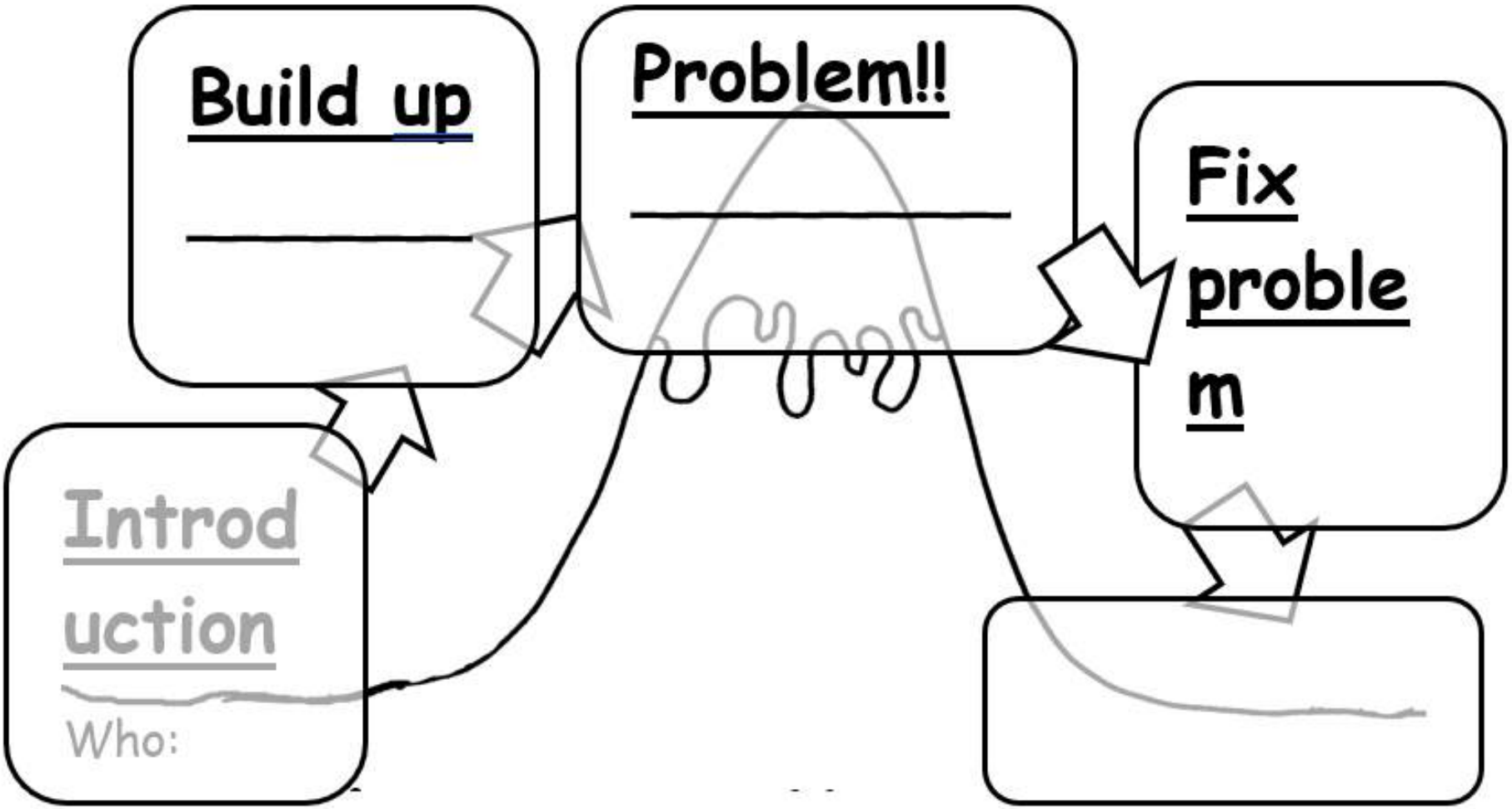
PART 4. OF SCENARIO

BENEFITS	• The benefits of implementing the Young Storytellers Project in the classroom are the followings. The scenario: • Facilitates recall or easy access to memorization. • Links emotions and empathy. • Promotes reflective learning. • Promotes the use of thinking and dialogue comprehension management. • Encourages critical thinking. • Inspires and motivates the audience. • Generates and builds knowledge and information, based on the experience of others. • Drives identity based on group characteristics or multicultural communities. • Provides the adoption of diverse points of view. • Helps to transfer the storyteller's emotions, feelings, and experiences to the spectators or audience. • Enhances linguistic communication competency. • Encourages the use of ICT resources and multimedia devices. • Favors content and information currency (endures or evolves). • Heightens students' creativity and imagination. • Facilitates the adaptation of new procedures in educational practice.
RISKS AND SUGGESTED SOLUTIONS	Storytelling researchers (applied to higher education) indicate that there are two recurrent issues in the classroom when implementing scenarios like the one of the Young Storytellers Project: • the distance that can emerge between theoretical models and the outside world, and • the possible impersonal nature of the learning model, in which instructor and students lack interpersonal ties (Ribeiro, Moreira, and Pinto da Silva, 2014). To deal with these challenges, the following suggestions may be taken into account: • Be well aware of the theoretical models. • Contextualize theory in students' real experiences. • Act as a facilitator rather than an instructor/teacher. • Think creatively and innovatively. • Use imagination. • Create a safe environment for sharing stories, sometimes of a personal nature. • Encourage storytelling

THE YOUNG STORYTELLERS PROJECT
LESSON 3
STEP 3
The following messages/instructions should be written on different pieces of paper:

- Count from 1 to 10 as if you were an angry parent who said "I am going to count to 10 and if you are not in the bedroom by the time I get to 10, you are in big trouble"
- Count from 1 to 10 as a very little child just learning to count
- Count from 1 to 10 as if you were very sad because you thought everyone had forgotten your birthday, but then you walked into your living room and saw 10 birthday presents sitting on the floor. How would he/she count them?
- Count from 1 to 10 as if you were a referee for a boxing match and he/she was counting someone out.
- Count from 1 to 10 as if you were telling someone a telephone number when the phone was not working right.
- Walk across the room pretending that you are coming home from school and you know you have a lot of chores to do when you get there.
- Walk across the room pretending that you are walking through a foot of snow.
- Walk across the room pretending that you are walking barefoot in a very sticky, squishy swamp.
- Walk across the room pretending that you are walking across a blistering hot desert.
- Walk across the room pretending that you are in a graveyard at night walking through the tombstones.
- Walk across the room pretending that your right leg is in a cast.
- Walk across the room pretending that you are walking through honey.

If more instructions are needed the teacher may invent similar ones.


Build up
Problem!!
Fix proble m
Introd uction
Who:

PART 1. OF SCENARIO

TITLE	THE ART OF CRIME
MAIN SUBJECT	NATURAL SCIENCES, ENGLISH, PSYCHOLOGY
OTHER SUBJECTS/DISCIPLINES	CHEMISTRY, BIOLOGY
TYPE	*Single lessons*
DURATION OF CLASSES	4 lessons x 90 minutes
AGE OF STUDENTS	15 - 18

PART 2. OF SCENARIO

AIM OF CLASSES	**Lesson 1: Dactyloscopic examination, differences in fingerprint structure, forensic dactyloscopic examination.** **Aims:** • I can describe the structure of a fingerprint, • I know the basic concepts associated with fingerprint identification • I know and understand the difference between different fingerprints • I can analyze my fingerprints, • I can print my fingerprints on a dactyloscopy card • I know and describe techniques for securing dactyloscopic traces • I describe physical and chemical methods for revealing traces. • I give an example of a forensic case solved by fingerprint analysis. **Lesson 2 Psychological analysis of serial killers.** **Aims:** • I know the definition of a serial killer • I can identify the differences between a serial killer and a mass murderer • I know the basic types of serial killers • I describe the behavior of the organized and unorganized killer • I know the profiles of the most famous serial killers. **Lesson 3 Bloodstain analysis, examination and disclosure of biological traces.** **Aims:** • I know the types and kinds of biological traces • I describe the mechanism of formation of bloodstains

<table>
<tr><td>AIM OF CLASSES</td><td colspan="2">

I examine and describe the most common bloodstains
I understand the need to examine bloodstains at the scene of a forensic event
I distinguish between types of bloodstains

Lesson 4 Victimological analysis, predisposition to being a victim of crime. Stockholm syndrome.

Aims:

I know and understand what victimology is
I describe the predisposition to victimology
I know the terms: victim, violence, kidnapping, assault
I know the conditions necessary for the occurrence of the Stockholm syndrome in a victim
I describe the causes and effects of the Stockholm syndrome

</td></tr>
<tr><td rowspan="2">LEARNING OUTCOMES</td><td>IN THE FIELD OF KNOWLEDGE</td><td>

knowledge of basic concepts of forensic science, criminology and victimology
knowledge of basic dactyloscopic techniques
ability to construct basic forensic profiles of serial killers
ability to analyze specific cases and draw general conclusions
consolidating vocabulary and grammar rules concerning forensic science
knowledge of the mechanisms of bloodstain formation
knowledge of the basics of victimology and analysis of predispositions to be a victim of crime
knowledge of forensic terminology
knowledge of the manifestations of the Stockholm syndrome

</td></tr>
<tr><td>IN THE FIELD OF SKILLS</td><td>

ability to find information from various sources
ability to separate important from less important information
ability to interpret the given information
ability to use the given information to solve problem tasks
ability to interpret recordings, videos, podcasts and graphical charts and tables
ability to evaluate Internet sources for usefulness and factual correctness
time management skills

</td></tr>
</table>

	IN THE FIELD OF SOCIAL COMPETENCES	• ability to solve tasks in a group • ability to use the strengths and weaknesses of individual group members • ability to share responsibilities among group members • ability to communicate with each other
TEACHING METHODS	working with multimedia materials, elements of a lecture group work, discussion, solving problems with the use of scientific sources, using various sources of knowledge to solve problems	
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	YOUTUBE LINKS: LESSON 1: • Forensic Fingerprint || Types, Patterns, Principles, Structure of Fingerprint || Quiz on Fingerprint- https://www.youtube.com/watch?v=SjUNI6sUviq • How to Compare Fingerprints - The Basics https://www.youtube.com/watch?v=1rpTqKkgygA • Forensics Expert Explains How to Lift Fingerprints https://www.youtube.com/watch?v=00NfQcGd-uE LESSON 2: • Criminologist Reviews Serial Killers From Movies & TV | Vanity Fair https://www.youtube.com/watch?v=29n2bv7F6uc • A Serial Killer Profiler Explains the Minds of Murderers https://www.youtube.com/watch?v=JbHq6U5DL0w LESSON 3: • Forensics Expert Explains How to Analyze Bloodstain Pattern https://www.youtube.com/watch?v=0jltioeaEy4 • Blood Stain Pattern Analysis Demo https://www.youtube.com/watch?v=0jltioeaEy4 • The science of blood spatter https://www.youtube.com/watch?v=01wynsOvLAq LESSON 4: • Helpless: Victims of Stockholm Syndrome https://www.youtube.com/watch?v=o4eo1qnwisQ • The Bank Heist Origins of Stockholm Syndrome https://www.youtube.com/watch?v=gsUTKEb1n_0 • 5 Chilling Cases of Stockholm Syndrome... https://www.youtube.com/watch?v=WBh9E37b67E	

	OTHER TEACHING TOOLS: coloured A4 sheets, internet connection, multimedia board or projector, cell phones
PRELIMINARY CONDITIONS (if applicable)	• general knowledge of biology and chemistry (elementary school level) • basic knowledge of human psychology • basic knowledge of forensic science • ability to translate basic words, phrases and grammatical forms from English • basic information technology skills (elementary school level) • basic ability to search for information on the Internet • basic interest in the subject
TIPS / METHODOLOGICAL REMARKS	• giving creative freedom • individual approach to the student and the subject

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Lesson 1** **Topic: "Dactyloscopic examination, differences in fingerprint structure, forensic dactyloscopic examination".** The student will: • understand what genes are and be able to explain how genetic information is associated with a particular trait in an organism; • describe the structure of a fingerprint • define the terms: dermatoscopy, dactyloscopy, fingerprint, fingerprints • analyze their fingerprints and imprint their fingerprints on a dactyloscopic card • describe techniques for preserving dactyloscopic traces • know the basic principles of dactyloscopy • cite physical and chemical methods of revealing traces • know an example of a forensic case • create a practical glossary of basic dactyloscopy terms **Lesson 2** **Topic: Psychological analysis of serial killers** The student will: • know the definition of a serial killer • identify the differences between a serial killer and a mass murderer • know the basic types of serial killers • describe the behavior of the organized and unorganized killer • know the profiles of the most famous serial killers.

<table>
<tr><td></td><td colspan="2">Lesson 3
Topic: Bloodstain analysis, examination and disclosure of biological traces

The student will:

• know the types and kinds of biological traces
• describe the mechanism of formation of bloodstains
• examine and describe the most common bloodstains
• understand the need to examine bloodstains at the scene of a forensic event
• distinguish between types of bloodstains

Lesson 4
Topic: Victimological analysis, predisposition to being a victim of crime. Stockholm syndrome

The student will:

• know and understand what victimology is
• describe the predisposition to victimology
• know the terms: victim, violence, kidnapping, assault
• know the conditions necessary for the occurrence of the Stockholm syndrome in a victim
• 1 describe the causes and effects of the Stockholm syndrome</td></tr>
<tr><td>BASIC TERMS</td><td colspan="2">forensic science, criminology, victimology, perpetrator, victim, dactyloscopy, fingerprints, forensic event, serial killer, blood palms, blood, bloodstain analysis, Stockholm syndrome</td></tr>
<tr><td>STRUC-TURE</td><td>LESSON 1</td><td>STEP 1 (5 minutes)

• The teacher greets the students and then presents the topic and objectives of the lesson:
• Topic: "Dactyloscopic examination, differences in fingerprint structure, forensic dactyloscopic examination".

STEP 2 (25 minutes)

• The teacher presents students with one of the previously selected films available at the link at the top.
• The teacher asks the students to make their own notes with the most important information during the film.
• After watching the video the students get into groups of several people (e.g. groups of four).
• They compare what they have gathered from the film, share what they understood from the film and what they found difficult or didn't understand.</td></tr>
</table>

	LESSON 1	**STEP 3 (10 minutes)** Then the teacher asks the students a question in the form of a true or false quiz. Students raise their hand if they agree with the teacher's statement. Sample questions: • No two fingerprints are the same! (T) • The index finger of the right and left hand have the same fingerprint lines! (F) • The fingerprints change over the course of a lifetime! (F) • A person can only be identified by fingerprints! (F) • Twin brothers have the same fingerprints! (F) • It is impossible to erase fingerprints! (T) • Only people have fingerprints (F) **STEP 4 (30 minutes)** • The teacher prints from the website: https://www.edo.cjis.gov/artifacts/standard-fingerprint-form-fd-258-1.pdf – the appropriate number of fingerprint cards corresponding to the number of students • Each student uses paint or ink poured on a bandage or sponge to make his/her fingerprints • The teacher shows each group how to correctly and legibly print their fingerprints on the fingerprint card • Students compare their fingerprints, finding similarities and differences. • Each student comes up to the teacher and prints any one finger on a blank piece of paper. Only one student prints two prints, one on a shared sheet, one print on a separate sheet. The students' task is to identify who the fingerprint on the separate sheet belongs to. • The task can be done in groups. **STEP 5 (10 minutes)** Students make a glossary of expressions related to dactyloscopy and translate the words from English into their native language. The teacher checks and corrects the students' work. **STEP 6 (5 minutes)** For homework, students are to find the most interesting movies or TV series with the theme of fingerprint examination. They write their suggestions and watch the series on colored sheets.

		STEP 7 (5 minutes) Summing up phase: Shotgun Shield. The purpose of this method is to get feedback very quickly. On the shooting target hanging in the classroom, the pupils mark their "shots" on a scale from 0 to 10 using small colourful sticky notes. The circle can be divided into parts where different aspects of the work can be assessed, e.g. usefulness, attractiveness, difficulty level of the material, engagement of students, interest in the topic, degree of mastery resulting from the lesson's objectives, etc. The teacher may refer to this in general terms as part of the summative assessment
	LESSON 2	**STEP 1 (5 minutes)** • Curiosity and Discussion. The teacher introduces the topic and objectives of the lesson: Psychological analysis of se-rial killers. • Recognizing students' background knowledge. The teacher informs the students that they will work by brainstorming. He writes the word serial killer on the board and asks the students: What are the characteristics of a serial killer? • The teacher assigns one student to write the ideas on the board. The students give their suggestions. After the creative phase, there is a joint review of the ideas. **STEP 2 (20 minutes)** • The teacher presents the students with one of the previously selected films available at the link at the top. • The teacher asks the students to make their own notes with the most important information during the film. • They compare what they have gathered from the film, share what they understood from the film and what was difficult or not understood. They compare the information gathered on the board with their own notes. **STEP 3 (30 minutes)** • The teacher randomly divides the students into four groups. Each group is given strip-cut characteristics of organized and unorganized serial killers by the teacher. Each group, is to assign each characteristic to a particular type of murderer. • The teacher supervises the whole process of students' work and verifies the correctness of the task in each group. The teacher may reward students by evaluating their work. • At the end, the students present their division and make an argument. During the presentation, the other students take notes of their classmates' conclusions.

		Example characteristics: Characteristics of an Organized Murderer: • The age of the organized criminal is close to that of the victim and ranges from 18 to 45. • He is a man who is married or involved with a partner; • Usually a high school graduate and sometimes a college graduate. Has a history of disciplinary problems at school, primarily due to unjustified acts of violence against others. • Lives at an average economic level. • Comes from a good family; his father held a steady job and raised his son unseasonably. • He lives at a greater distance from the scene. The exception to this may be the first more-duration, which he often commits near his home. • His residence is neglected. • He often has done military service, and it happens that he was a volunteer. During his service, however, he has had disciplinary problems and may have been dismissed. • He is able to do any job, but is looking for one that will allow him to demon-strate his self-image as a strong man. So he chooses professions such as truck driver, bartender, security guard, policeman, and may also take jobs that bring him into contact with blood and death. • Changing jobs or leaving town are not a problem for him. • He can be affable, handsome and smells of good toilet water. • He is usually well built and cares about his appearance. • He establishes contacts easily and inspires confidence. • It is possible that he has been convicted of violent and sexual offenses that may be sadistic in nature. He enjoys causing harm to people he is angry with. • Commits traffic violations and does not pay fines or parking tickets. Drives a mid-range car that is well maintained and clean. • He maintains control during the murder, drinks alcohol before the crime, and feels stressed during the act of murder itself. • He also follows all reports from crime scenes. • His intelligence quotient is average to above average. • The organized killer plans his future crimes. • The source of his intentions lies in fantasies that have been building up over the years. • Most of the victims are strangers to the perpetrator, so he patrols the neighborhood in search of people who fit his fantasies. Ted Bundy sought young women, while David Berkowitz sought girls sitting alone or in male company in parked cars. To lure their victims, they often used deception. John Wayne Gacy offered money to young homosexuals in exchange for having sexual intercourse in his home. • The organized killer does not depersonalize his victims. Treating them as objects is not helped by talking to them. • Adaptation to the situation and mobility are characteristics of the organized killer.

		• In doing so, it is important to note that psychopaths have a higher fear threshold. The heart rate in psychopaths is low, as is the temperature of their skin, and they feel terror less intensely than other people. The autonomic nervous system in highly violent people is sluggish. They need higher levels of stimulation or excitement to make their sensations intense. • The organized criminal, being able to adapt to any environment, has a chameleon-like personality. • He is a womanizer and a pathological liar. • He has no sense of guilt and does not change his behavior as a result of punishment. • He may possess a murder weapon kit, which also includes objects and means for incapacitating victims. • The precipitating factors for criminal actions are usually problems with women, money, and job loss. • The murderer acts with premeditation. He is particularly concerned with his own safety. He meticulously covers his tracks and disposes of his victims' bodies. • He collects his victims' trophies. • In case of unfavorable circumstances, he is able to stop himself from committing a murder. • He can communicate with the authorities. Sometimes encourages the police by giving some information about his plans. This type of action reinforces the perpetrator's sense of superiority over the police. He feels particularly encouraged by the apparent lack of success in the investigation, and finds great pleasure in formulating his messages in such a way as to frustrate and ridicule the authorities. • He may belong to circles under surveillance by the police in order to gain information about the case. As a result, he or she is sometimes considered to be a whistleblower or a troublemaker. Occasionally, he becomes personally involved in the investigation, such as when searching for the victim's body. • He almost always moves in his own vehicle or one taken from the victim. • He usually has intercourse with a living victim, using all forms of rape. Even if he is impotent, by beating, stabbing, or strangling the victim, he can achieve sexual gratification. He seeks dominance and power over the victim, so he often brings the victim to a critical moment, then stops the torture to keep the victim alive for a while longer. **Characteristics of the disorganized murderer** • He ranges in age from 16 to about 30 years old. • He selects his victims at random, regardless of age. • He is also male, but this time unmarried. • He has dropped out of high school or has been expelled from school. His intelligence quotient is below average.

		• He comes from a lower social class, his father worked odd jobs or was unemployed. • He was brought up under strict discipline. • As a rule, he does not work, but if he is employed somewhere, he performs uncomplicated tasks, in which social contacts are limited. So he takes jobs like that of a watchman, a dishwasher, or a warehouse assistant. • He has not done any military service, or if he has, he has been discharged from it because he is unfit. • He has most likely already been cited for fetish theft, begging, or exhibitionism. • As a rule, he does not own a car, but if he does have one, it is an old model that looks like a junker. • When he commits a murder, he loses control and feels no stress. • Does not drink or drinks only a small amount. • Lives near the crime scene – usually alone or with parents. • May be treated for depressive conditions, but is not hospitalized. • He is usually thin or skinny, and suffers from ailments that affect his physical appearance. • He finds it difficult to change his lifestyle. • Shows a lack of interest in the progress of the investigation • A disorganized offender is anti-social. • Enjoys a nocturnal lifestyle. He sometimes visits cemeteries and has no friends. • He does not choose his victims logically, and they are often people who may even pose a threat to him. • The corpses of the victims may bear signs of a struggle. Victims are depersonalized – the perpetrator does not want to know who they are. • Until the perpetrator is apprehended, it is impossible to discern any logic in his behavior. • As a rule, he moves on foot or uses public transportation. • He does not have his own fixed instruments of crime. He may take a knife found in the victim's apartment, kill him with it, then put it back, leaving it at the crime scene. He does not worry about fingerprint marks. • As a rule, he does not take the corpse from the crime scene because the degree of mental disorder does not allow him to do so. • He is usually unable to have intercourse with the victim, and if he succeeds, it is only with a dead or completely unconscious victim. • Kills almost immediately after kidnapping. • He acts impulsively and is incapable of giving up the satisfaction of his urges. • The scene is usually messy, cluttered, and profusely flooded with blood. • The perpetrator leaves a lot of visible marks. • May perform post mortem injuries to the victim. • Manifestations of cannibalism are possible. • Specific behaviors that differ from the offender's everyday behavior often manifest after the crime

		STEP 4 (20 minutes) • The students' task is to find on the Internet the profiles of 2 or 3 most famous serial killers from the country and abroad and assign them to the appropriate category of serial killer. **STEP 5 (minutes)** • Students make a glossary of expressions related to the psychology of a serial killer and translate the vocabulary from English to their native language. The teacher checks and corrects the students' work. **STEP 6 (5 minutes)** • For homework, students are to find the most interesting films or series with the theme of action and psychology of a serial killer. They write down their suggestions and watch the series on coloured cards. **STEP 7 (5 minutes)** • Summing up phase: Pocket and drawer. The teacher distributes sticky notes to the students. The class leader draws a pocket on the board and writes next to it: "What do I take with me?". Here the pupil has to write down what he/she got out of the class, what appealed to him/her in particular, what he/she liked or what will be useful in the future. Below, the teacher draws a drawer and a white spot. Next to the drawer write-down: "What won't be useful to me?" and next to the white spot: "What was missing?". The pupils fill the drawings below with sticky notes with short sentences, sentence equivalents or key words. This is also an opportunity to analyze the course of the lesson and make a quick repetition.
	LESSON 3	**STEP 1 (5 minutes)** Curiosity and Discussion. The teacher introduces the topic and objectives of the lesson: Bloodstain analysis, examina-tion and disclosure of biological traces. **STEP 2 (20 minutes)** The teacher presents the students with one of the previously selected films available at the link at the top.

		• The teacher asks the students to make their own notes with the most important information during the film. • They compare what they have gathered from the film, share what they understood from the film and what was difficult or not understood. They compare the information gathered on the board with their own notes. **STEP 3 (25 minutes)** • Students divide into several groups, each group's task will be to prepare artificial blood. • Students go to the link: https://www.thesprucecrafts.com/make-fake-blood-fake-blood-recipes-1105964 they choose one method of obtaining blood and take the appropriate reagents and equipment. • The whole work is supervised by the teacher. The teacher can choose a different method for each group. **STEP 4 (25 minutes)** • Students use artificial blood to investigate its behaviour, e.g. how a drop of blood behaves when dropped on a white sheet of paper from different heights, or how the angle of incidence affects the shape of a drop of blood, or how a drop of artificial blood behaves when dropped on different types of surface. Students record their observations and comments. **STEP 5 (5 minutes)** • Students make a glossary of expressions related to bloodstain analysis and translate the words from English into their native language. The teacher checks and corrects the students' work. **STEP 6 (5 minutes)** • As a homework assignment students are to find the most interesting films or TV series with the theme of bloodstain analysis. They should write down their suggestions and watch the series on coloured cards. **STEP 7 (5 minutes)** • Summing up phase: At the end, the teacher uses a tool to assess the students' mastery of knowledge and skills using a thermometer. On the scale of tempe-rature the students mark with sticky notes how much they have mastered the issues resulting from the lesson's objectives. If the scale shows a low level of temperature, the students think about how to increase their level of knowledge.

	LESSON 4	STEP 1 (10 minutes) • Curiosity and discussion. The teacher asks students the question, "Who is a victim"? • Identifying students' background knowledge. Students try to explain who a victim is and what their characteristics are. • During the brainstorming of the whole class team, the teacher asks. Out of the proposed equations, the teacher chooses the one that is written down correctly • The teacher gives the topic of the class Victimological analysis, predisposition to being a victim of crime. The teacher gives the topic of the lesson Victimological analysis, predisposition to being a victim of crime. STEP 2 (15 minutes) • Then the students work in pairs. One student reads on the Internet what Stockholm syndrome is and tries to explain in his/her own words to the other student what it is. At the same time, the other student reviews examples of specific descriptions of Stockholm syndrome without knowing what the mechanism is. One student has theoretical knowledge and the other student has the application of this knowledge on concrete cases, their goal is to synthesize their knowledge. The task is designed to develop cooperative skills, inquisitiveness, and to stimulate dy-dactic abilities in students. The teacher corrects and answers students' specific questions. STEP 3 (20 minutes) • The teacher presents to the students one of the previously selected films available at the link at the top. • The teacher asks the students to make their own notes with the most important information during the video. • They compare what they have gathered from the film, share what they understood from the film and what was difficult or not understood. They compare the information gathered on the board with their own notes. STEP 4 (10 minutes) • The teacher explains what the phenomenon of victimology is and what this science deals with. He shows the division of victims and discusses specific cases and types of victims

Types of victims according to Stephen Schafer

- Persons who are not in any relationship with the perpetrator and the perpetrator only takes the opportunity,
- persons, who are in a relationship with the perpetrator, for example family relations (domestic violence)
- provocateurs who with their clothes, behavior, carelessness contribute to crime,
- accelerating victims, who often initiate criminal events,
- biologically weak due to age, gender, health, socially weak victims, who are treated as less valuable (easier to sacrifice or "not sorry" to give them a hard time)
- self-actualization victims (these are people who have previously been perpetrators of a crime and are also experiencing stigma, naive, eager for easy gains
- burdensome victims (these are people who overly impose themselves with something, who "do not let live", e.g. a shyster perpetrator sees no other way to get rid of the problem but to eliminate the individual)
- inconvenient victims (in turn, these are people who thwart or may thwart someone's plans: a witness or co-perpetrator of a crime, a partner in business, a spouse who does not agree to a divorce, etc.)

Types of victims according to Benjamin Mendelsohn:

- Innocent victim (e.g. one who waits at a traffic stop and is injured when a drunken driver who is being prosecuted hits the stop)
- A victim of his/her own ignorance (e.g. people staying in " places, walking around after dark
- Victim as much at fault as the perpetrator (e.g. pseudo football fans fighting after a game)
- Victim more culpable than offender (e.g. troublemaker at play, disco, initiating fights, conflict situations)
- Victim solely to blame for the crime (e.g. road pirate who has an accident, electricity thief)

STEP 5 (20 minutes)

The teacher divides the class into 4 groups. The task of each group will be to answer one of four questions. Based on the teacher's lecture, notes, film screening, and materials collected about the Stockholm syn-drome:

- How not to become a victim?
- Who most often becomes a victim?
- What is Abel syndrome?
- Did Bella from the fairy tale of "Beauty and the Beast" suffer from Stockholm Syndrome?

		Students write down their suggestions and after a moment of deliberation present their findings other students can add their ideas and comments. **STEP 6 (5 minutes)** • The students make a glossary of expressions connected about victimology and victims and translate the words from English into their native language. The teacher checks and corrects students' work. **STEP 7 (5 minutes)** As a homework assignment students are to find the most interesting films or TV series with the theme about victimology and victims. They are to write down their suggestions and watch the series on coloured pieces of paper. **STEP 8 (5 minutes)** Summing up phase: On the board with a drawn battery and marked levels of its charge, e.g. every 5-10%, students mark to what extent they have mastered the issues arising from the lesson objectives to be achieved. If the battery is not 100% charged, they should think about how to improve their knowledge.

PART 4. OF SCENARIO

BENEFITS	• develop analytical thinking skills; • develop social skills; • develop reading and listening skills with understanding ones; • develop the ability to read data from tables, graphs, etc; • develop the skills of active listening and analysis of film fragments • develop knowledge in the field of forensics and criminology
RISKS AND SUGGESTED SOLUTIONS	RISKS • Internet access is required, and students must also have Internet access, cell phones are required, technical problems may occur, it is good for the teacher to be prepared for this eventuality; • some topics may be too difficult for students who require more time to master some of the content in the lesson, such students should receive special attention; • web links may no longer be valid SUGGESTED SOLUTIONS • **in case of technical problems it is good to have printed materials ready, students can work with the text or with the textbook, not necessarily with videos;**

	• provide attention to students who are having difficulty understanding the material; form groups so that better students help weaker students (peer support) or provide materials in advance so that students have time to review them (the 'flipped classroom' approach); • check the links before the lesson to see if they work, if they don't, find something similar.

GENETIC CROSSES - HOW DO THEY WORK?

PART 1. OF SCENARIO

TITLE	THE ART OF CRIME
MAIN SUBJECT	NATURAL SCIENCES
OTHER SUBJECTS/DISCIPLINES	MATH
TYPE	*Single lessons*
DURATION OF CLASSES	4 lessons x 45 minutes
AGE OF STUDENTS	15 - 18

PART 2. OF SCENARIO

AIM OF CLASSES	**Lesson 1** **Aims:** • I understand what genes are and I am able to explain how genetic information is related to a given feature of an organism; • I can define terms such as allele, heterozygous, dominant homozygous, recessive homozygous; • I know the basic principles of classical Mendelian genetics; • I quote Mendel's laws. **Lesson 2** **Aims:** • I can illustrate Mendel's first law on the example of a monohybrid punnett square crossings; • I can solve simple monohybrid punnett square crossings exercises. **Lesson 3** • **Aims:** • I can illustrate Mendel's second law on the example of dihybrid punnett square crossings; • I can solve simple dihybrid punnett square crossings exercises. **Lesson 4** **Aims:** • I explain the phenomenon of complete dominance, incomplete dominance and codominance; • I can illustrate the phenomenon of codominance on the example of a monohybrid punnett square crossings; • I can illustrate the phenomenon of incomplete dominance on the example of a monohybrid punnett square crossings.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• knowledge of basic concepts of genetics • knowledge of the basic rules of inheritance of features • ability to solve different types of genetic crosses • ability to calculate the probability of occurrence of an individual with given traits • consolidating knowledge of theory of probability and calculation of proportions and percentages • knowledge of the mechanisms of human sex inheritance and sex-linked traits • knowledge of the basics of genetic diseases
	IN THE FIELD OF SKILLS	• ability to find information from various sources • ability to separate important from less important information • ability to interpret the given information • ability to use the given information to solve problem tasks • ability to interpret charts, graphs and tables • ability to use basic mathematical operations to solve problems in other areas of study • ability to evaluate Internet sources for usefulness and factual correctness • time management skills
	IN THE FIELD OF SOCIAL COMPETENCES	• ability to solve tasks in a group • ability to use the strengths and weaknesses of individual group members • ability to share responsibilities among group members • ability to communicate with each other

TEACHING METHODS	group work, discussion, elements of a lecture, solving problems with the use of different scientific sources, class discussion, using various sources of knowledge for solving problems, working with multimedia materials
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	YOUTUBE LINKS: • What is a gene? - https://www.youtube.com/watch?v=5MQdXjRPHmQ • What is an Allele? Quick Definition - https://www.youtube.com/watch?v=FsaYSGWuRmo • How Mendel's pea plants helped us understand genetics - Hortensia Jiménez Díaz - https://www.youtube.com/watch?v=Mehz7tCxjSE • Monohybrid Cross Examples - GCSE Biology (9-1) - https://www.youtube.com/watch?v=XId3-Fr9oUU • Dihybrid Cross Explained - https://www.youtube.com/watch?v=fe5kSSs83qc • Genetics - Dominance and Its Types - Lesson 8 | Don't Memorise - https://www.youtube.com/watch?v=Bo1 alIG CheM Other links: • What does DNA do? | Facts | yourgenome.org - https://www.yourgenome.org/facts/what-does-dna-d0 • DNA<->RNA->protein - http://biomodel.uah.es/en/lab/cybertory/analysis/trans.htm • Monohybrid punnett squares - exercises and answers - https://docs.google.com/document/d/1rIWVffrw2HqEC8eFPcjQdhZ4W7H6dN-wCrqX0w8HCX4/edit?usp=sharing • Dihybrid punnett squares - exercises and answers - https://docs.google.com/document/d/1m2n4kTEmuhbxceaqJduzIF-En0qucmG4GI3Uz0m4zHo/edit?usp=sharing • Incomplete dominance and codominance - exercises and answers - https://docs.google.com/document/d/1HkLpGmskNbjLA2VtBsPSshWcwWBSqN2qqs145uq0PgM/edit?usp=sharing • coloured A4 sheets • internet connection • multimedia board or projector • cell phones

PRELIMINARY CONDITIONS (if applicable)	• general knowledge of biology of living systems (elementary school level) • basic knowledge of cell structure (elementary school level) • basic knowledge of the chemical basis of life (especially proteins and nucleic acids, elementary school level) • ability to calculate proportions, fractions, percentages, and calculus of probability (elementary school level) • basic information technology skills (elementary level)
TIPS / METHODOLOGICAL REMARKS	The teacher must be aware that the discussed topics may cause problems for students who need more time to understand more difficult issues. If problems arise, it is recommended to extend the time to implement presented scenario.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Lesson 1** **Topic: "The basic principles of heredity"** Student will: • understand what genes are and will be able to explain how genetic information is related to a given feature of an organism; • be able to define terms such as allele, dominant allele, recessive allele, heterozygous, dominant homozygous, recessive homozygous; • know the basic principles of classical Mendelian genetics; • be able to quote Mendel's laws. **Lesson 2** **Topic: "Mendel's first law"** Student will: • be able to illustrate Mendel's first law on the example of a monohybrid punnett square crossings; • be able to solve simple monohybrid punnett square crossings exercises. **Lesson 3** **Topic: "Mendel's second law"** Student will: • be able to illustrate Mendel's second law on the example of dihybrid punnett square crossings; • be able to solve simple monohybrid punnett square crossings exercises.

		Lesson 4 **Topic: "Deviation from Mendel's laws"** Student will: • be able to explain the phenomenon of complete dominance, incomplete dominance and codominance; • be able to illustrate the phenomenon of codominance on the example of a monohybrid punnett square crossings; • be able to illustrate the phenomenon of incomplete dominance on the example of a monohybrid punnett square crossings.
BASIC TERMS		gene, genetic information, allele, heterozygous, dominant homozygous, recessive homozygous, classical Mendelian genetics, Mendel's laws, monohybrid punnett square crossings, dihybrid punnett square crossings, complete dominance, incomplete dominance, codominance, human biological sex determination, probability estimation

STRUC-TURE	LESSON 1	**STEP 1**
		
		• The teacher greets the students, then presents the topic and aims of the lesson
		  ◦ Topic: "The basic principles of heredity"
		  ▪ I understand what genes are and I am able to explain how genetic information is related to a given feature of an organism;
		  ▪ I can define terms such as allele, dominant allele, recessive allele, heterozygous, dominant homozygous, recessive homozygous;
		  ▪ I know the basic principles of classical Mendelian genetics;
		  ▪ I quote Mendel's laws.
		
		STEP 2
		
		• The teacher presents the students the video available at the link: What is a gene?. During the video, students are asked to take their own notes with essential key information.
		• After watching the video, students team up in groups of several people (for example, groups of four). The group's task is to come up with the best definition of a gene. Students may use their own notes.
		• Individual groups write their answers on colored A4 sheets of paper. These sheets are taped on the board in the classroom. The teacher reads the answers of each group. He/She points out the well covered issues first. Then, he/she gives feedback to each group on the information they still need to include in their definition. Students have a moment to make any corrections.

The correct definition of a gene should be written roughly as follows:

Gene is a basic unit of heredity and a sequence of nucleotides in DNA that encodes the synthesis of a gene product, either RNA or protein.

Based on the information available at the link What does DNA do? | Facts | yourgenome.org , the previously established groups are now tasked with determining the amino acid sequence of a protein based on a fragment of ribonucleic acid (mRNA - messenger RNA). The mRNA is synthesized on the basis of a DNA strand. It also contains information about the structure of the protein. Groups receive the following nucleotide sequences: AUG CCU GGG AAG UAU GUC AGG CGA CCC CUG AUA AGC GGA UAG. First, let them use the "Amino acid code" table available at the above mentioned link. Later, let them compare the results using the online "Transcription and Translation Tool" found at the link: DNA<->RNA->protein. Groups write their answers on colored A4 sheets of paper. These sheets are taped on the board in the classroom. The teacher checks the correctness of the completed task.

The correct answer as follows:
Methionine Proline Glycine Lysine Tyrosine Valine Arginine Arginine Proline Leucine Isoleucine Serine Glycine STOP [MPGKYVRRPLISG STOP]

Stage 3

- The teacher presents the students the video available at the link: What is an Allele? Quick Definition. During the video, students are asked to take their own notes with essential key information.
- After watching the video, students team up in groups. The group's task is to come up with the best definition of an allele. Additionally, they have to write how alleles affect the gene pool of a population and how they arise. Students may use their own notes.
- Individual groups write their answers on colored A4 sheets of paper. These sheets are taped on the board in the classroom. The teacher reads the answers of each group. He/She points out the well covered issues first. Then, he/she gives feedback to each group on the information they still need to include in their definition. Students have a moment to make any corrections.

The correct answer should be written roughly as follows:
Allele is one of two, or more, forms of a given gene variant. New alleles increase genetic variety of the population, by increasing its gene pool. Gene mutations provide new alleles, making these mutations the ultimate source of variation.

	Stage 4 • Students team up in groups. The group's task is to come up with the best definition of: dominant allele, recessive allele, heterozygous, dominant homozygous, recessive homozygous. They can use cell phones. The definition is meant to be simple and clear. • Individual groups write their answers on colored A4 sheets of paper. These sheets are taped on the board in the classroom. The teacher reads the answers of each group. He/She points out the well covered issues first. Then, he/she gives feedback to each group on the information they still need to include in their definition. Students have a moment to make any corrections. The correct answer should be written roughly as follows: *Dominance is the phenomenon of one variant (allele) of a gene on a chromosome masking or overriding the effect of a different variant of the same gene on the other copy of the chromosome. The first variant is termed **dominant** and the second **recessive**.* ***Homozygous dominant** is a biological term used to describe individuals who possess two copies of a dominant allele of a particular gene or genes.* ***Homozygous recessive** is a biological term used to describe individuals who possess two copies of a recessive allele of a particular gene or genes.* ***Heterozygous** is a biological term used to describe individuals who possess two different alleles of a particular gene or genes.* Stage 5 At the end part of the lesson the teacher presents the students the video available at the link: How Mendel's pea plants helped us understand genetics - Hortensia Jiménez Díaz. During the video, students are asked to take their own notes with essential key information. They will be necessary during the next lesson. Summarizing the lesson, recalling the most important information in the context of planned aims of the lesson, greeting the students.

LESSON 2	Stage 1
	
	• The teacher greets the students, then presents the topic and aims of the lesson:
	  ◦ Topic: "Mendel's first law
	  ▪ I can illustrate Mendel's first law on the example of a monohybrid punnett square crossings;
	  ▪ I can solve simple monohybrid punnett square crossings exercises.

		Stage 2 • If the teacher finds it necessary, he/she can show the video from the previous lesson available at the link: How Mendel's pea plants helped us understand genetics - Hortensia Jiménez Díaz. During the video, students are asked to revise their previous notes. • Students are asked to find lists of dominant and recessive traits in humans. Then, they can describe their classmate in terms of which trait he/she possesses, e.g. blue eyes - recessive trait, ability to roll tongue - dominant trait etc. • The teacher presents the students the video available at the link: Monohybrid Cross Examples - GCSE Biology (9-1). During the video, students are asked to take their own notes with essential key information. • After watching the video, the teacher solves one or two sample tasks related to this topic. He/She informs the students that they can ask questions now to clear up any doubts, as they will work without the teacher's help later. • Students team up in groups of several people (for example, groups of four). The group's task is to solve the following tasks about monohybrid punnett squares in groups (time needed to complete the task - about 20 minutes): Monohybrid punnett squares - exercises and answers • The teacher asks each group to present a solution to one selected exercise. Together they discuss the mistakes, make corrections with the participation of everyone in the class. Pupils exchange their experiences. They point out the skills they have already mastered and those that need further practice and work. • Summarizing the lesson, recalling the most important information in the context of planned aims of the lesson, greeting the students.
	LESSON 3	Stage 1 • The teacher greets the students, then presents the topic and aims of the lesson: ◦ Topic: "**Mendel's second law**" ▪ I can illustrate Mendel's second law on the example of dihybrid punnett square crossings; ▪ I can solve simple dihybrid punnett square crossings exercises.

		Stage 2 • If the teacher finds it necessary, he/she can show the video from the previous lesson available at the link: How Mendel's pea plants helped us understand genetics - Hortensia Jiménez Díaz. During the video, students are asked to revise their previous notes. • Students are asked to find lists of dominant and recessive traits in pet animals. Then, they can describe their pets in terms of which trait it possesses, e.g. curled ears - dominant trait (cats), long hair - recessive trait (dogs) etc. They can even show pictures of their pets that they have on their cell phones! Stage 3 • The teacher presents the students the video available at the link: Dihybrid Cross Explained. During the video, students are asked to take their own notes with essential key information. • After watching the video, the teacher solves one or two sample tasks related to this topic. He/She informs the students that they can ask questions now to clear up any doubts, as they will work without the teacher's help later. • Students team up in groups of several people (for example, groups of four). The group's task is to solve the following tasks about dihybrid punnett squares in groups (time needed to complete the task - about 20 minutes): Dihybrid punnett squares - exercises and answers • The teacher asks each group to present a solution to one selected exercise. Together they discuss the mistakes, make corrections with the participation of everyone in the class. Pupils exchange their experiences. They point out the skills they have already mastered and those that need further practice and work. • Summarizing the lesson, recalling the most important information in the context of planned aims of the lesson, greeting the students.
	LESSON 4	**Stage 1** • **The teacher greets the students, then presents the topic and aims of the lesson:** ◦ **Topic: "Deviation from Mendel's laws"** ▪ **I explain the phenomenon of complete dominance, incomplete dominance and codominance;**

	LESSON 4	**I can illustrate the phenomenon of codominance on the example of a monohybrid punnett square crossings;** • **I can illustrate the phenomenon of incomplete dominance on the example of a monohybrid punnett square crossings.** Stage 2 • The teacher presents the students the video available at the link: Genetics – Dominance and Its Types – Lesson 8 | Don't Memorise. During the video, students are asked to take their own notes with essential key information. • After watching the video, students team up in groups of several people (for example, groups of four). The group's task is to come up with the best definition of a complete dominance, an incomplete dominance and a codominance. Students may use their own notes. • Individual groups write their answers on colored A4 sheets of paper. These sheets are taped on the board in the classroom. The teacher reads the answers of each group. He/She points out the well covered issues first. Then, he/she gives feedback to each group on the information they still need to include in their definition. Students have a moment to make any corrections. The correct definition of a complete dominance should be written roughly as follows: *Complete dominance is a form of dominance in the heterozygous condition wherein the allele that is regarded as dominant completely masks the effect of the allele that is recessive.* The correct definition of an incomplete dominance should be written roughly as follows: *The incomplete dominance is referred to as the dilution of the dominant allele with respect to the recessive allele, resulting in a new heterozygous phenotype.* The correct definition of a codominance should be written roughly as follows: *Codominance means that neither allele can mask the expression of the other allele.*

		Stage 3 • After completing the tasks, the teacher solves one or two sample exercises related to this topic. He/She informs the students that they can ask questions now to clear up any doubts, as they will work without the teacher's help later. • Students team up in groups of several people (for example, groups of four). The group's task is to solve the following tasks about an incomplete dominance and a codominance punnett squares in groups (time needed to complete the task – about 20 minutes): Incomplete dominance and codominance – exercises and answers • The teacher asks each group to present a solution to one selected exercise. Together they discuss the mistakes, make corrections with the participation of everyone in the class. Pupils exchange their experiences. They point out the skills they have already mastered and those that need further practice and work. • Summarizing the lesson, recalling the most important information in the context of planned aims of the lesson, greeting the students.

PART 4. OF SCENARIO

BENEFITS	• develop analytical thinking skills; • develop social skills; • develop reading and listening skills with understanding; • develop the ability to calculate probability and perform simple mathematical calculations; • develop the ability to read data from tables, graphs, etc; • develop knowledge of classical genetics and basic biological laws.
RISKS AND SUGGESTED SOLUTIONS	RISKS • Internet access is required, and students must also have Internet access, cell phones are required, technical problems may occur, it is good for the teacher to be prepared for this eventuality; • some topics may be too difficult for students who require more time to master some of the content in the lesson, such students should receive special attention; • web links may no longer be valid

	SUGGESTED SOLUTIONS • in case of technical problems it is good to have printed materials ready, students can work with the text or with the textbook, not necessarily with videos, teacher can also download videos and play them off-line; • provide attention to students who are having difficulty understanding the material; form groups so that better students help weaker students (peer support) or provide materials in advance so that students have time to review them (the 'flipped classroom' approach); • check the links before the lesson to see if they work, if they don't, find something similar.

PART 1. OF SCENARIO

TITLE	Natural Based Solutions
MAIN SUBJECT	NATURAL SCIENCES
OTHER SUBJECTS/DISCIPLINES	English, Science, ICT and Art
TYPE	*larger educational project/study visit/*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	15 - 18

PART 2. OF SCENARIO

AIM OF CLASSES	• To encourage students to learn and care about climate change and take cautions via Natural Based Solutions (NBS). • To gain consciousness about sustainability. • To let students understand the reason why Earth is considered the "water planet". • To analyze how much of Earth's water is available for humans to use for life-sustaining purposes, and explore the concept of water scarcity in both physical and economic terms. • To set up the focus on: the concept of water footprints. Students will explore how water footprints are an invaluable tool for identifying patterns of water use so that individuals, businesses, and even nations can more effectively manage their use of one of the most precious resources on Earth: water. Critical to this exploration is a visit to https://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/ , where students calculate their personal water usage, analyze the results, and set a base point for tracking and conserving their water use. • To learn how to take actions and embed these actions into their daily lives via nature-based solutions. They will also learn about waste management and footprints of products.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	*"Nature-based solutions (NBS) are solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services."* *https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en* *Natural-Based Solutions are introduced briefly.* Students can: • Become more mindful of their daily direct water use, encouraging them not to waste water. • Gain a greater global perspective and to cultivate students' awareness and understanding of indirect (virtual) water use. • Promote conversation about how food choices and shopping habits have a larger impact on water consumption than students may realize. They do this by introducing the concept of water footprints and helping students understand how they use water beyond the tap.
	IN THE FIELD OF SKILLS	Students can: • Gain critical thinking and problem solving (the ability to ask the right questions). • Explore how you can make sustainable choices when shopping. • Access and analyze information to find nature based solutions. • Improve their digital competences ;using canva, mentimeter etc. • Feed their curiosity and imagination • Learn to learn • Gain citizenship competence as trying to find solutions for a universal problem. • Think creatively
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: • Communicate effectively • Interact with peers in a variety of ways and contexts and maintain positive relationships with peers and teachers. • Understand others' needs and feelings, articulating one's own ideas and needs. • Collaborate to understand and try to find solutions for a universal problem – climate change. • Make decisions on what to do and how to do during the activities. • Respect personal space

TEACHING METHODS	Project-based learning: Students get fact-based tasks, problems to solve and they work in groups Lifelong learning: Students gain consciousness about real-time and future problems. Collaborative learning: There will be a strong focus on group work. Game-based learning: Learning is mixed with games Outdoor education: Learning outside of the school building in the "real" environment
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Platforms and tools: Mentimeter, Kahoot, Canva, Storyjumper For evaporation experiment:*2 clear plastic cups, felt marker, clear plastic wrap, water Audiovisual presentation equipment with access to the Internet. Student access to computers, smart phones, and/or tablets, and the Internet Worksheets
PRELIMINARY CONDITIONS (if applicable)	*No conditions must be fulfilled*
TIPS / METHODOLOGICAL REMARKS	To build a sustainable society, education is critical. Making sure to provide future citizens with all the needful skills has always been a challenge for educators. Now that our world is continuously changing, the only way to assure that education institutions are well aligned with contemporary needs is to follow well-designed frameworks that present versatile skill-sets as guides.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Social sciences, ICT, art, English** • Up-to-date topics encouraging lifelong learning: environmental issues interest all people from all ages. Students will be more conscious of their daily direct water use, encouraging them not to waste water when brushing their teeth, washing dishes, showering, etc. • Student-centered activities: Students are responsible for their own learning. • Team integration: For mind-mapping activity students will work in groups. • Cooperative skills: They will cooperate to create their e-book or work on footprints. • Stimulation of creative thinking: Brainstorming activity, playing online NBS game or designing canva works will stimulate students creativity • Digital competences: Kahoot game, canva, mentimeter and storyjumper will boost their digital competences. • Self-learning: While working on an evaporation experiment or playing online games students will lead their own learning.

BASIC TERMS	Climate change, nature-based solutions, water consumption, sustainability	
STRUC-TURE	LESSON 1	**STEP 1 (5') Brainstorming on the topic** Starting with assessing the former knowledge of what students know and realize about Greta Thunberg. Is Greta Thunberg an influencer of your generation? Will it be interesting to you to help her in the campaign? - Polling activity to assess their attitude and have some ideas to start debate (see Annex 1) **STEP 2 (15') Introduction** Watching the video of Greta - Greta video https://www.conservation.org/video/nature-now-video-with-greta-thunberg - with subtitles given as a hand-out (see in Annex 2) Helping with vocabulary if needed Clarification of unknown meanings Summarizing the message delivered through video: We have a collective duty to respect nature; nature must play a key role in reducing greenhouse gas emissions, urban heating, and other climate change challenges caused by human intervention. **STEP 3 (5') Debate** Giving space to students to react and express what they think and how they feel about the message in the video. Leading questions: Why is it important to run such a campaign? What would you do if you were the leader of the campaign? What means of campaigning will you use? – collecting ideas **STEP 3 (20') Mind Mapping** Divide students in 3 groups and each group is going to draw the mind map of the answers to their question: Group No 1: What climate changes and disasters do we face? Group No 2: What might be done to protect our planet? Group No 3: What environmental problems will we face in the future? **STEP 4 Display** All three elaborated mind maps should be displayed in the classroom for students to have visual memorizing of the previous lesson outcomes.
	LESSON 2 in ICT Labora-tory	**STEP 1 (15') What are Nature-Based Solutions?** The main aim of this session is to explain the meaning of the acronym NBS by reading Annex 3 and watching a six minutes video

		https://www.youtube.com/watch?v=paVTJtgGFFU from IIED explaining the fundamental importance of nature-based solutions to the hazards and impacts of climate change. **STEP 2 (15') Producing an e-book** Working in groups students will create a book with what they learn throughout this class with the online tool StoryJumper. **STEP 3 (15') NBS online game** This session will ends with a NBS online game http://game.think-nature.eu/
	LESSON 3	**STEP 1 (5') Water Management** The teacher will explain what is water management in relation with NBS (see Annex 4) **STEP 2 (5') Mentimeter – Water Footprint** Annex5 To introduce Water Footprint and to catch students attention more and let them do a search on google, the teacher releases a mind mastering activity. Annex 5 **STEP 3 (35') Water Management** The goal of this activity is to provide students with an in-depth understanding of key water issues. Students learn key facts about water resources and water footprints and then use a water calculator to identify and analyze their personal direct and virtual water consumption. The lesson gives students a foundation of knowledge and helps them understand why they should care about protecting water resources. Once students understand why the issue is important, it is easier for them to make a fundamental shift in attitude about their water use. Annex 6 The teacher invites students to think like scientists and produce some solutions, especially using the data that they will get from official authorities of their town. They will also have a look at the link below to see different samples being applied. https://naturvation.eu/nbs/roma/city-science **Step 4 Home Assignment**: Evaporation Experiment To learn how water evaporates and disappears, each student does the experiment at home under the guidance of the teacher. Annex 7

		Available at: https://www.canva.com/design/DAEVfDH8V1s/9U1hvX4H5SHne3-avV81_g/ediT
	LESSON 4	**Step 1 (25') Footprint** Every product has a water footprint and that water footprint lands in one or more places in the world. The size of the water footprint lets us know how much of our limited water resources that product has claimed and whether it could be made more efficiently. Students check the footprints of products Creating the game: 'How much water costs our meal' Annex 8 **Step 2 (10') A kahoot game can be played** **Step 3 (10') Canva Design** Students design some posters on canva to raise awareness and get attention of other students, teachers or stakeholders Annex 9

PART 4. OF SCENARIO

BENEFITS	• Becoming more conscious about nature based solutions against climate change and understanding the fact and importance of water footprint. • Learning through many innovative tools.
RISKS AND SUGGESTED SOLUTIONS	- Some of the activities especially in lesson 3 might be removed if it is too long. + The scenario is applicable both for classroom and virtual teaching.

Annex 1: Survey for students

1) Is Greta an influencer of your generation? Yes/No

2) Would it be interesting for you to help her in her campaign?

3) What sentence would characterize her best? Choose only one sentence. [*Note for teacher: there is no one correct answer. This is to spark debate*]

a. She is brave

b. She knows what to fight for

c. She wants the best for our planet

d. She is stubborn

e. She is determined

4) What makes people spread fake news about her? [Open question]

5) How positively do you feel about her campaign? Will she succeed in making our planet a better place to live? (1 not very positive/5 absolutely positive)

6) What do you think her book title "No one is too small to make a difference" means? [Open question]

Annex 2: Transcript of video 1

Handout material: Text from the video. This transcript was done by the author of the Scenario.

Supporting material for Lesson 1:

Watching the video – with subtitles given as a spreadsheet:

Greta: This is not a drill. My name is Greta Thunberg. We are living in the beginning of a mass extinction. Our climate is breaking down. Children like me are giving up their education to protest. But we can still fix this. You can still fix this. To survive, we need to stop burning fossil fuels, but this alone will not be enough. Lots of solutions are talked about but what about a solution that is right in front of us? I will let my friend George explain.

George: There is a magic machine that sacks carbon out of the air, costs very little and builds itself. It is called a tree. A tree is an example of a NATURAL CLIMATE SOLUTION. Mangroves, peat bogs, jungles, marshes, seabeds, kelp forests, swamps, collar reefs, they take carbon out of the air and lock it away. Nature is a tool we can use to repair our broken climate. These natural climate solutions could make a massive difference.

Greta: Pretty cool, right?

George: But only if we also leave fossil fuels in the ground.

Greta: Here is the crazy part.... Right now, we are ignoring them. We spend 1000 times more on global fossil fuel subsidies than on natural-based solutions.

George: Natural climate solutions get just 2% of all the money used on tackling climate breakdown.

Greta: This is your money. It is your taxes and your savings.

George: Even more crazy, right now when we need nature the most, we're destroying it faster than ever.

Greta: Up to 200 species are going extinct every single day.

George: Much of the arctic ice is gone, most of our wild animals have gone, much of our soil has gone.

Greta: So, what should we do?

George: **What should YOU do?**

Greta: It is simple, we need to PROTECT, RESTORE and FUND. PROTECT – tropical forests are being cut down at the rate of 30 football pitches a minute.

George: Where nature is doing something vital, we must protect it.

Greta: RESTORE- much of our planet has been damaged,

George: But nature can regenerate, and we can help the ecosystem bounce back.

Greta: FUND

George: **We need to stop funding things that destroy nature and pay for things that help it.**

Greta: It is that simple PROTECT, RESTORE, FUND

George: This can happen everywhere; many people have already begun using natural climate solutions, we need to do it on a massive scale.

Greta: You can be part of this.

George: **VOTE for people who defend nature.**

Greta: SHARE this video, talk about this.

George: **All around the world there are amazing movements fighting for nature. JOIN them.**

Greta: Everything counts. What you do counts.

Annex 3: Nature-Based solutions

The concept of nature based solutions (NBS) emerges from other ideas such as protecting ecosystems or tackling environmental and climate challenges. NBS are designed to bring more nature and natural features and processes to cities, landscapes while supporting economic growth, job creation and human wellbeing.

The EU defines nature-based solutions to societal challenges as" solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource efficient and systemic interventions. Nature based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services.

FIGURE1: IMAGE OF THUY HA BICH PIXABAY, HTTPS://PIXABAY.COM/ES/PHOTOS/VISTA-PAISAJE-NATURALEZA-VIETNAM-2843338/

NBS can help tackling several key challenges:

1. Climate mitigation and adaptation
2. Water management
3. Disaster risk reduction
4. Green spaces and urban regeneration
5. Public health, wellbeing and air quality
6. Participatory planning and governance
7. Social justice and social cohesion
8. Economic opportunities and green jobs

Annex 4: Water management

Water management is the control and movement of water resources to minimise damage to life and property and to maximize efficient beneficial use. Cities and towns are facing real water challenges. A recognition of ongoing urban water management challenges, brought to front of mind during the millennium drought, and furthermore through local flooding and water pollution events.

A good water management plan should include:

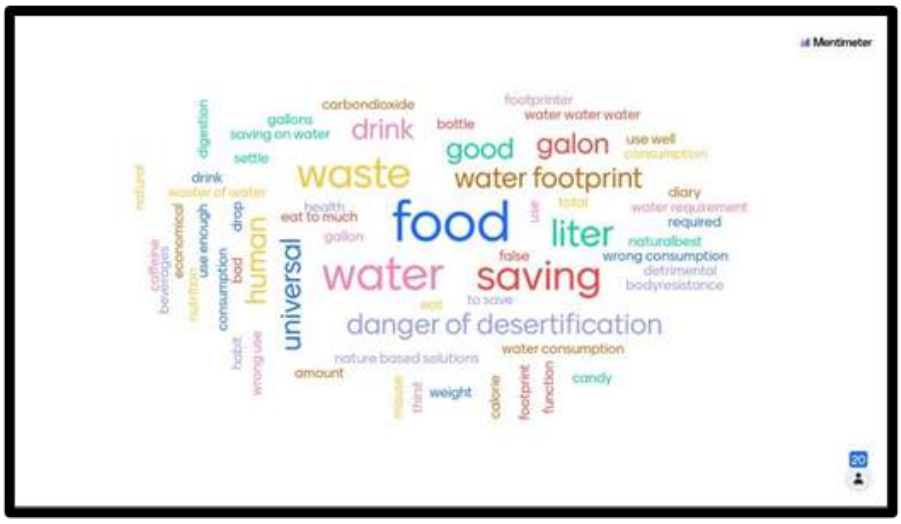
- Sustainable water-use plan, to provide access to clean drinking water and improve community health.
- Integrated water management strategy, restoring degraded terrestrial ecosystems and improving living conditions for wild species.
- Flood and drought studies, to reduce the risk of floods and droughts
- Stormwater management plan, like in the case study "Cloudburst Management Plan" Copenhagen https://oppla.eu/casestudy/18017

Annex 5: Water Footprint

To introduce Water Footprint, the teacher shares the presentation from https://waterfootprint.org/media/downloads/WFN_presentation_schools.pdf

To catch students attention more, students calculate their water footprint at : https://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/

Then the teacher lets the students do a search on google, and the teacher releases a mind mastering activity.



Annex 6:

The teacher asks the question :

What is a water footprint?

Everything we use, wear, buy, sell and eat takes water to make.

The water footprint measures the amount of water used to produce each of the goods and services we use. It can be measured for a single process, such as growing rice, for a product, such as a pair of jeans, for the fuel we put in our car, or for an entire multi-national company. The water footprint can also tell us how much water is being consumed by a particular country – or globally – in a specific river basin or from an aquifer.

The water footprint is a measure of humanity's appropriation of fresh water in volumes of water consumed and/or polluted.

The water footprint allows us to answer a broad range of questions for companies, governments and individuals. For example:

- Where is the water dependence in my company's operations or supply chain?
- How well are regulations protecting our water resources?
- How secure are our food or energy supplies?
- Can I do something to reduce my own water footprint and help us manage water for both people and nature?

Direct and indirect water use:

The water footprint looks at both direct and indirect water use of a process, product, company or sector and includes water consumption and pollution throughout the full production cycle from the supply chain to the end-user. It is also possible to use the water footprint to measure the amount of water required to produce all the goods and services consumed by the individual or community, a nation or all of humanity. This also includes the direct water footprint, which is the water used directly by the individual(s) and the indirect water footprint – the summation of the water footprints of all the products consumed.

The three water footprints:

- **Green water footprint** is water from precipitation that is stored in the root zone of the soil and evaporated, transpired or incorporated by plants. It is particularly relevant for agricultural, horticultural and forestry products.

- **Blue water footprint** is water that has been sourced from surface or groundwater resources and is either evaporated, incorporated into a product or taken from one body of water and returned to another, or returned at a different time. Irrigated agriculture, industry and domestic water use can each have a blue water footprint.

- **Grey water footprint** is the amount of fresh water required to assimilate pollutants to meet specific water quality standards. The grey water footprint considers point-source pollution discharged to a freshwater resource directly through a pipe or indirectly through runoff or leaching from the soil, impervious surfaces, or other diffuse sources

Available at https://waterfootprint.org/en/water-footprint/what-is-water-footprint/

The teacher shares this document

https://waterfootprint.org/media/downloads/Products.pdf

Annex 7:

EVAPORATION EXPERIMENT

MATERIALS:

*2 clear plastic cups
*Felt marker
*Clear plastic wrap
*Water

OBJECTIVE

To learn how water evaporates and dsiappears

METHODOLOGY:

Partly fill the plastic cups with water so that they both have the same level of water. Mark the levels with the marker. Seal one of the cups with plastic wrap. Leave it for a day. Look at both cups and mark where the water levels are. Do this for a few more days, marking the levels each day and noting any change. Students will notice that the water level goes down in the cup that has no cover. Where does the water go? Talk about the water disappearing and explain what evaporation is

FINAL RESULTS:

The water in the cups seems to disappear the longer you leave it in the sun. This is not a magic trick. It's science! As the sun heated up the water in the cup, some of the water evaporated into a gas called water vapor. You can't see water vapor, but you can tell that the water has changed from a liquid to a gas because there is less liquid in the cup.

Annex 8:

Product water footprint

Every product has a water footprint and that water footprint lands in one or more places in the world. The size of the water footprint lets us know how much of our limited water resources that product has claimed and whether it could be made more efficiently.

Students check the footprints of products at:

https://waterfootprint.org/media/downloads/Poster-A3-WaterFootprint-of-Products.pdf

Then they create their own game on 'How much water costs our meal?'

Everyone uses water to drink, cook and wash. However much more water is needed to produce ordinary things like food, paper and cotton. The water footprint is a tool to measure the water usage of a product, considered over its whole production chain. Game participants become aware of their water footprint by means of an interactive game. In this game we buy a meal in the supermarket. We will not have a look at the price but at the costs in amount of water: how much water is needed to produce the chosen meal? The person who has bought the meal with the lowest water footprint is the winner. And let's hope it still tastes good too! The children will be divided into groups of four. Every group will be assigned to buy a meal including a dessert for tonight. They have to choose a meal and a dessert from the recipes booklet. This booklet indicates which ingredients are needed for each meal. Of course the children want to choose something delicious but the assignment is to watch for the total water footprint of the meal. In the 'store' all products are provided. The price in water is indicated at every product (the water footprint in liters, which is the total amount of water used to produce the product, considered over its whole production chain). When a group has bought its products (collected in their basket), they could check out at the cashier (represented by you as an instructor). You sum up the total of water footprints of the separated ingredients and tell the group their total. The group of children with the lowest water footprint wins

Annex 9


USE WATER RIGHT!
Emrehan, Malatya SAC
According to the report because of the amount of food wasted 26 million tonnes per year in Turkey but also in 26.6 billion cubic meters of water is being wasted. It was stated that this amount is more than the active storage volume of Keban Dam.
DO NOT FORGET!
WATER IS NOT UNLIMITED!

References:

Europaen Commission, access: 17.06.2022: https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en

British Council, access 12.12.2021: https://learnenglish.britishcouncil.org/general-english/video-zone/greta-thunberg-and-george-monbiot-on-the-climate-crisis

Barbara S., Joan G., 2022, What are Nature-based solutions (NBS)? Setting core ideas for concept clarification, Nature-Based Solutions, access: 02.01.2022 https://doi.org/10.1016/j.nbsj.2022.100009

PART 1. OF SCENARIO

TITLE	The New Wonder: Graphene
MAIN SUBJECT	Science / Chemistry
OTHER SUBJECTS/DISCIPLINES	Physics, Informatics (ICT), English language
TYPE	*Larger educational project*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	15-16 years aged students

PART 2. OF SCENARIO

<table>
<tr><td>AIM OF CLASSES</td><td colspan="2">

- To introduce basic concepts regarding graphene to students in the 1st year of secondary school
- To raise awareness about graphene's importance in daily life and the world of materials
- To motivate students and generate a positive classroom climate.
- To promote interest in scientific and technological disciplines to students.
- To maintain a balance between competition and cooperation among students.
- To discover and understand scientific facts and principles, but also, and in large part, to stimulate positive behavior, adopt new ways of thinking, satisfy curiosities, promote conflict resolution, enhance skills, practice critical thinking, and increase self-confidence, among others (Hadim & Esche, 2002).

Hadim, H.A., & Esche, S.K. (2002). Enhancing the engineering curriculum through project-based learning. In Frontiers in Education Conference, 1-6. Boston. https://doi.org/10.1109/FIE.2002.1158200
</td></tr>
<tr><td rowspan="2">LEARNING OUTCOMES</td><td>IN THE FIELD OF KNOWLEDGE</td><td>

Students can:

- *Understand graphene in an easy and non-formal way*
- *Describe and give examples for everyday usage of graphene*
- *Learn by doing.*
</td></tr>
<tr><td>IN THE FIELD OF SKILLS</td><td>

Students can:

- Create their own games
- Write reports after doing an internet search or using learnt items.
</td></tr>
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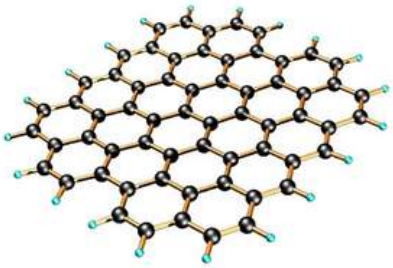
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: • Have good relationships with teammates, compete in certain activities, and the fact of facing all the challenges as a group they feel self confident. Help each other within the teams to understand complex concepts. • Feel more relaxed in a distractive and unconventional learning atmosphere. • Share works and learn to produce something together.
TEACHING METHODS	• **Gamification**: Creation of cram game. • **Do it yourself (DIY)**: Students do experiments to learn themselves and by doing.	
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	**Platforms and tools**: https://www.cram.com/ , https://answergarden.com, www.tinkercad.com **Materials**: Flexi bamboo sticks, 1 graphite art pencil, paper, tape, mini LED light bulb, 9V battery, thin piece of graphite, thin piece of cardboard, thin piece of plastic, ice (3 cubes), stopwatch	
PRELIMINARY CONDITIONS (if applicable)	*Students must have recorders for podcast interviews.*	
TIPS / METHODOLOGICAL REMARKS	Teacher should behave as a facilitator. He has to enhance motivation, transmit empathy, explain clearly, solve doubts, and connect with the students.	

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Chemistry** • explain the structure of graphite • relate the properties of graphite to its structure • explain the use of graphite in their daily lives **Physics** • do a simple circuit with graphite • explain why graphite conducts electricity and heat **Informatics (ICT)** • use appropriate software for creating 3D model of molecules, design and print 3D models **English language** • interview with a chemist and make a podcast in English

BASIC TERMS	Graphite, properties of graphene, use of graphene in daily life	
STRUC-TURE	LESSON 1	STEP 1 Brainstorming and discussion (15') Teacher asks students: *Have you ever heard about „graphite"?* *What do you know about it?* *In which sectors can it be used?* *Do you know how a pencil leaves a trace on a paper?* *Let's watch this video and learn!* https://youtu.be/IrZMSyhzcXg (Time: 04.06') A Sketchy History Of Pencil Lead STEP 2: Why is graphite different from graphene? (20') Then teacher explains the difference between graphite and graphene: Graphite and graphene are a very important carbon-containing material that is related to each other. The difference between graphite and graphene is that graphite is an allotrope of carbon having a high number of carbon sheets whereas the graphene is a single carbon sheet of graphite. Students work in groups and use flexi bambu sticks to form graphenes.  Idealized structure of a single graphene sheet. Adapted from: https://cnx.org/contents/8G1mxcKk@2/Characterization-of-Graphene-by-Raman-Spectroscopy STEP 3 : Brainstorming on graphene and its daily usage (10') Graphene is a single layer of carbon atoms, tightly bound in a hexagonal honeycomb lattice. Graphene is the thinnest compound known to man at one atom thick, the lightest material known (with 1 square meter weighing around 0.77 milligrams), the strongest compound discovered (between 100-300 times stronger than steel with a tensile strength of 130 GPa and a Young's modulus of 1 TPa - 150,000,000 psi), the best conductor of heat at room temperature and also the best conductor of electricity known (studies have shown electron mobility at values of more than 200,000 cm2·V−1·s−1). Access date: 16.03.2022 https://www.graphenea.com/pages/graphene#.YxJV0HZBxP4

		How do we use graphene in our everyday life? Students answer this question on https://answergarden.com
	LESSON 2	**STEP 1 What is graphene? (20')** Lesson starts with a video named ,What is graphene?" as a reminder of previous lesson. https://youtu.be/1aEp8R8SqnQ (2,47') Then another video ,The Miracle Material: Graphene is watched to learn about usage of graphene and compare the new learnt items with the ones students give in answergarden. https://youtu.be/fs1-9xRsGCQ (Time: 5.58') Students work in groups and use sway to make a short report of whatever they have learnt so far. They can find information on the internet. Below you will see a sample. https://sway.office.com/a69eU1bgUpQzsdGv **STEP 2 Physics:(25')** **Experiment 1: The conductive properties of graphite (Annex 1)** Can you complete an LED circuit using a graphite pencil? Learn about the conductive properties of graphite and draw your own design to see it light up! This is a super quick and easy science experiment. Let's do it yourself! **Experiment 2: Thermal conductivity of graphite (Annex 2)** Graphite sheets have a thermal conductivity constant around 10,000 to 5,000 times higher than cardboard and plastic. Therefore, Graphene will transfer significantly more heat over time from a source of heat (your hand) to the ice as compared to cardboard and plastic. Cardboard and plastic do not have such a high thermal conductivity constant and will require more time to transfer the heat from your hand to the ice. **Both of the experiment sheets are available at the link below:** https://www.canva.com/design/DAFLJre-CPY/4OHMLNUzsmBby4pQbyFW2g/edit?utm_content=DAFLJre-CPY&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton
	LESSON 3	**Step 1 Tinkercad - 3D design Graphene (40')** Teacher introduces tinkercad programme to create 3d graphenes. https://www.youtube.com/watch?v=g0s6Mdj7y_4

		The video „TinkerCAD - Tutorial for Beginners in 9 MINUTES!" is watched. While creating 3D of the graphene molecule and graphene layer they will explore ways of storing results in appropriate file format suitable for 3D modeling programs. Also, they will be introduced with the idea of using modeling and simulation while acquiring new knowledge and how it could be beneficial. **(Annex 3)** **Step 2 Printing (5')** Then they send their 3d designs to the 3D printer.
	LESSON 4	**Step 1 Properties of Graphene (20')** Graphene, called the miracle material, has taken its place among the global rush industry. It resists high bending forces without breaking. It is one of the most conductive materials for electricity and heat, which makes it the perfect material for electronics and many other industries. For many experts, **graphene is the material of the future**. Its scientific definition can be considered somewhat complex, but the truth is that the properties of this material open a new horizon in the world of technology. Students surf on these websites https://en.wikipedia.org/wiki/Graphite https://nanografi.com/blog/60-uses-of-graphene/ to learn more about properties of graphene. **Step 2 Cram Game(15')** After internet search, students will be grouped and they will study the use of graphene by information found in Internet, work on www.cram.com To create their own pictionary game. Here is a sample Annex 4: http://www.cram.com/flashcards/uses-of-graphene-in-our-daily-lives-12958139 Each group may play each other's game like a brain box game. Select one picture and try to guess in which industry or sector graphene is used. **Step 3 It is your turn!!** **Interview with a chemist and make a short podcast.** Interview with a chemist to learn more about graphene, its structure, usage sector. They will make a podcast and share it with their friends to discuss their findings.

PART 4. OF SCENARIO

BENEFITS	Students learn the structure of graphite, physical properties of graphite. They have a chance to apply different digital tools and do activities on their own.
RISKS AND SUGGESTED SOLUTIONS	Traditional classroom structures and teachers in the center of teaching may not serve to the aims of the scenario. Teachers must be facilitators helping and guiding students but not giving all details. Flexibility of space is quite important; reorganizing the tables,to getting access to internet for dynamic activities

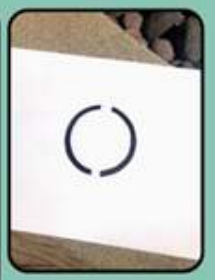
Graphite circuit experiment

Supplies

- 1 Graphite Art Pencil
- Paper
- Tape
- Mini LED Light Bulb
- 9V Battery

Did you know you can make a circuit of electricity using a graphite drawing pencil?

Plan your graphite circuit design on a piece of paper. You can draw a shape to start, adding the graphite later. Be sure to create a shape outline with two openings at each end. This is going to be crucial in making our graphite circuit!



Create a thick line of graphite over your shape. Add positive and negative symbols to the two open areas as guides. We colored the inside of the circle like the earth but you can draw other things too!

Tape the wires of your LED bulb to the graphite opening aligning the long wire with the positive side of the opening and the shorter wire with the negative side of the opening. Tape the bulb in an upright position. This is where those + and – symbols we drew earlier come in handy!

Place your 9v battery on the opposite end over the positive and negative sides of the graphite. The light bulb should light up! Ta-da! We have completed our graphite circuit and created an electrical current. Pretty dang awesome huh?

RESULTS AND CONCLUSION

The graphite acts as a path for the electrical energy. When the battery is placed on the graphite, energy flows from the battery, along the graphite path, through the wires on the light bulb, continuing back to the battery completing the circuit. If the battery is removed, the circuit is broken.

Ice cutter experiment

Supplies

- Thin piece of Graphite
- Thin Piece of cardboard
- Thin piece of plastic
- Ice (3 cubes)
- Stopwatch

Note!

Graphene is an individual layer of a honeycomb lattice of carbon atoms which makes up graphite and is used for a variety of purposes including electronics, semiconductors and batteries. Its presence is known in these industries due to it having a thermal conductivity constant (k), which is a measure of how fast heat is transferred, of near 1000 W/m*K. Other materials such as cardboard and plastic do not find themselves in these industries due to there lower thermal conductivity constant of around 0.1 W/m*K and 0.2 W/m*K

Hypothesis

Graphite will transfer significantly more heat over time from your hand to the ice and thus cut through ice significantly faster when compared to cardboard or plastic.

Procedure

1. Place an ice cube on a flat surface
2. Hold a piece of graphite with your bare hand and gently place the thinnest portion of graphite sheet on the ice without any pressure
3. Record the time required for the graphene to pass through the Ice cube
4. Repeat step 2 and 3 for both Cardboard and Plastic

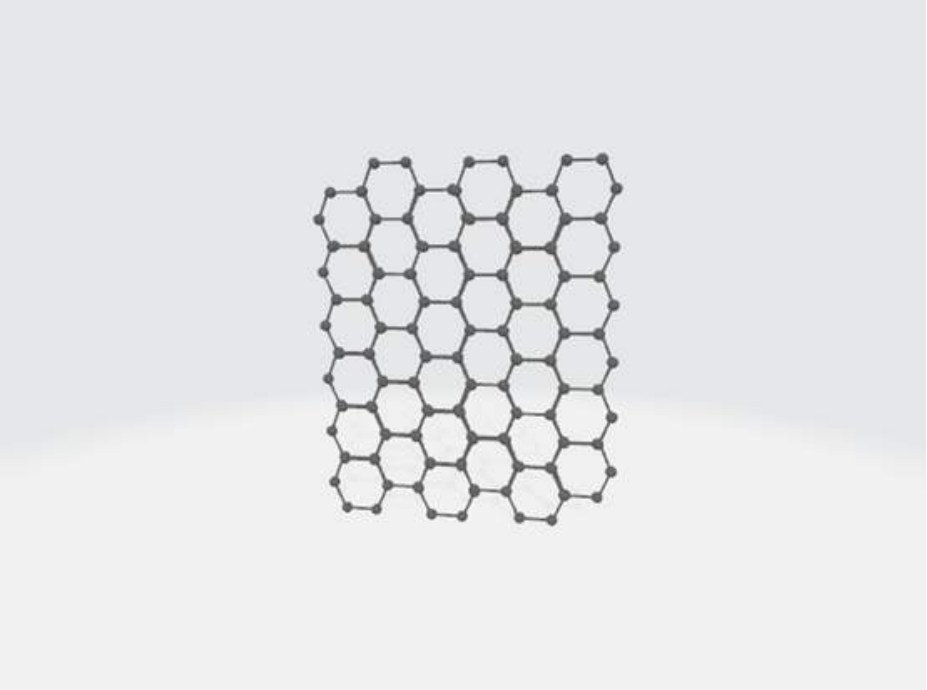
Observation

Graphite sheet should cut through the ice almost instantaneously whereas the cardboard and plastic do not cut through the ice as readily. Image

RESULTS AND CONCLUSION

Graphite sheet has a thermal conductivity constant around 10,000 to 5,000 times higher than cardboard and plastic. Therefore, Graphene will transfer significantly more heat over time from a source of heat (your hand) to the ice as compared to cardboard and plastic. Cardboard and plastic do not have such a high thermal conductivity constant and will require more time to transfer the heat from your hand to the ice.

ANNEX 3: 3D DESIGNED GRAPHENE



ANNEX 4: SAMPLE CRAM GAME ON EVERDAY USAGE OF GRAPENE

cram Uses of Graphene in Our Daily Lives
Study this set online at: https://www.cram.com/flashcards/uses-of-graphene-in-our-daily-lives-12958139

	**Graphene in Speakers and Headphones:** A speaker converts electricity into sound by vibrating a membrane in the air. Graphene is used to make lightweight and great rigidity membranes.
	**Graphene in Automotive:** The extraordinary strength and hardness of graphene, coupled with its flexibility, is perfect to start creating cars that are immune to shocks. Moreover, accident-proof vehicles could also be created. To learn more click here -->>> https://www.youcube.com/watch?v=jRGFcTs07fs
	**Graphene in Shoes:** Graphene sneakers? Yes, although in this case it is not used purely, other composite materials take advantage of it. Infact, it is claimed that a sole made of pure graphene could last hundreds of years.
	**Graphene in Food Packaging:** Graphene can also be used as a coating material because it prevents the transfer of water and oxygen. Graphene membranes can be used in food or pharmaceutical packaging by keeping food and medicines fresh for longer time.
	**Graphene in Airplanes:** Scientists from UK have designed an airplane that includes graphene in the carbon-fiber coating of the aircraft's wings. The model plane, Prospero, was lighter since it was enough to cover the wings with only one layer of the improved composite. It consumes less fuel, resists impact better, and has lower environmental costs as well.
	**Graphene Paints:** Every painter knows it very well: humidity is the number one enemy of painting. Grapheneone is a company that makes graphene painting solutions. The result? The light bounces better, protects barrels and basements.
	**Graphene in Machinery Lubricants :** Industrial machines mostly suffer from friction because friction affects the durability. Graphene offers perfect friction. It is having a great chemical inertness, smooth and densely packed surface makes graphene a great lubricant material.

SCENARIO COOKING WITH THE SUN

PART 1. OF SCENARIO

TITLE	**SCENARIO COOKING WITH THE SUN**
MAIN SUBJECT	**Physics**
OTHER SUBJECTS/DISCIPLINES	**Technological Education, Visual Arts, Natural Sciences, Mathematics**
TYPE	*Larger educational project*
DURATION OF CLASSES	8 lessons x 90 minutes
AGE OF STUDENTS	**15-16 years aged students**

PART 2. OF SCENARIO

AIM OF CLASSES		By designing and building a solar oven, we intend to raise the students' awareness to the issue of climate change and to the importance of the rational use of natural energy resources for the social, economic and environmental sustainability of our communities. By means of a multidisciplinary project-based methodology, students are expected to constructively learn scientific contents of different subjects and understand how different areas of knowledge can come together to solve specific problems and challenges. Students are expected to improve their ability to deal with change and uncertainty cooperatively and responsibly in a rapidly changing world, and to recognize the importance of taking mitigating local actions.
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	To develop multiple literacies that allow students to critically analyze and question reality, assess and select information, formulate hypotheses and make informed decisions in their daily life.
	IN THE FIELD OF SKILLS	To develop collaborative work and communication skills. To develop critical thinking, creativity and divergent thinking. To improve problem-solving skills.
	IN THE FIELD OF SOCIAL COMPETENCES	To promote teamwork. To raise environmental and social awareness and responsibility, working collaboratively for the common good and to build a sustainable future.

TEACHING METHODS	Problem, project and challenge-based learning Learn-by-doing Design thinking methodology Brainstorming, discussion of ideas, teamwork, Buzz groups and other interactive/participative methods
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Computer Internet Multimedia Projector Arduino science Kit Physics lab Arduino app Drawing material (pencil, eraser, sheets of paper, ruler, square) Reusable materials for oven construction (cardboard, aluminum foil, plastic, glass, wooden board, …) Food to cook (eggs, vegetables - broccoli, sweet potato, …) Online tools: Quizizz
PRELIMINARY CONDITIONS (if applicable)	Basic knowledge of the use of Arduino Kits with thermal sensors to measure temperatures (for a tutorial on using thermal sensors with Arduino see link: https://create.arduino.cc/projecthub/akarsh98/ds18b20-temperature-sensor-tutorial-with-arduino-and-esp8266-db31aa) accessed in 20/05/2022
TIPS / METHODOLOGICAL REMARKS	This learning scenario was prepared for educational systems organised into classes of different separate subjects. It is, however, easily adaptable to other systems, which allow for different subjects / teachers to work with the same class simultaneously. The process for group formation may be random, according to the students' preferences or depending on the teacher's knowledge of his/her class dynamics.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Physics** Identifying processes of energy transfer (conduction, convection and radiation) used daily, justifying choices that promote the rational use of energy. Differentiating renewable from non-renewable energy sources and analyzing the advantages and disadvantages of their use, including their implications to sustainability, from an interdisciplinary perspective. Creating and interpreting charts and graphics.

Mathematics

Recognizing a function in several representations, and interpreting it as a relationship between variables and as a unique correspondence between two sets.

Using functions to represent and analyze situations, in mathematical and non-mathematical contexts.

Systematizing and representing data using different representations and interpreting the represented information.

Analyzing and interpreting information contained in a data set, using the most appropriate statistical measures (median, mean, mode) and recognizing their meaning in the context of a given situation.

Making and analyzing graphs.

Technological Education

Differentiating the stages of project implementation: identification, research, execution and evaluation.

Identifying technical specifications, constraints and resources in order to carry out a project.

Selecting materials according to their physical and mechanical properties.

Creating technological solutions with reused or recycled materials, keeping in mind environmental sustainability.

Natural Sciences

Differentiating energy resources from non-energy resources and renewable resources from non-renewable resources.

Discussing the impacts of the exploration/transformation of natural resources and proposing measures to reduce it and to promote sustainability.

Understanding the problem of climate change.

Critically analyzing the environmental, social and ethical impacts of scientific and technological breakthroughs on sustainable development and on improving the quality of life of human populations.

	Visual Arts Autonomously selecting ideas and work processes, which involves research, investigation and experimentation. Organizing individual or group exhibitions in different formats – physical and/or digital - selecting themes based on analysis and comparison, combining the notions of composition and harmony. Creating a video for the dissemination of the project and its results.	
BASIC TERMS	Sustainable development, climate change, natural energy resources, renewable and non-renewable energy sources, solar energy, solar oven.	
STRUC-TURE	Natural Sciences 1	STEP 1 – Students are shown a video and/or news articles to raise awareness to the issue of climate change (suggested one-minute video: The Global Climate Change, https://youtu.be/WmVOIkNGHjE, accessed 20/05/2022) STEP 2 - Students explore the webpage https://www.iea.org/regions/europe (accessed20/05/2022) to understand how different countries explore different sources of energy and how that improves CO2 emissions. Students are asked: 1. How can we be part of the solution for climate change? - We expect them to remember about reducing fossil fuels; improving renewables sources; reducing consumption; increasing plant-based diets; reforestation; Carbon capture and storage technologies, among others. 2. Can we cook without any pollution involved? -Students may remember about cooking with geothermal energy and solar energy. STEP 2 – Students are asked about the meaning of several key concepts, to be clarified by the teacher, if needed (*energy resources / non-energy resources / renewable resources / non-renewable resources / kinds of renewable resources / advantages and disadvantages*) After a large group discussion these concepts are registered in a table (attachment 1). STEP 3 – Students solve a quiz at Quizizz.com about the topics introduced in step 2 (to edit and use this Quizizz see link: https://quizizz.com/admin/quiz/6219109f601eb0001eb32888

		STEP 4 – For homework, students are asked to collect different materials and bring them to the next Physics class. These materials are to be tested, to choose the most appropriate for solar oven construction.
	Physics 2	STEP 1 – Students are asked: *What do we need to know to build a solar oven?* STEP 2 - Based on the answers, teacher elicits concepts regarding the processes of energy transfer: conduction, convection and radiation. STEP 3 – Students are divided into groups to develop their projects STEP 4 - Each group undertakes a practical activity to test the different materials and their heat conductivity and/or heat reflection properties (attachment 2) STEP 5 – Students discuss the results and select the materials to build the solar oven STEP 6 - Students are assigned homework for the next Physics class, consisting on an internet search on possible oven models and on bringing the materials chosen to build the oven.
	Visual Arts 3	STEP 1 - Students are asked to draw individual sketches of a solar oven, based on the ideas resulting from the research carried out after the Physics class. STEP 2 – in the groups formed in the Physics class, students analyse and select the best sketch.
	Visual Arts 4	STEP 1 – Using the sketch selected in the previous class, students draw the two-dimensional version of the final project (rigorous drawing in a A3 sheet at a 1/3 scale), to be carried out three-dimensionally in the Technological Education class.
	Techno-logical Educa-tion 5	STEP 1 – Guided by the final project, students organize the different tasks within the groups; STEP 2 – Construction of the solar oven; (for an example of a possible oven design see link: https://www.greenoptimistic.com/solar-oven-cardboard/) accessed in 20/05/2022

	Maths 6	STEP 1 – Using an ARDUINO Kit groups test the efficiency of their oven in an outdoor area, by measuring thetemperature reached inside and outside the oven over time (attachment 3). For a tutorial on using thermal sensors with Arduino see link: https://create.arduino.cc/projecthub/akarsh98/ds18b20-temperature-sensor-tutorial-with-arduino-and-esp8266-db31aa) accessed 20/05/2022), STEP 2 – Students make and use charts and graphics in order to analyse data and choose the most efficient oven design
	Extra class 7 All Subjets	STEP 1 – On a suitable outdoor area, students cook different types of food using the most efficient solar oven.

PART 3. OF SCENARIO

RISKS AND SUGGESTED SOLUTIONS	Risk: There aren't any Arduino kits and thermal sensors to measure temperature - Solution: use thermometers to measure temperatures Risk: Students don't bring the required materials to test and build the ovens - Solution: Teacher should have various materials as backup for the required activities. Risk: Solar radiation isn't sufficient to test the ovens - Solution: Always check weather forecast prior to the activity.

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PART 1. OF SCENARIO

TITLE	**SCENARIO SPATIAL THINKING DEVELOPMENT STUDIES**
MAIN SUBJECT	**3-Dimensional Thinking / Maths**
OTHER SUBJECTS/DISCIPLINES	**Space, Science, ICT and Art**
TYPE	*Larger educational project*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	**15-18**

PART 2. OF SCENARIO

AIM OF CLASSES	• Learning all distinct nets of the Cube. (There are the eleven distinct nets of a cube) • Detecting Opposite Surfaces in the closed state of the Cube that is given by nets. • The net of the cube which is given is closed and has various patterns (letters, numbers, shapes, ... etc.) being able to find among the given options. • The closure of the cube which is given by the net and has various patterns (letters, numbers, shapes, ... etc.) being able to be found among the given options. • The closed solid is different from the cube which is given a net and has various patterns (letters, numbers, shapes, ... etc.) being able to find among the given options. • Being able to find how many unit cubes the objects consisting of unit cubes consist of, based on the image given from the front. • To be able to draw the planar image of the objects consisting of unit cubes from the desired direction (right, left, top or bottom) based on the image given from the front. • To be able to draw the expansion of the Square Paper, which is given step by step folding positions and formed by punching a part of the paper after the final folding step. • To be able to draw objects made of unit cubes, which are given a planar image from two or more directions. • To be able to draw objects made of unit cubes, rotated from many directions. • Being able to find the rotated form of objects consisting of unit cubes among the given options.

	• Prisms whose outer surface is completely painted in a single color and consist of unit cubes; Being able to determine the number of unpainted unit cubes and the number of painted ones with one face, two faces, three faces among the unit cubes formed when they are broken into unit cubes. • Objects that are not prisms, whose outer surface is completely painted in a single color and consist of unit cubes; Being able to determine the number of unit cubes with one face, two faces, three faces, four faces, five faces, and the number of unpainted unit cubes formed when they are broken into unit cubes. • Moving to the implementation phase. To be able to solve questions in the dimensions of analysis and synthesis, mostly at the abstract level, which appeared in international mathematics competitions.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: · Draw an object visually, · Visualize two- and three-dimensional parts of objects, · Draw spatial, that is, 3-dimensional images of objects, · Rotate and interpret objects, · move objects mentally in three-dimensional space, · Put together or break apart objects in one's mind, or visualize objects from a different perspective
	IN THE FIELD OF SKILLS	Students can: · Think critically and solve problems (the ability to ask the right questions) · Access and analyze information · Communicate and write effectively · Improve their curiosity and so imagination · Learn to learn · Think creatively
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: · Effective communication · Work in teams · make decisions together · Learn how to manage their time · Respect personal space
TEACHING METHODS	Problem-based learning and Creative Problem Solving: In problem solving; application, analysis, synthesis and evaluation students who can focus on their steps; Thanks to these features, they provide great success in solving less structured and unstructured problems.	

TEACHING METHODS	Project-based learning: Students get fact-based tasks, problems to solve and they work in groups Lifelong learning: Students gain conscious about real-time and future problems. Collaborative learning: There will be a strong focus on group work.
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Worksheets, pen
PRELIMINARY CONDITIONS (if applicable)	*No conditions must be fulfilled*
TIPS / METHODOLOGICAL REMARKS	The importance of spatial ability, which we apply in many areas of our lives, in scientific fields, especially in mathematics, is indisputable. This is why; Spatial ability is one of the most important factors affecting students' success in mathematics and other fields. We can say that one of the primary goals of education is to develop students' creativity and abstract thinking skills. This is why; It is important for researchers to work on spatial ability, which is directly related to creativity and abstract thinking skills. Your spatial ability intertwined with creativity and abstract thinking skills; Its importance for students is indisputable. The spatial ability levels of these students are of great importance in determining the differentiated mathematics education program studies based on high-level thinking skills for students.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Space** Science ICT Art

BASIC TERMS	Unit cube, nets of cube, divide into unit cubes, mental rotation, paper folding and punching,	
STRUC-TURE	LESSON 1	**STEP 1 (10') The nets of cube** It starts by asking the students to find how many different expansions the cube has by working as a team. Can a common strategy be found from different expansions of the cube? The students do teamwork. The students are expected to find the following different cube expansions. It is discussed in the last step. (see Study 1) **STEP 2 (5') Patterned closed cube and open shape** Students are asked to find the nets of the cube, which is closed and has various patterns (letters, numbers, shapes, ... etc.) among the given options. It is discussed along with its reasons. (see Study 2) **STEP 3 (5') Patterned open cube and closed shape** Students are asked to find the closed cube which is given of net and has various patterns (letters, numbers, shapes, ... etc.) being able to find among the given options. It is discussed along with its reasons. (see Study 3) **STEP 4 (5') Patterned open solid and closed shape** Students are asked to find the closed solid different from the cube which is given as a net and has various patterns (letters, numbers, shapes, ... etc.) being able to find among the given options. It is discussed along with its reasons. (see Study 4) **STEP 5 (5') Number of Unit Cubes** Students are asked to find out how many unit cubes are in a solid made up of unit cubes. It is discussed along with its reasons. (see Study 5) **STEP 6 (5') 2-Dimensional Views of 3-Dimensional Solid** Students are asked to draw a 2-dimension view from the desired directions of a 3-dimensional solid which is constructed with several cubes. It is discussed along with its reasons. (see Study 6)
	LESSON 2	**STEP 1 (15') Paper Folding Test** In the Paper Folding Test, the task of the students; find out the position of the paper after opening which is folded and holed in various points. (see Study 7)

		STEP 2 (25') From Different Positions Rotation Views of 3-Dimensional Solids On The Mental Rotation Test each item consists of a row of five line drawings, including a geometrical target figure in the left most position followed by four response-choice figures: two rotated reproductions of the target and two distractors. The student's task is to indicate which two of the four response choice figures are rotated reproductions of the target figure. (see Study 8)
	LESSON 3	**STEP 1 (10') The Number of Painted Faces of The Unit Cubes Forming The Prisms** Prisms whose outer surface is completely painted in a single color and consist of unit cubes; Being able to determine the number of unpainted unit cubes and the number of painted ones with one face, two faces, three faces among the unit cubes formed when they are broken into unit cubes. (see Study 9) **STEP 2 (10') The Number of Painted Faces of The Unit Cubes Forming The Non-Prism Solids** Solids that are not prisms, whose outer surface is completely painted in a single color and consist of unit cubes; Being able to determine the number of unit cubes with one face, two faces, three faces, four faces, five faces, and the number of unpainted unit cubes formed when they are broken into unit cubes. (see Study 10) **STEP 3 (20')** Moving to the implementation phase. To be able to solve questions in the dimensions of analysis and synthesis, mostly at the abstract level, which appeared in international mathematics competitions. (see Study 11)

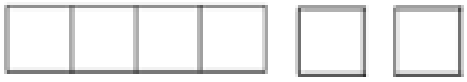
PART 4. OF SCENARIO

BENEFITS	As the spatial intelligence level of the student develops, their creative thinking skills develop in parallel.
RISKS AND SUGGESTED SOLUTIONS	- Students who have difficulties in abstract thinking may have difficulties in spatial thinking studies. + For students who have difficulty thinking abstractly; studies can be done step by step by concretizing (by using paper, pencil and scissors) and by extending the studying time

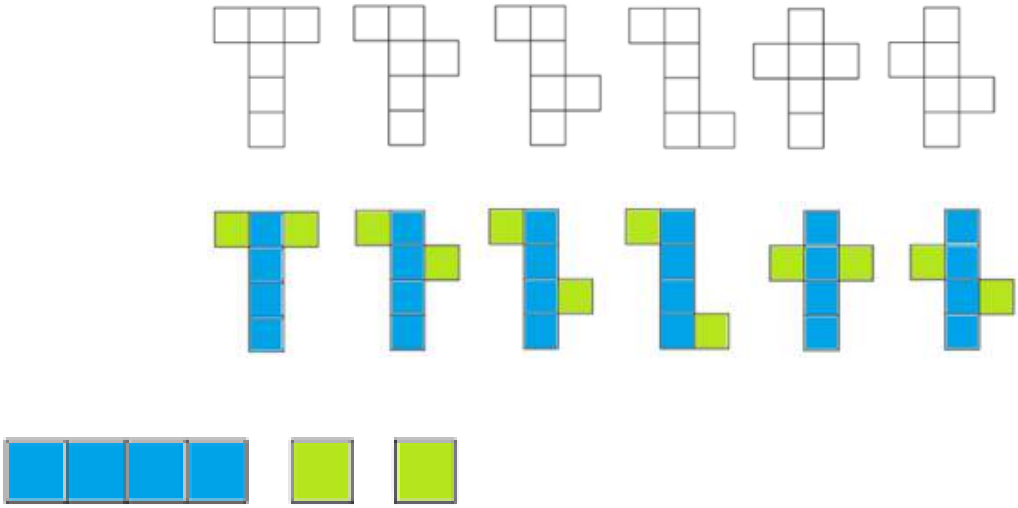
BORAN DR. ALİ İHSAN

STUDY 1: THE NETS OF CUBE

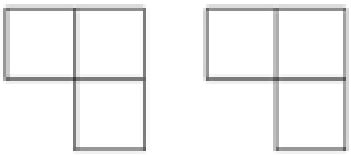
FIND DIFFERENT NETS OF CUBE BY USING THE FOLLOWING FIGURES (4 CUBES FORMING THE SIDE FACES AND 1 CUBES FORMING THE BASES)



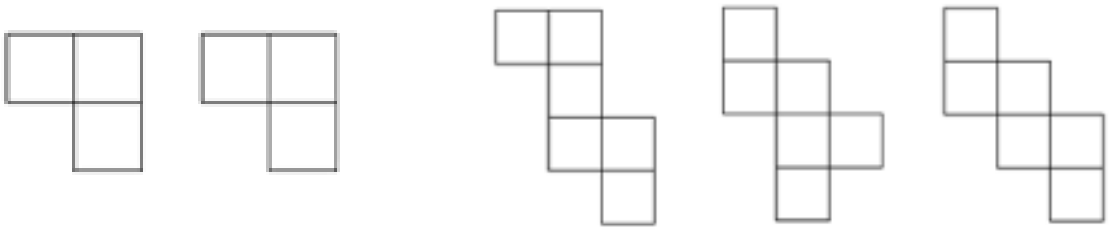
THE STUDENTS DO TEAMWORK. THE STUDENTS ARE EXPECTED TO FIND THE FOLLOWING DIFFERENT CUBE EXPANSIONS. IT IS DISCUSSED IN THE LAST STEP.



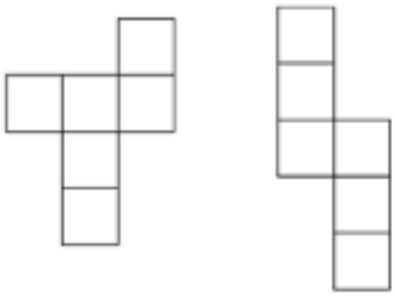
FIND DIFFERENT NETS OF CUBE BY USING THE FOLLOWING FIGURES (2 TRIPLE L-SHAPED CUBES)



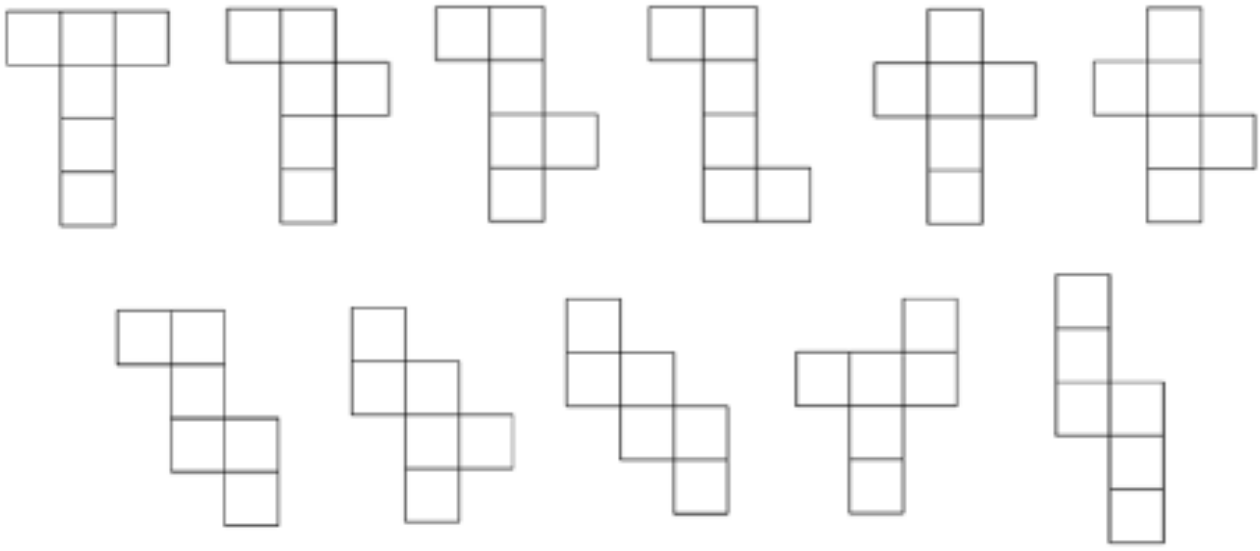
THE STUDENTS DO TEAMWORK. THE STUDENTS ARE EXPECTED TO FIND THE FOLLOWING DIFFERENT CUBE EXPANSIONS. IT IS DISCUSSED IN THE LAST STEP.



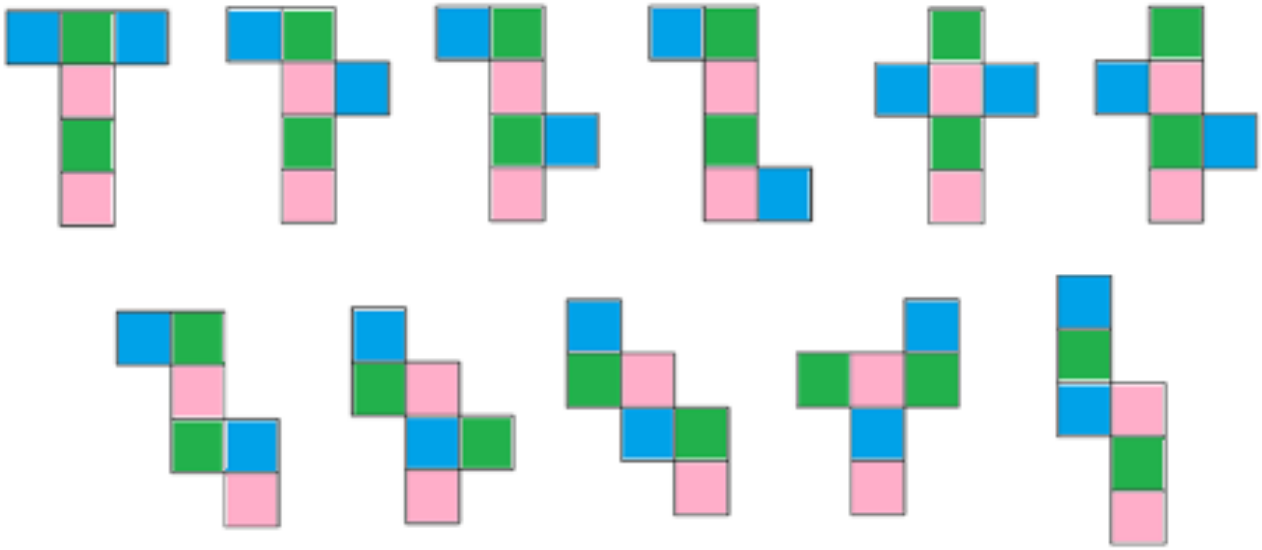
APART FROM THE OPEN SHAPES OF THE CUBE ABOVE, STUDENTS ARE ASKED TO COMMENT ON THE TWO DIFFERENT EXPANSIONS BELOW.



STUDENTS WHO LEARN ALL THE DIFFERENT NETS OF THE CUBE ARE ASKED TO FIND WHICH FACES IN THEIR OPEN SHAPES FACE EACH OTHER IN CLOSED FORM. THESE SURFACES ARE REQUIRED TO BE PAINTED IN THE SAME COLOR.

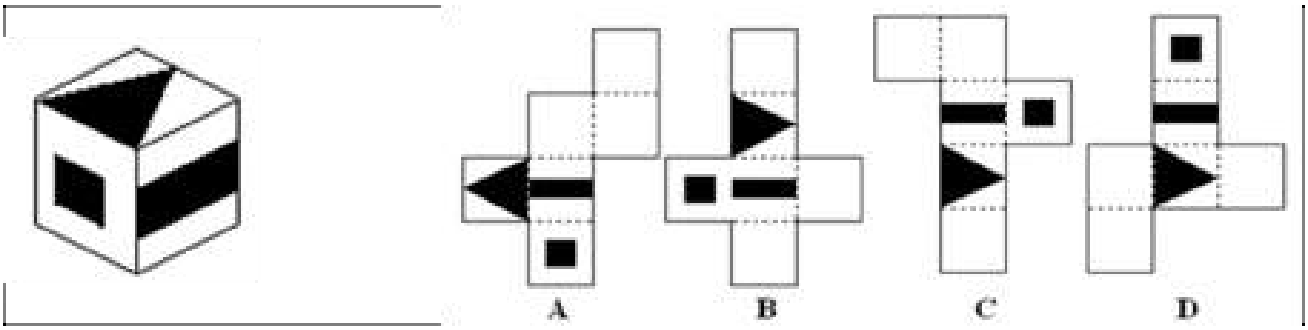


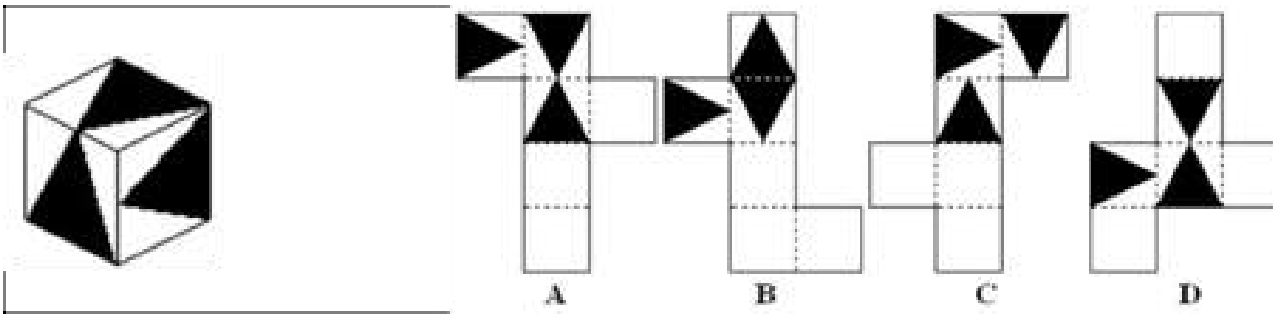
STUDENTS DO TEAMWORK. STUDENTS ARE EXPECTED TO REACH THE FOLLOWING CONCLUSION. IT IS DISCUSSED IN THE LAST STEP.

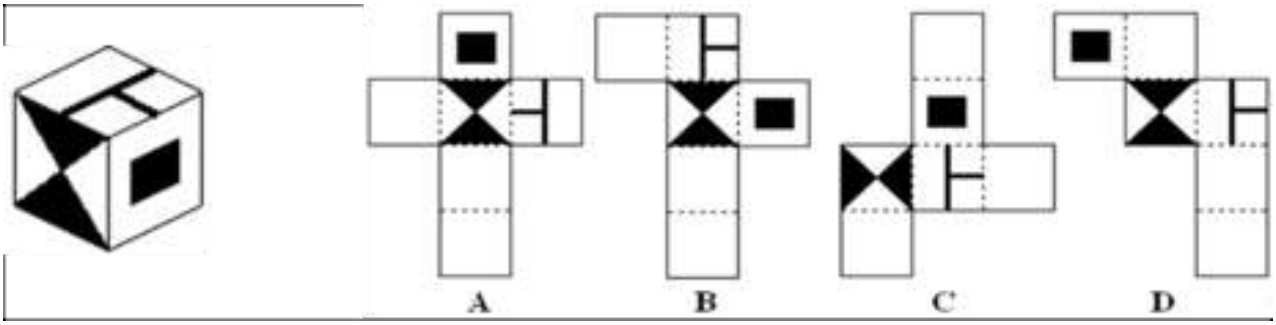


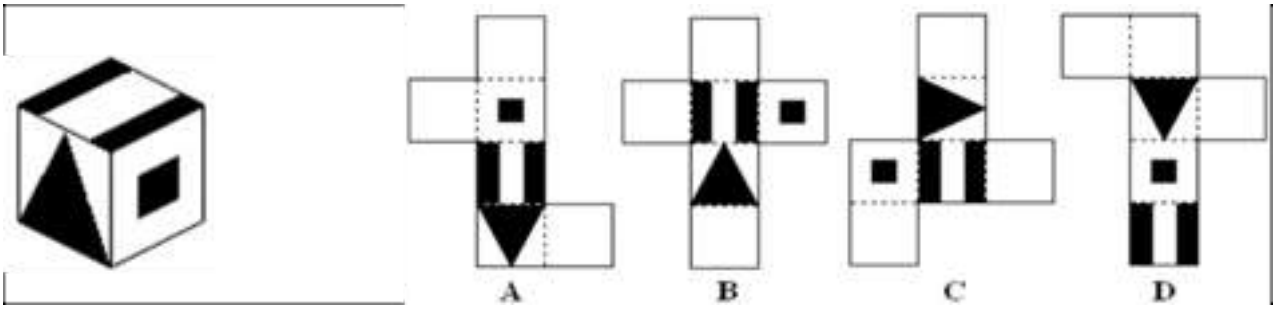
STUDY 2: PATTERNED CLOSED CUBE AND OPEN SHAPE

STUDENTS ARE ASKED TO FIND THE NETS OF THE CUBE, WHICH IS CLOSED AND HAS VARIOUS PATTERNS (LETTERS, NUMBERS, SHAPES, ... ETC.) AMONG THE GIVEN OPTIONS. IT IS DISCUSSED ALONG WITH ITS REASONS.



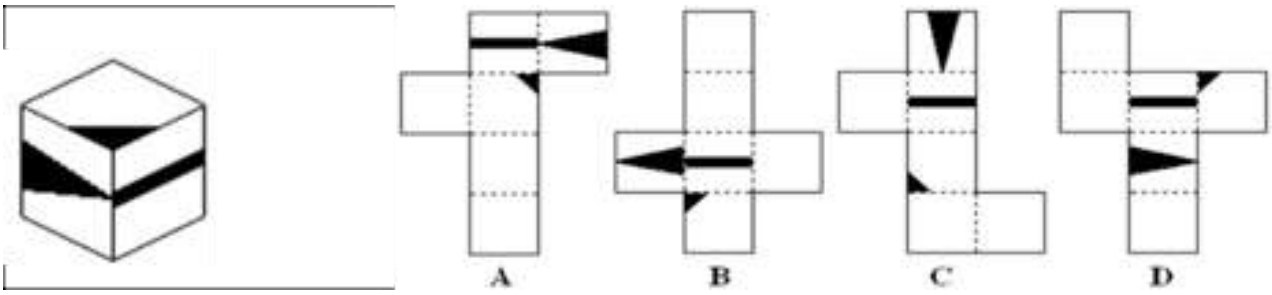


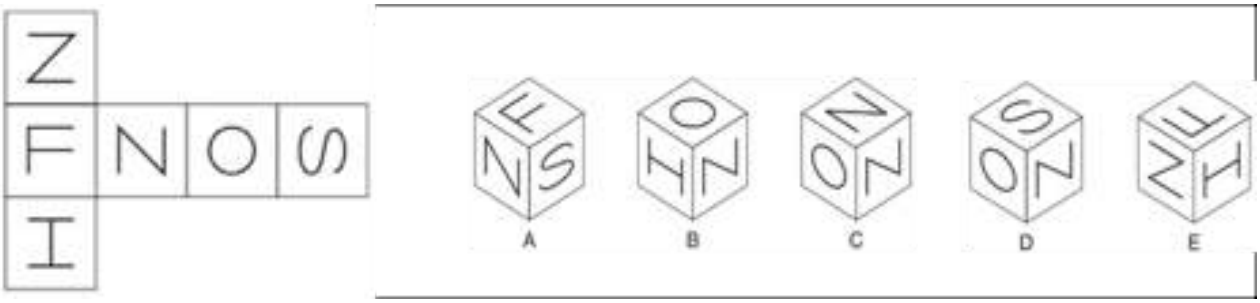




STUDY 3: PATTERNED OPEN CUBE AND CLOSED SHAPE

STUDENTS ARE ASKED TO FIND THE CLOSED CUBE WHICH IS GIVEN A NET AND HAS VARIOUS PATTERNS (LETTERS, NUMBERS, SHAPES, ... ETC.) BEING ABLE TO FIND AMONG THE GIVEN OPTIONS. IT IS DISCUSSED ALONG WITH ITS REASONS.

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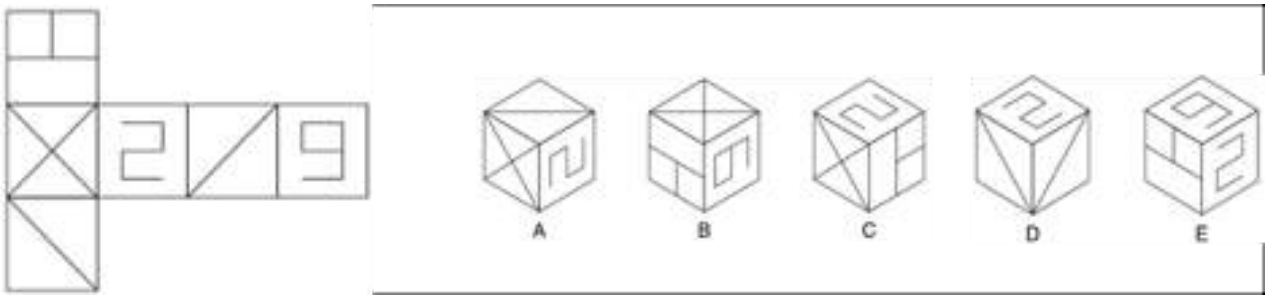
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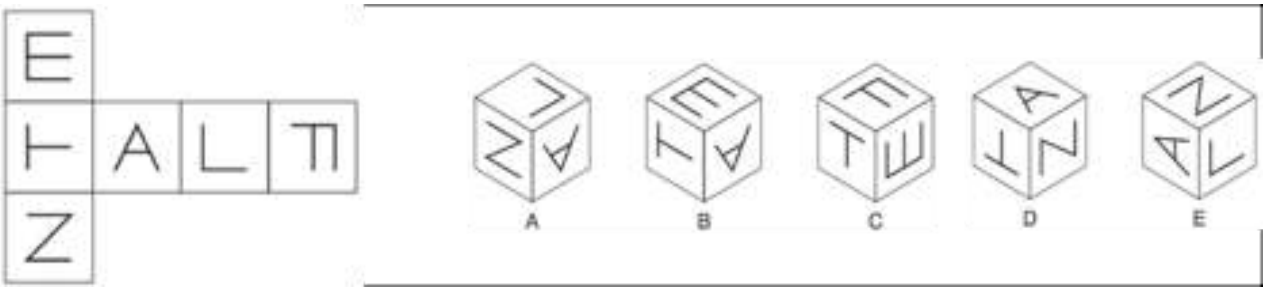
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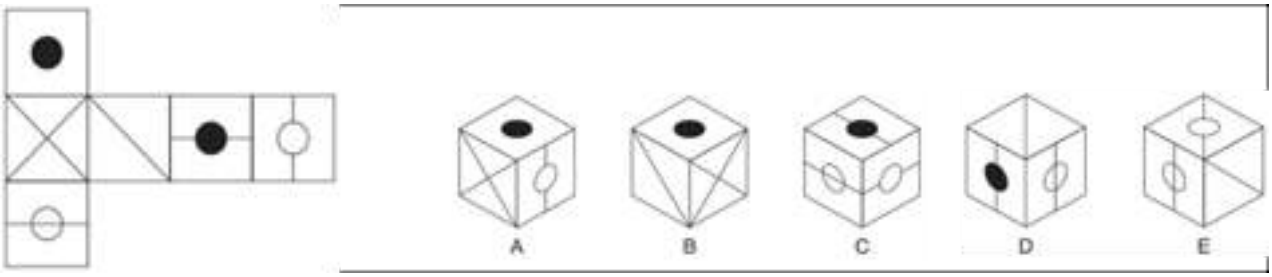
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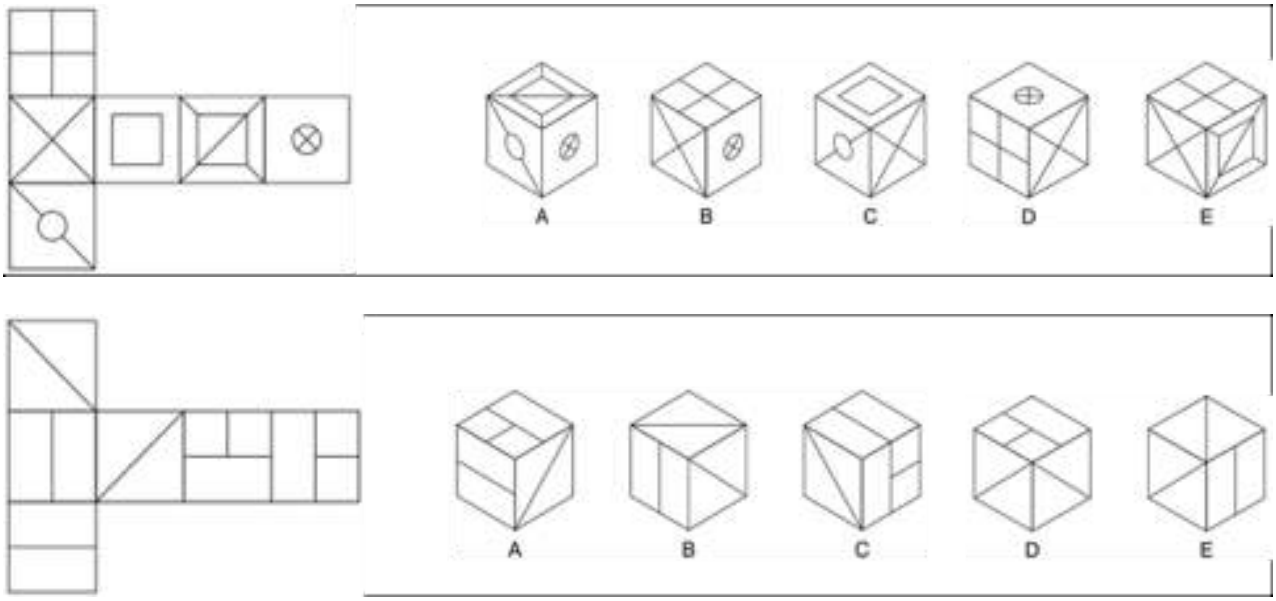
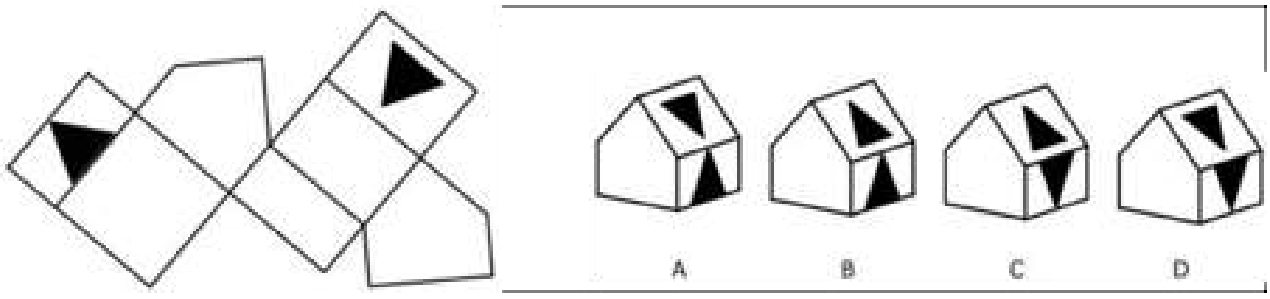
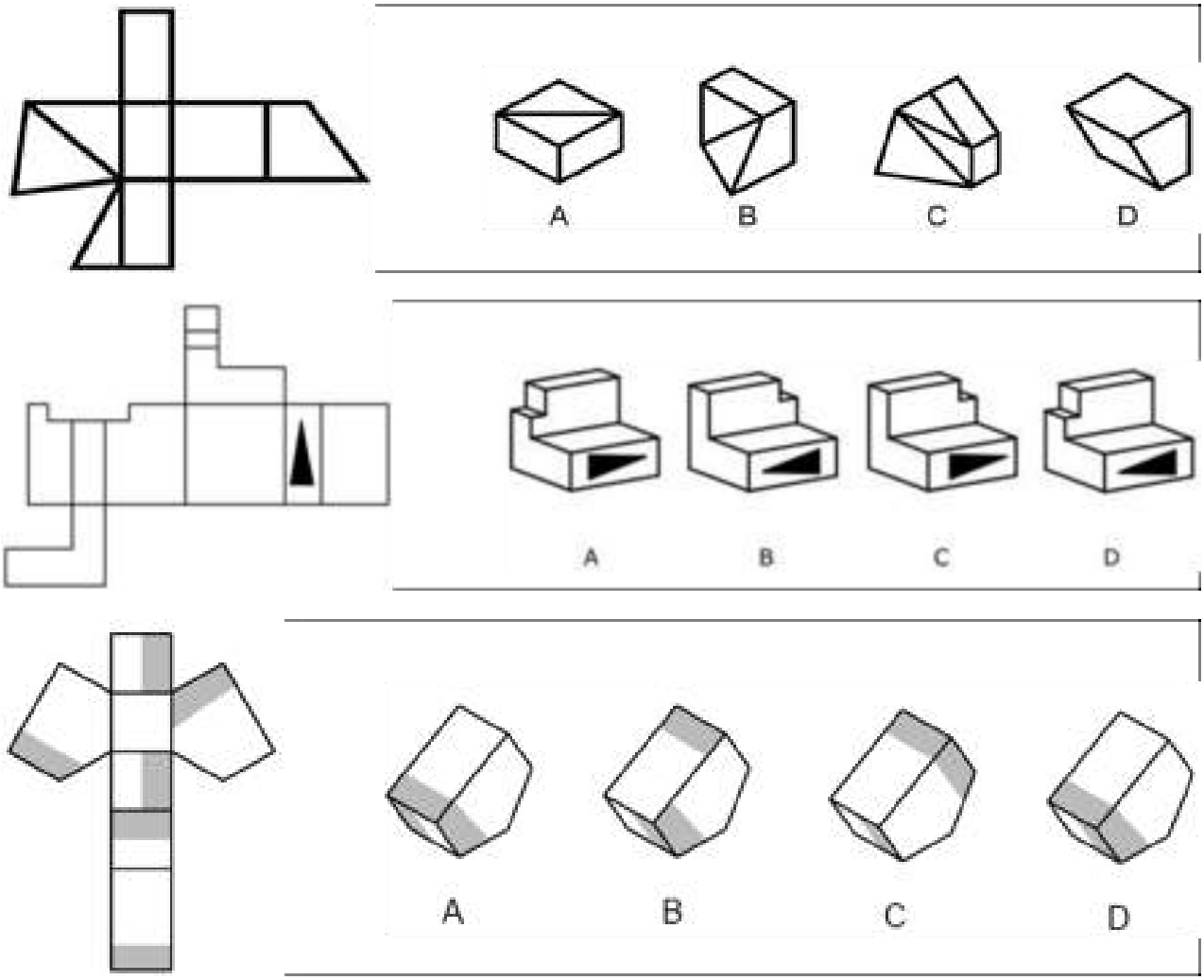


STUDY 4: PATTERNED OPEN SOLID AND CLOSED SHAPE

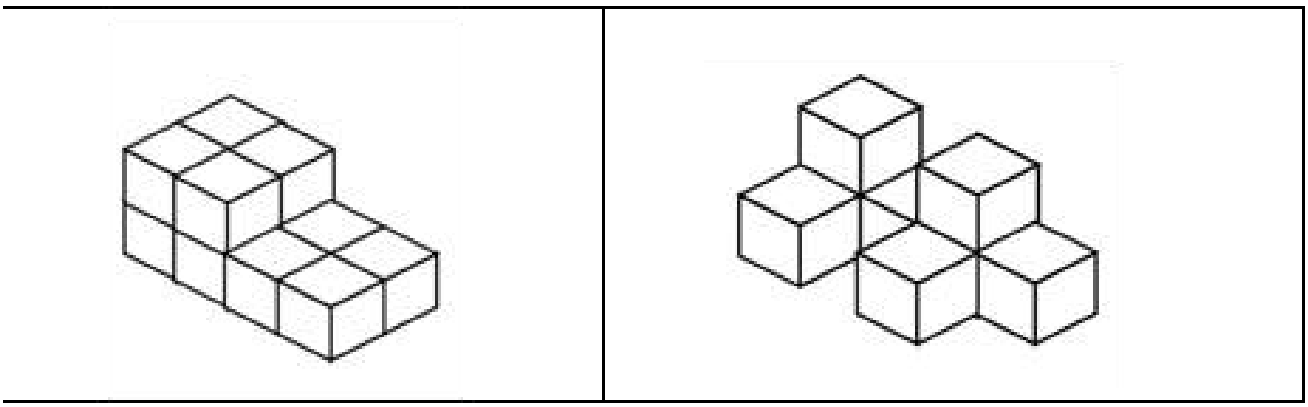
STUDENTS ARE ASKED TO FIND THE CLOSED SOLID DIFFERENT FROM THE CUBE WHICH IS GIVEN AS A NET AND HAS VARIOUS PATTERNS (LETTERS, NUMBERS, SHAPES, ... ETC.) BEING ABLE TO FIND AMONG THE GIVEN OPTIONS.

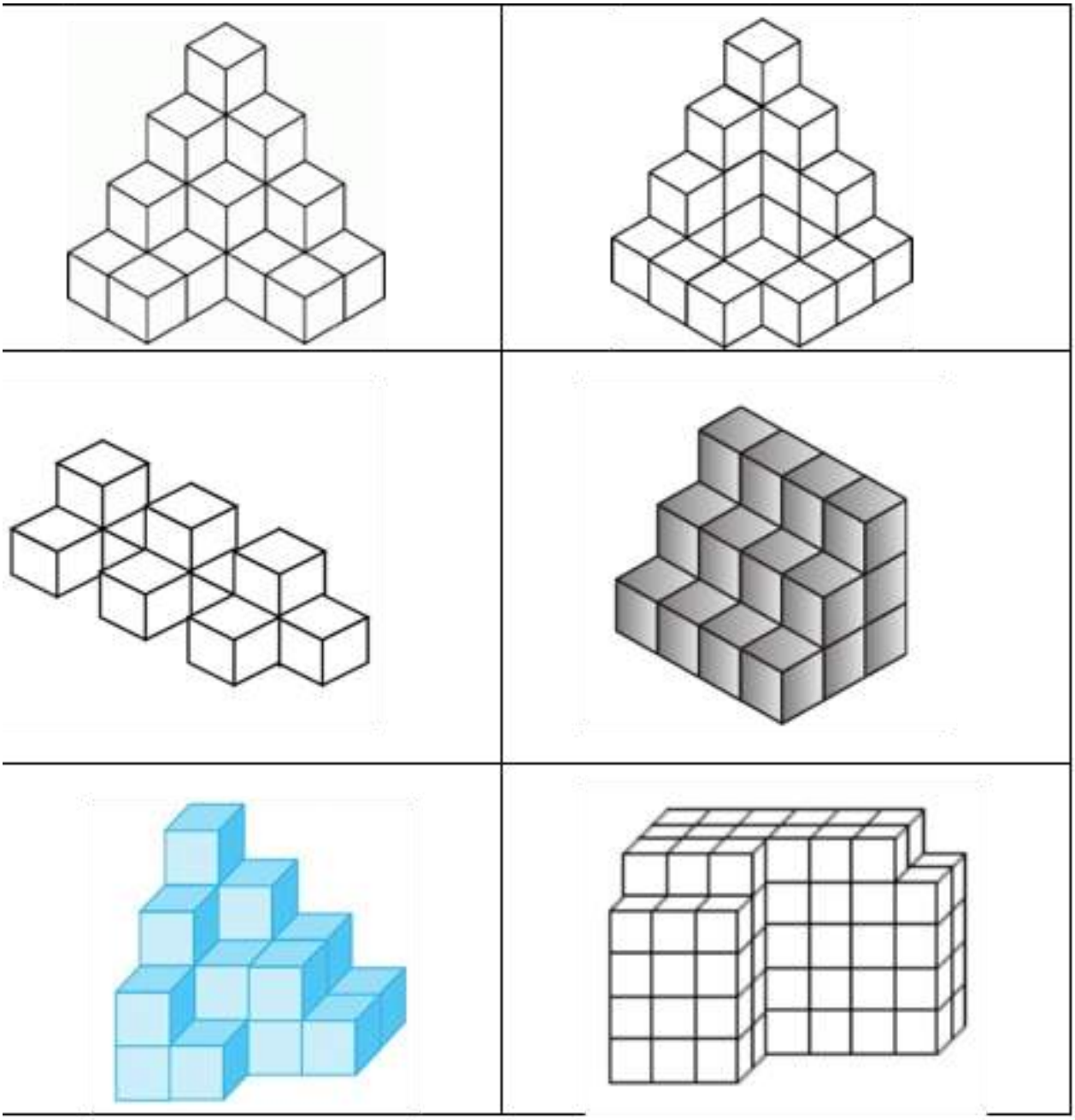




STUDY 5: NUMBER OF UNIT CUBES

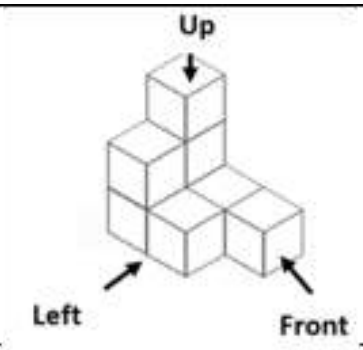
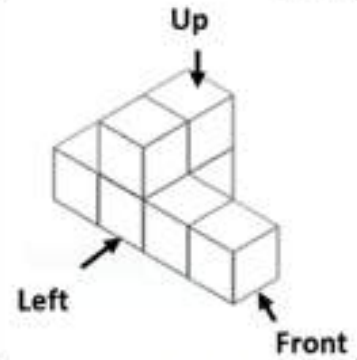
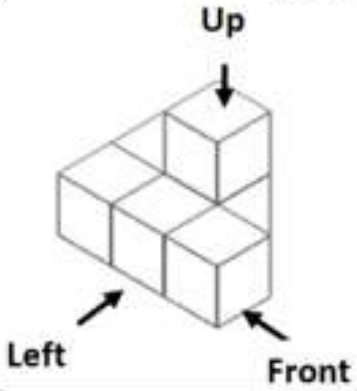
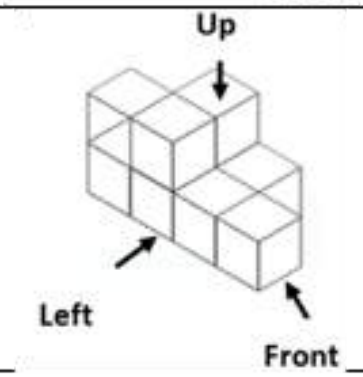
STUDENTS ARE ASKED TO FIND OUT HOW MANY UNIT CUBES ARE IN A SOLID MADE UP OF UNIT CUBES.





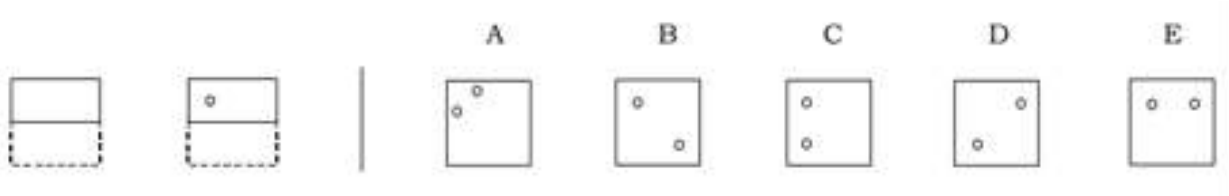
STUDY 6: 2-DIMENSION VIEWS OF 3-DIMENSIONAL SOLID

STUDENTS ARE ASKED TO DRAW A 2-DIMENSION VIEW FROM THE DESIRED DIRECTIONS OF A 3-DIMENSIONAL SOLID (ON THE LEFT) WHICH IS CONSTRUCTED WITH SEVERAL CUBES.

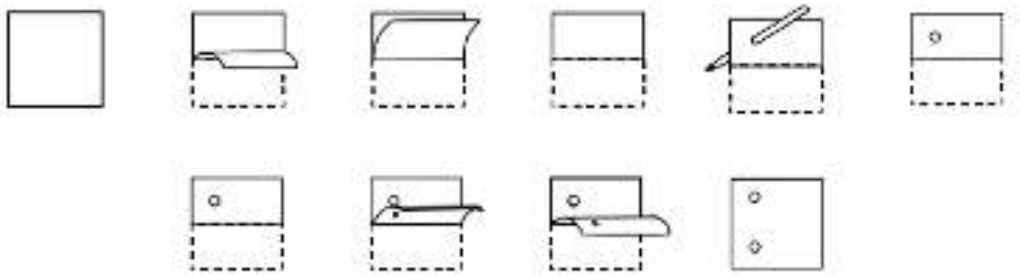
	
	
	
	

STUDY 7: PAPER FOLDING TEST

IN THIS TEST YOU ARE TO IMAGINE THE FOLDING AND UNFOLDING OF PIECES OF PAPER. IN EACH PROBLEM IN THE TEST THERE ARE SOME FIGURES DRAWN AT THE LEFT OF A VERTICAL LINE AND THERE ARE OTHERS DRAWN AT THE RIGHT OF THE LINE. THE FIGURES AT THE LEFT REPRESENT A SQUARE PIECE OF PAPER BEING FOLDED, AND THE LAST OF THESE FIGURES HAS ONE OR TWO SMALL CIRCLES DRAWN ON IT TO SHOW WHERE THE PAPER HAS BEEN PUNCHED. EACH HOLE IS PUNCHED THROUGH ALL THE THICKNESSES OF PAPER AT THAT POINT. ONE OF THE FIVE FIGURES ON THE RIGHT OF THE VERTICAL LINE SHOWS WHERE THE HOLES WILL BE WHEN THE PAPER IS COMPLETELY UNFOLDED. YOU ARE TO DECIDE WHICH ONE OF THESE FIGURES IS CORRECT AND DRAW AN X THROUGH THAT FIGURE. NOW TRY THE SAMPLE PROBLEM BELOW. (IN THIS PROBLEM ONLY ONE HOLE WAS PUNCHED IN THE FOLDED PAPER).

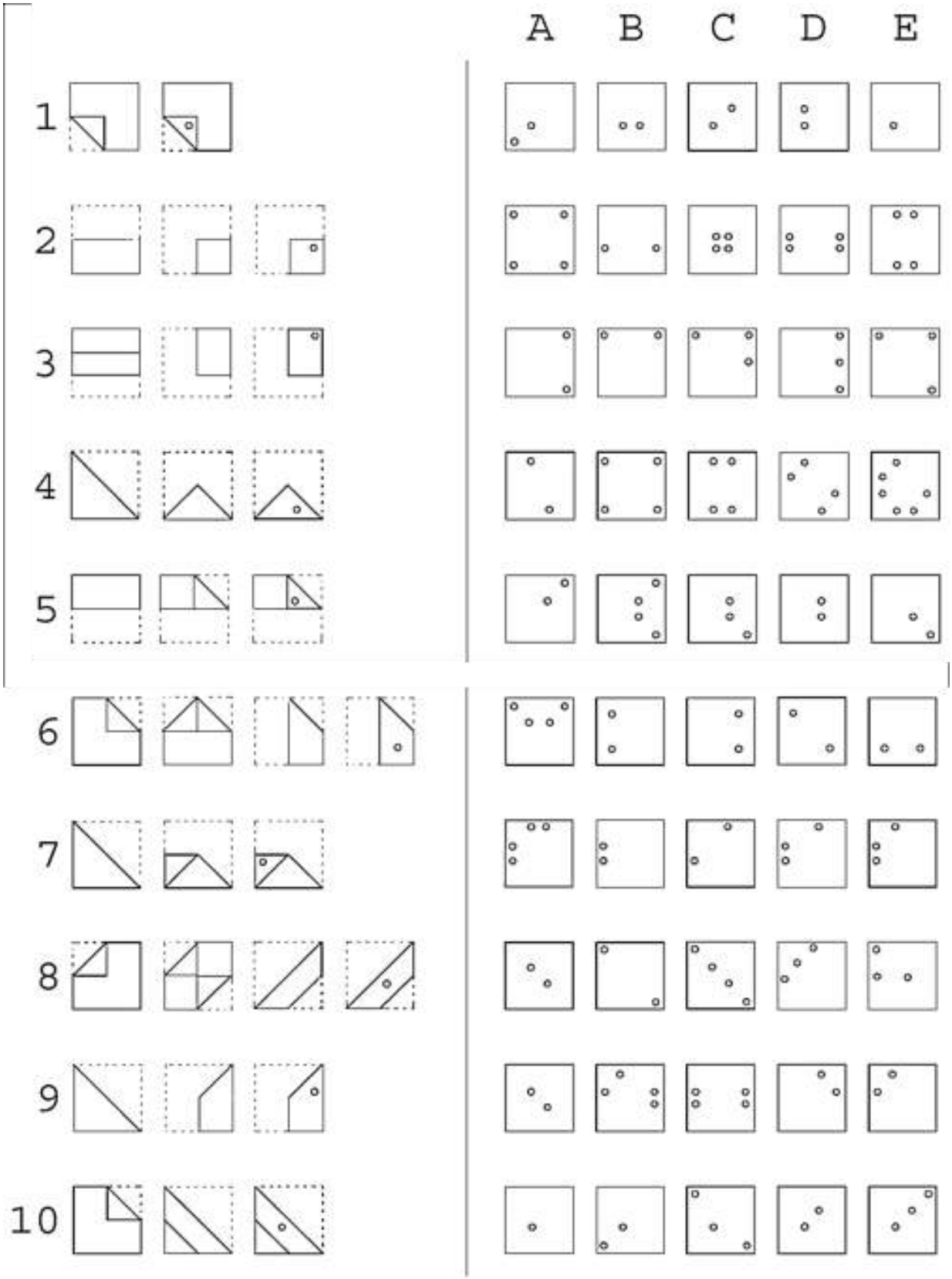


THE CORRECT ANSWER TO THE SAMPLE PROBLEM ABOVE IS C AND SO IT SHOULD HAVE BEEN MARKED WITH AN X. THE FIGURES BELOW SHOW HOW THE PAPER WAS FOLDED AND WHY C IS THE CORRECT ANSWER.



IN THESE PROBLEMS ALL OF THE FOLDS THAT ARE MADE ARE SHOWN IN THE FIGURES AT THE LEFT OF THE LINE, AND THE PAPER IS NOT TURNED OR MOVED IN ANY WAY EXCEPT TO MAKE THE FOLDS SHOWN IN THE FIGURES. REMEMBER, THE ANSWER IS THE FIGURE THAT SHOWS THE POSITIONS OF THE HOLES WHEN THE PAPER IS COMPLETELY UNFOLDED.

THE PAPER FOLDING TEST WAS DEVELOPED BY FRENCH ET AL IN 1963. IN THIS TEST, THE TASK OF THE STUDENTS; FIND OUT THE POSITION OF THE PAPER AFTER OPENING WHICH FOLDED AND HOLED IN VARIOUS POINTS.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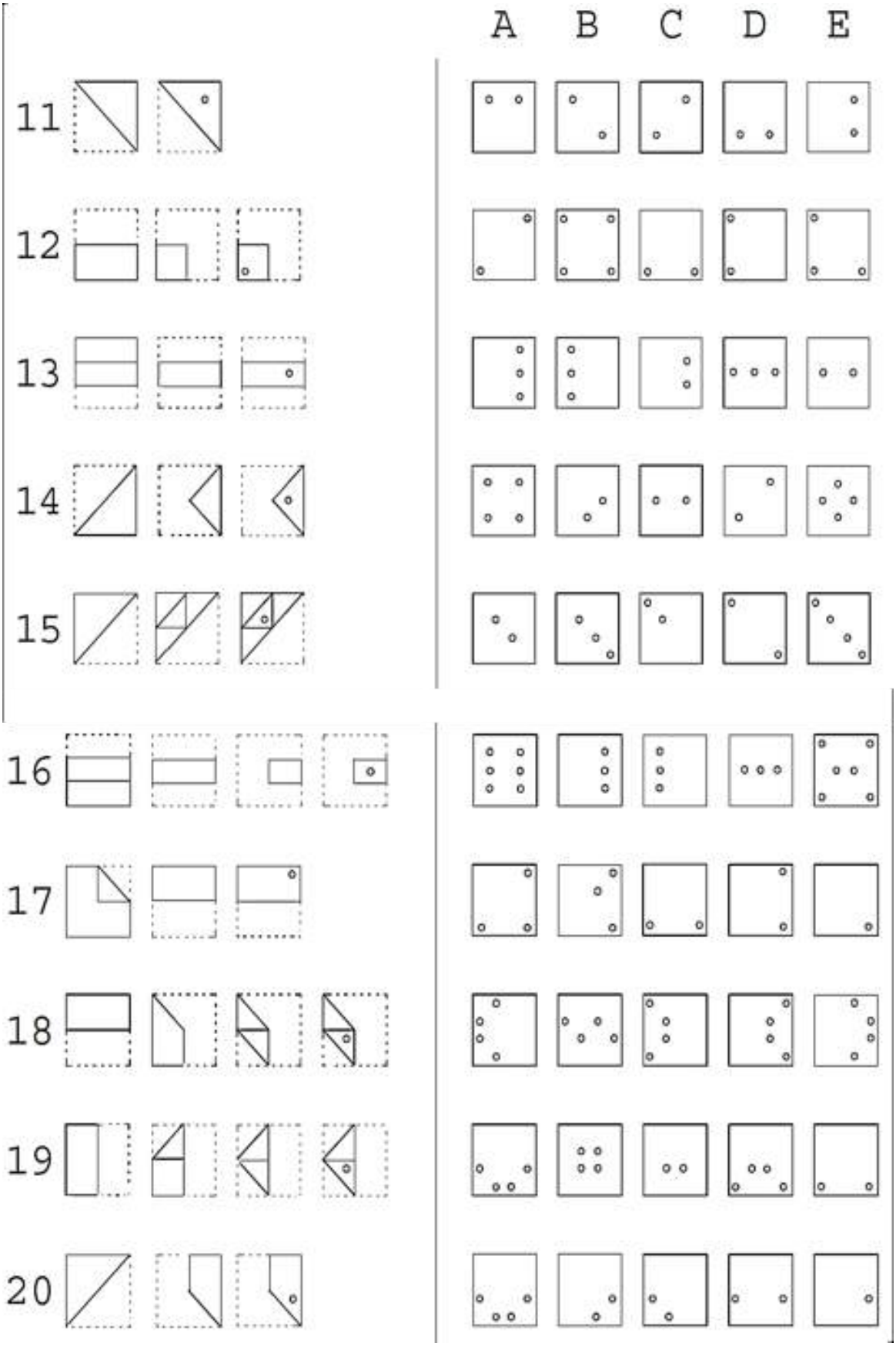
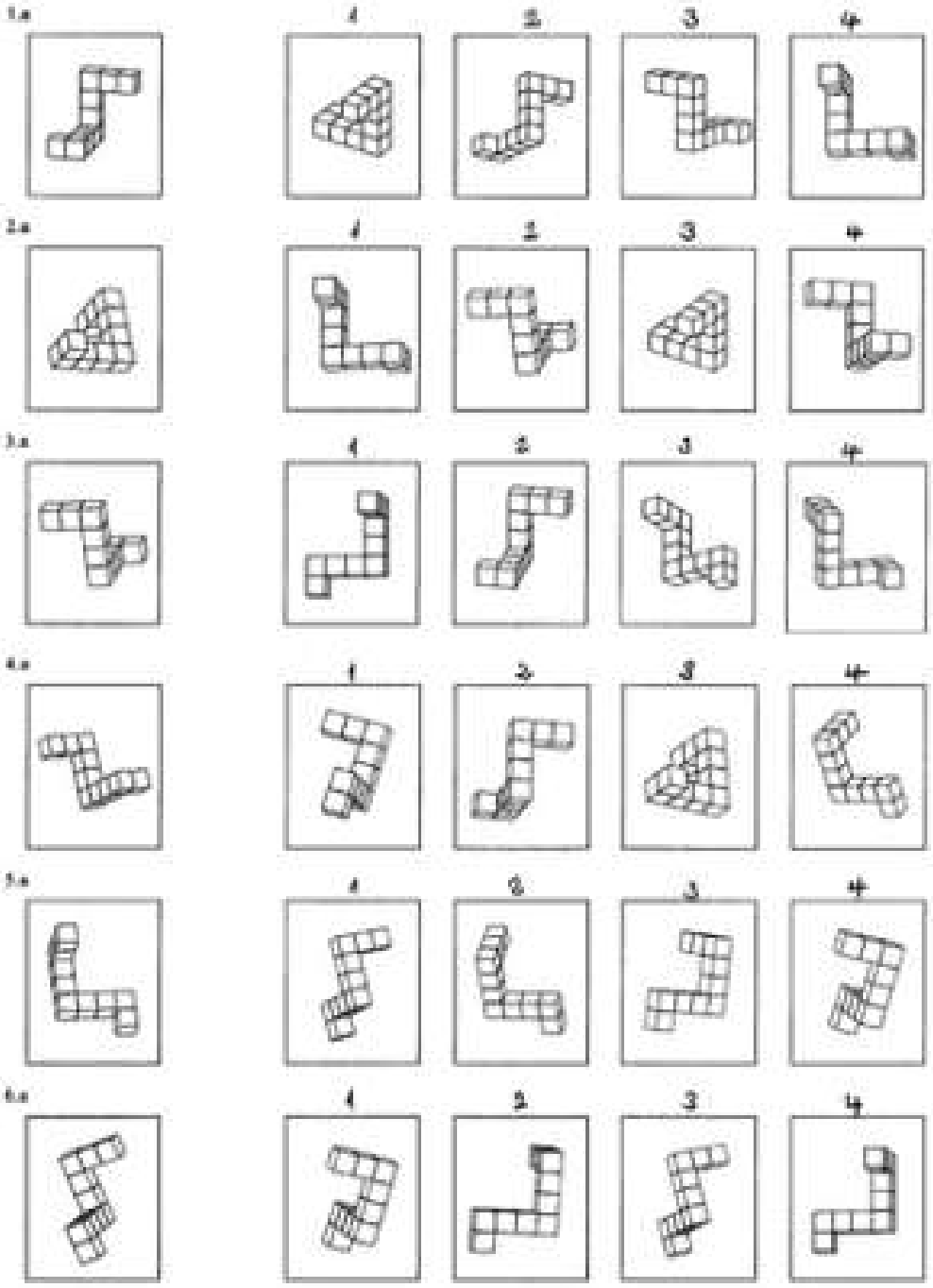


STUDY 8: FROM DIFFERENT POSITIONS ROTATION VIEWS OF 3-DIMENSIONAL SOLIDS

STUDENTS ARE ASKED TO FIND THE ROTATED FORMS OF SOLID CONSISTING OF UNIT CUBES AMONG THE GIVEN OPTIONS.

THE MENTAL ROTATION TEST CONTAINS SHAPES PREPARED BY METZLER & SHEPARD (1978). ON THE MENTAL ROTATION TEST EACH ITEM CONSISTS OF A ROW OF FIVE LINE DRAWINGS, INCLUDING A GEOMETRICAL TARGET FIGURE IN THE LEFT MOST POSITION FOLLOWED BY FOUR RESPONSE-CHOICE FIGURES: TWO ROTATED REPRODUCTIONS OF THE TARGET AND TWO DISTRACTORS. THE STUDENT'S TASK IS TO INDICATE WHICH TWO OF THE FOUR RESPONSE CHOICE FIGURES ARE ROTATED REPRODUCTIONS OF THE TARGET FIGURE.



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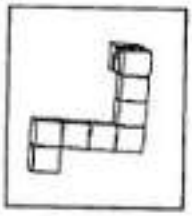

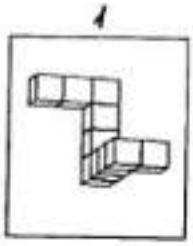

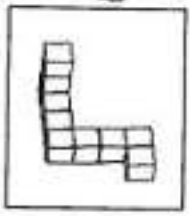

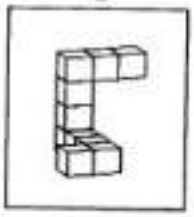

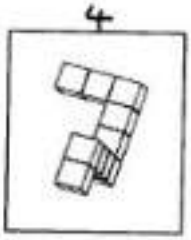

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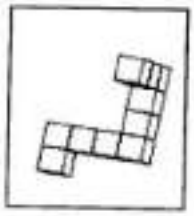

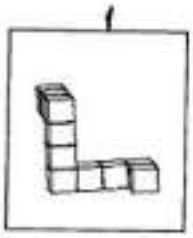

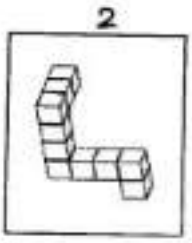

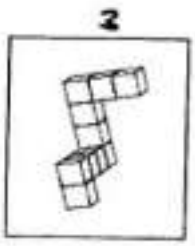

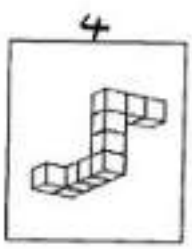

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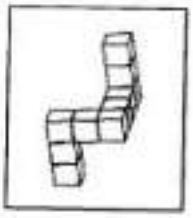

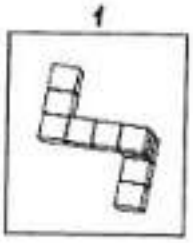

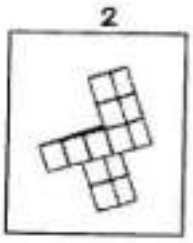

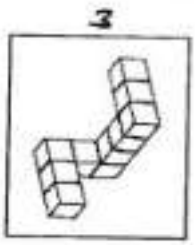

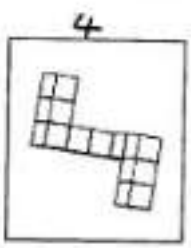

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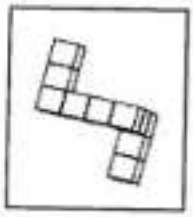

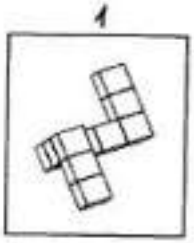

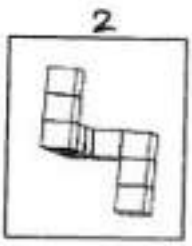

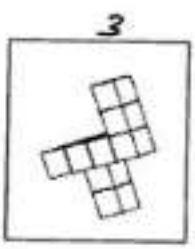

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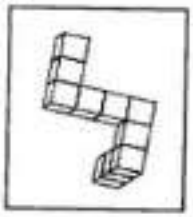

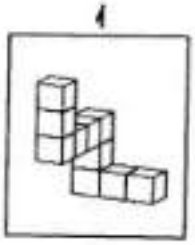

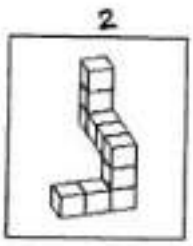

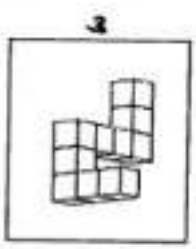

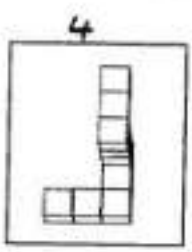

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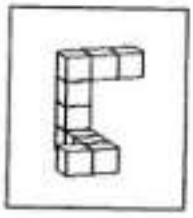

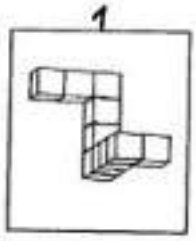

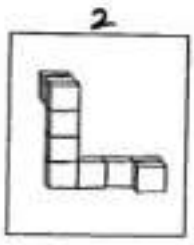

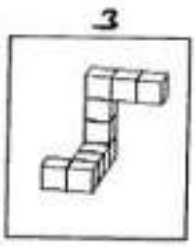

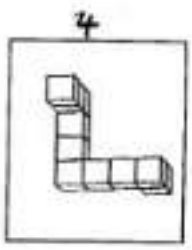

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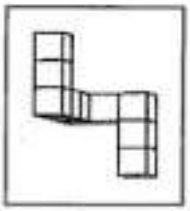

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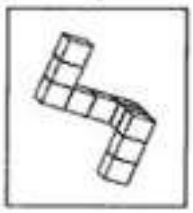

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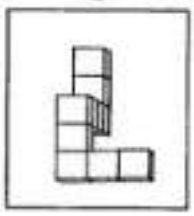

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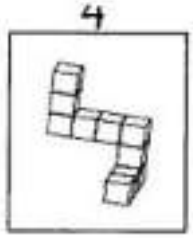

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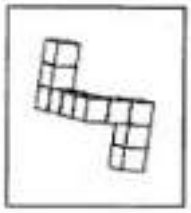

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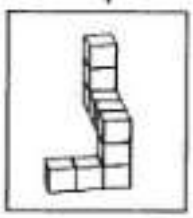

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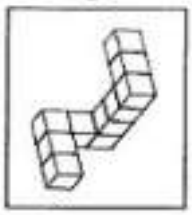

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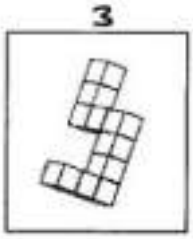

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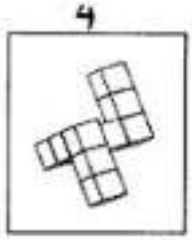

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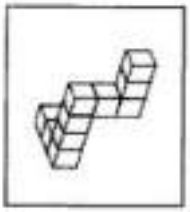

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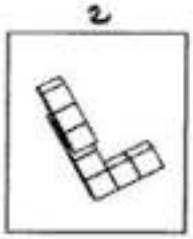

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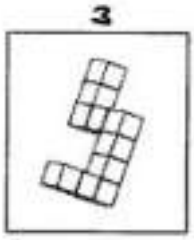

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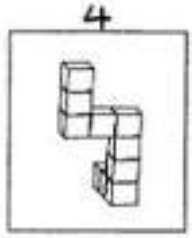

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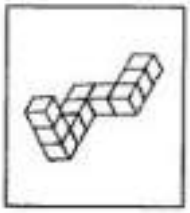

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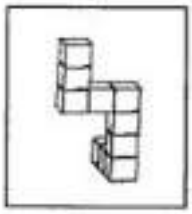

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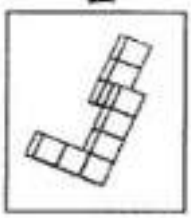

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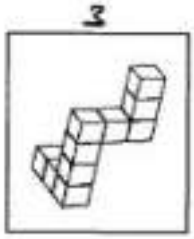

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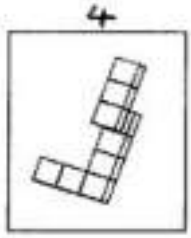

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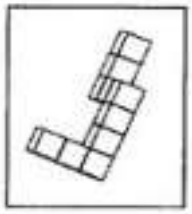

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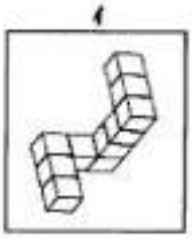

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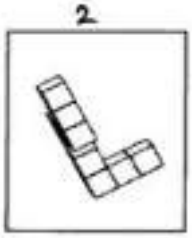

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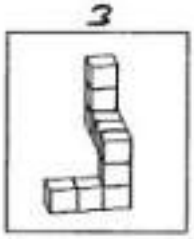

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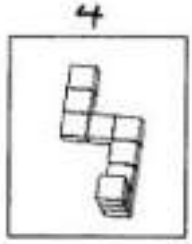

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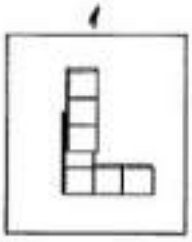

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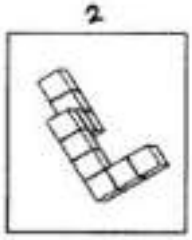

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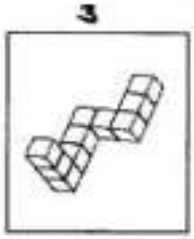

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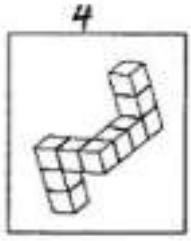
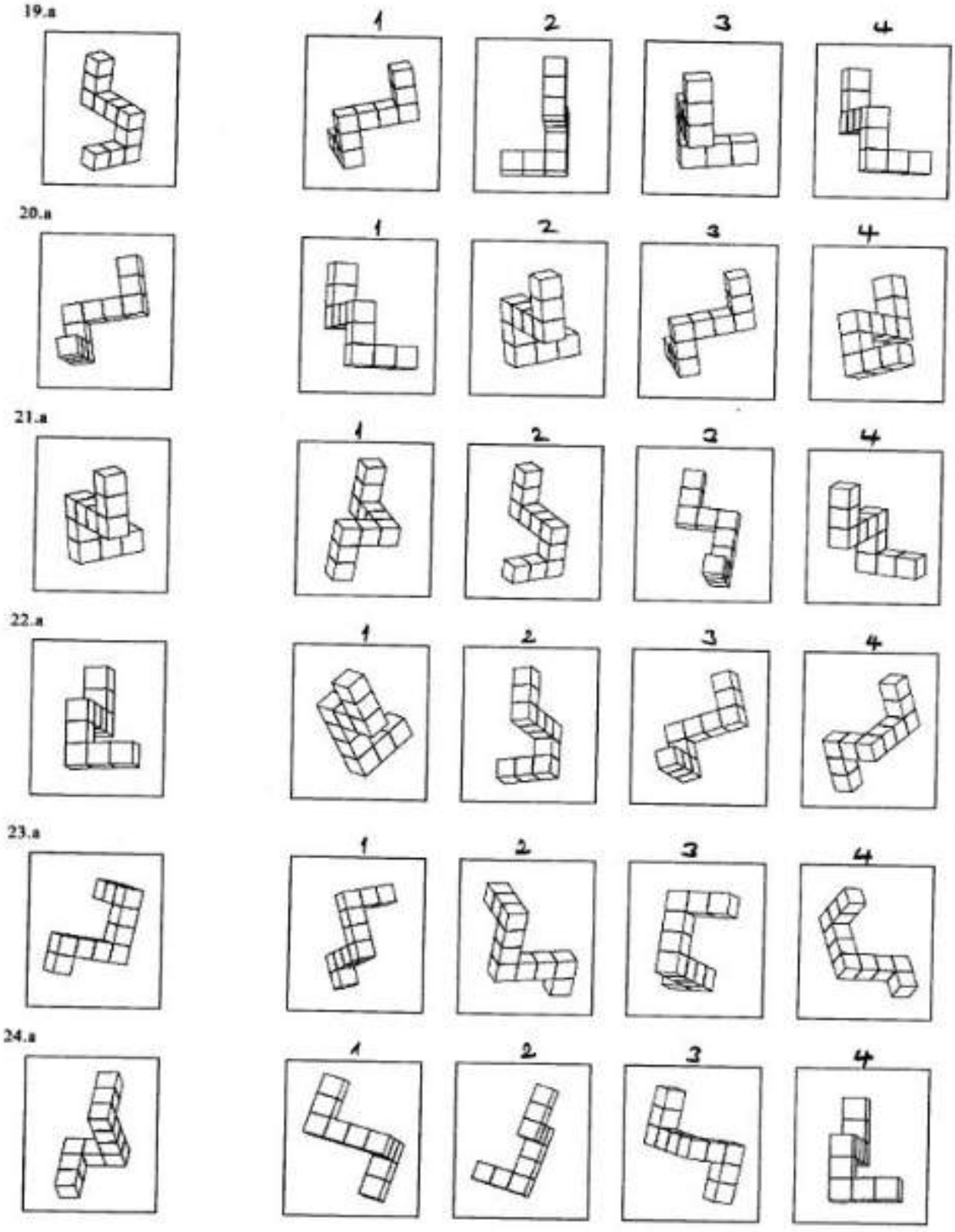
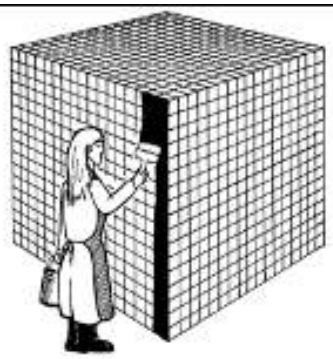
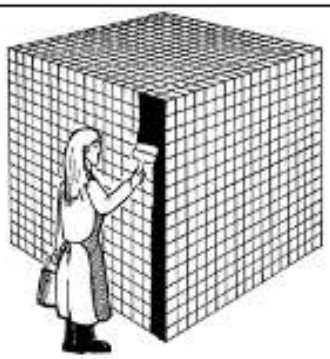




STUDY 9: THE NUMBER OF PAINTED FACES OF THE UNIT CUBES FORMING THE PRISMS

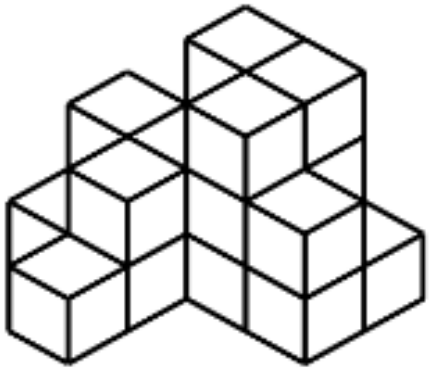
PRISMS WHOSE OUTER SURFACE IS COMPLETELY PAINTED IN A SINGLE COLOR AND CONSIST OF UNIT CUBES; BEING ABLE TO DETERMINE THE NUMBER OF UNPAINTED UNIT CUBES AND THE NUMBER OF PAINTED ONES WITH ONE FACE, TWO FACES, THREE FACES AMONG THE UNIT CUBES FORMED WHEN THEY ARE BROKEN INTO UNIT CUBES.

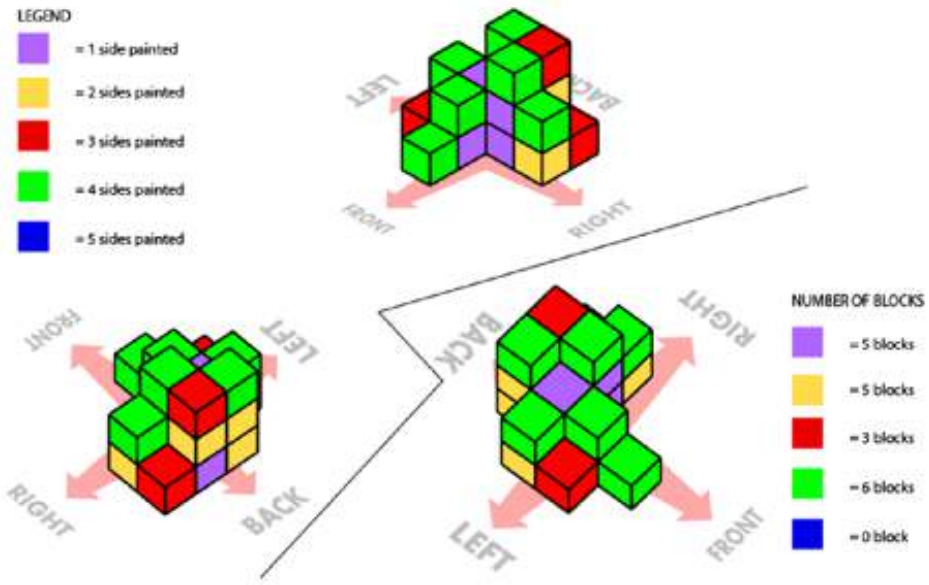
<table>
<tr><td>  </td><td>All outer surfaces of the 7x7x7 prism, which is formed by the combination of unit cubes, are painted blue.
This prism is then divided into unit cubes. In this case:</td></tr>
<tr><td>How many unit cubes are there with one side painted?</td><td>How many unit cubes are painted on both sides?</td></tr>
<tr><td>How many cubes are there with three faces painted?</td><td>How many unit cubes are there that have none of their faces painted?</td></tr>
<tr><td colspan="2">Let's formulate the above question.</td></tr>
<tr><td>  </td><td>All outer surfaces of the nxnxn prism, which is formed by the combination of unit cubes, are painted blue.
This prism is then divided into unit cubes. In this case:</td></tr>
<tr><td>How many unit cubes are there with one side painted?</td><td>How many unit cubes are painted on both sides?</td></tr>
</table>

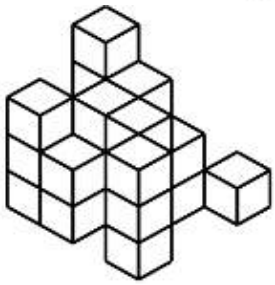
How many cubes are there with three faces painted?	How many unit cubes are there that have none of their faces painted?

STUDY 10: THE NUMBER OF PAINTED FACES OF THE UNIT CUBES FORMING THE NON-PRISM SOLIDS

SOLIDS THAT ARE NOT PRISMS, WHOSE OUTER SURFACE IS COMPLETELY PAINTED IN A SINGLE COLOR AND CONSIST OF UNIT CUBES; BEING ABLE TO DETERMINE THE NUMBER OF UNIT CUBES WITH ONE FACE, TWO FACES, THREE FACES, FOUR FACES, FIVE FACES, AND THE NUMBER OF UNPAINTED UNIT CUBES FORMED WHEN THEY ARE BROKEN INTO UNIT CUBES.

	All outer surfaces of the non-prism solid , which is formed by the combination of unit cubes, are painted one color. In this case; on this solid, How many unit cubes are there that have none of their faces painted? How many unit cubes are there with one side painted? How many unit cubes are there with both painted? How many unit cubes are there with three painted? How many unit cubes are there with four painted? How many unit cubes are there with five painted?
Çözüm / Solution	





ALL OUTER SURFACES OF THE NON-PRISM SOLID , WHICH IS FORMED BY THE COMBINATION OF UNIT CUBES, ARE PAINTED ONE COLOR. IN THIS CASE; ON THIS SOLID,
HOW MANY UNIT CUBES ARE THERE WITH ONE SIDE PAINTED?
HOW MANY UNIT CUBES ARE THERE WITH THREE PAINTED?
HOW MANY UNIT CUBES ARE THERE WITH FIVE PAINTED?

STUDY 11: INTERNATIONAL MATH QUESTIONS-SOLUTIONS

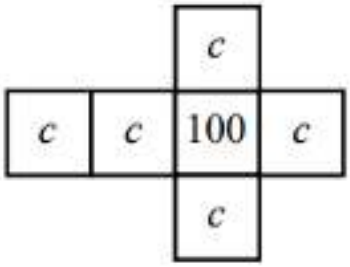
MOVING TO THE IMPLEMENTATION PHASE. TO BE ABLE TO SOLVE QUESTIONS IN THE DIMENSIONS OF ANALYSIS AND SYNTHESIS, MOSTLY AT THE ABSTRACT LEVEL, WHICH APPEARED IN INTERNATIONAL MATHEMATICS COMPETITIONS.

QUESTION 1) (2016 GAUSS CONTEST) THE EIGHT VERTICES OF A CUBE ARE RANDOMLY LABELLED WITH THE INTEGERS FROM 1 TO 8 INCLUSIVE. JUDITH LOOKS AT THE LABELS OF THE FOUR VERTICES OF ONE OF THE FACES OF THE CUBE. SHE LISTS THESE FOUR LABELS IN INCREASING ORDER. AFTER DOING THIS FOR ALL SIX FACES, SHE GETS THE FOLLOWING SIX LISTS: (1, 2, 5, 8),(3, 4, 6, 7), (2, 4, 5, 7),(1, 3, 6, 8),(2, 3, 7, 8), AND (1, 4, 5, 6). THE LABEL OF THE VERTEX OF THE CUBE THAT IS FARTHEST AWAY FROM THE VERTEX LABELLED 2 IS

QUESTION 2) (2019 GAUSS CONTEST) AN 8 × 8 × N RECTANGULAR PRISM IS MADE UP FROM 1 × 1 × 1 CUBES. SUPPOSE THAT A IS THE SURFACE AREA OF THE PRISM AND B IS THE COMBINED SURFACE AREA OF

THE 1 × 1 × 1 CUBES THAT MAKE UP THE PRISM. WHAT IS THE SUM OF THE VALUES OF N FOR WHICH B/A IS AN INTEGER?

QUESTION 3) (2021 GAUSS CONTEST) JONAS HAS 1728 COPIES OF A 1 × 1 × 1 CUBE WITH THE NET SHOWN, WHERE C IS A POSITIVE INTEGER AND C < 100. USING THESE 1728 CUBES, JONAS BUILDS A LARGE 12×12×12 CUBE IN SUCH A WAY THAT THE SUM OF THE NUMBERS ON THE EXTERIOR FACES IS AS LARGE AS POSSIBLE. FOR SOME VALUES OF C, THE SUM OF THE NUMBERS ON THE EXTERIOR FACES IS BETWEEN 80000 AND 85000. THE NUMBER OF SUCH VALUES OF C IS



SCENARIO MARINE POLLUTION AND MICROPLASTICS

PART 1. OF SCENARIO

TITLE	**Marine pollution and microplastics**
MAIN SUBJECT	**Natural Sciences**
OTHER SUBJECTS/DISCIPLINES	**Technological Education** **Visual Arts**
TYPE	*Larger educational project*
DURATION OF CLASSES	*Number of lessons: study visit/virtual tour + 8 x 90m*
AGE OF STUDENTS	**15 –16 years old**

PART 2. OF SCENARIO

AIM OF CLASSES		By adressing the issue of plastic pollution and microplastics, we intend students to: Discuss and solve real-life problems, simultaneously showing the potential of interdisciplinary relationships between Natural sciences, Technological Education and Visual Arts. Become more aware, as well as the entire educational community, of the problem of waste production, especially plastic and how it interfeers with ecosystems. Develop multiple literacies that allow them to assess and select information, formulate hypotheses and make informed decisions in their daily life; Distinguish and carry out the different stages of a project: identification, research, realization and evaluation. Work together for a common aim, managing interests, talents and personalities. Strengthen their creativity by expressing their feelings and emotions through art.
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Understand ecosystem organization and the dynamics of interaction between living beings and the environment Understand waste production and its interference with ecosystems, especially plastic Use online tools appropriate to a planned research

		Process and organizedata in different formats Get acquainted with waste-art and waste artists
	IN THE FIELD OF SKILLS	Identify technical requirements, constraints and resources for implementing projects. Develop problem-solving abilities. Develop critical thinking and creativity;
	IN THE FIELD OF SOCIAL COMPETENCES	Develop collaborative teamwork Improve communication skills Develop people management skills Raise environmental and social awareness and responsibility.
TEACHING METHODS	Active pedagogical methodologies using methods and strategies that promote participation: • Buzz Groups • Brainstorming • Project-based learning • Learn-by-doing	
SUGGES-TED TEACHING TOOLS/ MATER-IALS NEEDED	**Materials:** • Computer • Board • Projector • Drawing material: Pen and paper • Mobile phones to collect photos • Plastic waste • Other waste materials • Glue gun and glue sticks • Scissors; X-acto cutter knife • Candles (to melt plastic and reshape it) • Rivet machine and rivets • Bags and gloves **Online tools:** • Padlet • Beat the microbead app	

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARAC-TERISTICS	**Students are expected to:** Natural Sciences Systematize trophic chains of aquatic and terrestrial environments predominant in the region surrounding the school, preferably the same as those mentioned during the virtual/real study visit to the museum. Interpret trophic chains, starting from different examples of food webs. Critically analyze examples of human actions that negatively impact food webs, discussing measures to minimize them in ecosystems. Discuss causes and consequences of changing ecosystems, justifying the importance of dynamic balance in ecosystems and the way in which their management can contribute to achieving the goals of sustainable development. Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation. Technological Education Distinguish the different stages of a project: identification, research, realization and evaluation. Identify technical specifications, conditionalisms and resources in carrying out a project. Create technological solutions that are environmentally sustainable by reusing and recycling waste materials. Visual Arts Reflect on cultural manifestations of local and global heritage (artworks and artefacts - painting, sculpture, drawing, assemblage, collage, installation). Autonomously select work processes and ideas through research, investigation and experimentation. Manifest expressiveness in their work, intentionally selecting concepts, themes, materials, supports and techniques. Organize individual or group exhibitions in different formats – physical and/or digital.
BASIC TERMS	Ecosystem organization; Food webs; Food chains; Sustainable development ; Pollution; Plastics; Microplastics, Bordallo, Waste to art.

STRUC-TURE	Study-visit/vir-tual tour All subjects	**Virtual or real study-visit to the Whale Museum of Madeira orto any other Marine Science Museum** STEP 1 - Students go on a guided of the museum, oriented by the biology teacher and/or the Museum's Educational Department. STEP 2 - Students visit the laboratory where biologists work in the observation, investigation and conservation of marine species. https://www.youtube.com/watch?v=dc_qL12A0h0 - 30 anos de Museu da Baleia – virtual tour accessed 06/05/2022 STEP 3 – For homework, students are asked to use https://padlet.com to share a text about their marine museum experience. Padlet Tutorial (https://youtu.be/sFqTuD434zw) accessed 01/04/2022
	Lesson 1 Natural Sciences	STEP 1 - Teacher elicits and clarifies concepts such as biotic interactions-predation, herbivorism, food webs, food chains and food pyramids (or uses the PPT presentation attached) to explore the organization of the ecosystems mentioned in the visit. STEP 2 – Students are handed out cards with images of different marine species, which they should use to form food webs and/or food chains (attachment 1) STEP 3 – Students are challenged with the question: "Can plastics enter food webs?" and are expected to exchange ideas about it with their classmates. STEP – Students watch a video "Plastic Debris in the Ocean" (*https://www.oceancare.org/en/topical/media-center/*) (accessed 01/04/2022), to raise their awareness on how plastics impact ecossystems. STEP 5 – Students are asked to play a Kahoot (to edit and use this Kahoot see link: https://create.kahoot.it/share/plastics-and-the-oceans/fb2f47a3-e791-44dc-81e5-fbe93adf0a61) STEP 6 – Students are required to bring different personal care products and cosmetics (soap, shower gel, shampoo, face cream, body lotions, exfoliating cream) to be analysed in the next Natural Sciences class.
	Lesson 2 All subjects	STEP 1: Beach or street cleaning action in which students and teachers collect several types of waste. STEP 2: The collected waste is to integrate an artistic project and to be used in the next Natural Sciences class.

	Lesson 3 Natural Sciences	STEP 1 – In groups, students are asked to order the different types of waste collected in the previous lesson (plastic bottles, paper towels, cigarette butts, pieces of cloth, soda cans...) by what they believe is their time of degradation. STEP 2 – Groups comment on the results of this activity and compare them with the real time of waste degradation. (Attachment 2) STEP 3 – Students are asked to install the Beatthemicrobead app on their phones (https://www.beatthemicrobead.org/download-btmb-app/) accessed 01/04/2022) STEP 4 – Using the app students scan different cosmetic and personal care products to find out if they contain plastic ingredients. STEP 5 – In a large group discussion, students brainstorm ideas to replace and reduce plastic items and plastic-containing products and cosmetics and add their ideas to a word cloud activity (*mentimeter.com* or equivalent) Students may further explore the European Parliament page on this topic: https://www.europarl.europa.eu/news/en/headlines/priorities/fighting-plastic-pollution/20180830ST011347/how-to-reduce-plastic-waste-eu-strategy-explained (20/05/2022)
	Lesson 4 Visual Arts Techno-logical Educa-tion	STEP 1 – Students are challenged to develop a project/artistic creation from the waste they collected and are presented with the inspiration of artist Boradalo 11. STEP 2 – Students are shown this video about his work: Bordalo 11: A Life of Waste | Short Film | 2017 Real Shorts: *https://www.youtube.com/watch?v=1T5HnkJ-yik* (25/03/2022) STEP 3 – Students and teacher analyze Bordalo's work (video and website https://www.bordaloii.com/ accessed 25/03/2022), paying special attention to the composition, the materials used, the predominant visual elements, how the shapes relate to each other forming a work with coherence and to the message inherent to the work.
	Lesson 5 Visual Arts + Techno-logical Educa-tion	STEP 1 – Based in Bordalo's work and its analysis carried out in the previous lesson, their own ideas or others resulting from research, students select from the collected waste materials and draw individual sketches of a sculpture. STEP 2 – Once the sketches are finished, students color them with colored pencils. STEP 3 – Students discuss and select the best one to be carried out in the Technological Education class.

	Lessons 6 / 7 / 8 (3x90 min) Visual Arts + Techno-logical Educa-tion	**Artistic intervention** With the teachers guidance, students devise a work plan for the construction of their chosen sculpture project and work together to organize the different required tasks to accoomplish it.
	All subjects	**Presentation of the project to the school/community:** Depending on available space, the exhibition of the students' sculptures may take place in the school's grounds or on any other public space or event, adequatly publicised through available media.

PART 4. OF SCENARIO

RISKS AND SUGGESTED SOLUTIONS	Risk: Students don't bring the required personal care items and cosmetics to be analysed in class - Solution: Teacher has a variety of alternative products to be analysed. Risk: Types and/or size of the waste collected are not suitable to de development of the art. Project - Solution: Ask students to bring other waste materials.

References

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What are Microplastics?:
O que são Microplásticos? Accessed 20/05/2022

PART 1. OF SCENARIO

TITLE	**Digital Literacy - How to Properly Use Technology**
MAIN SUBJECT	**Communication and Modern Technologies**
OTHER SUBJECTS/DISCIPLINES	**Humanities**
TYPE	Larger educational project
DURATION OF CLASSES	3 lessons x 90 minutes
AGE OF STUDENTS	**Students between the ages of 13-18**

PART 2. OF SCENARIO

AIM OF CLASSES	Technology is nowadays an essential element of our daily lives and has changed the way people communicate, exchange ideas and be educated. This rapid technological advantage has emerged as a reality for the school environment, where teachers and students use a wide range of digital means to search for information, communicate and learn. During the COVID-19 pandemic, online classes were the main teaching method on a worldwide scale. Students in a short period of time had to increase their familiarity with technology in order to keep up with the new digital educational normality. Being digitally educated does not constitute a temporary skill rather it is a fundamental skill to live, work, and thrive in the modern digital society. To put it in another way, being digitally literate is essential for all global citizens in the modern world. Making students digitally educated is of utmost importance as they can develop technological skills, critical thinking skills, an awareness of the necessary standards of behaviour expected in online environments as well as an understanding of the shared social and issues created by digital technologies. In this context, the present educational project introduces the concept of "digital literacy" with the aim to let students acquire all the essential knowledge about using technology safely, responsibly, and effectively. In addition, the proposed educational project covers topics about e-safety and "fake" news; essential issues on digital literacy.

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • learn how to proper user technology • learn how to navigate and interact on digital channels safely and responsibly (establish good online security practices) • learn how to look critically at the vast amount of information available on the web and understand what is most reliable and relevant (recognize real from "fake" news) • learn to identify Internet based threats and protect themselves • handle data appropriately
	IN THE FIELD OF SKILLS	Students can gain a number of useful skills and competencies such as: • critical thinking • problem solving • filtering information • decision making • self-awareness • emotional intelligence
	IN THE FIELD OF SOCIAL COMPETENCES	By engaging with digital literacy students can: • develop respect towards different opinions • develop a sense of self-protection and protection of the others • become more responsible for themselves

TEACHING METHODS	Introducing digital literacy to students can not be achieved without **interactive/participative/experiential teaching methods**. In particular, it is a prerequisitie students' active: • engagement • involvement • participation • interaction • contribution In conjunction with the aforementioned teaching methods, the following ones will also be used: • • creative learning: constructivist, collaborative, integrative learning • thinking based learning • problem-based learning: discussion, group work • student centered approach: students build on their own experiences • multimedia approach: YouTube videos

SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	• Computer • Internet • Multimedia Projector • Pens, paper, markers • Whiteboard • Handouts that the teacher will distribute • Printer
PRELIMINARY CONDITIONS (if applicable)	Any preliminary conditions are applicable
TIPS / METHODOLOGICAL REMARKS	For the successful implementation of the present educational project and in order for students to reap its full benefits, it is recommended the close collaboration between an ICT teacher with the principal educator who will give the offered lessons. The expertise of an ICT teacher will undoubtedly give added value.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	**Introducing Digital Literacy** "Digital literacy should be the fourth pillar of a child's education alongside reading, writing and mathematics and be resourced and taught accordingly." House of Lords Report, 2017 Introducing to children digital literacy is of utmost importance. In today's digital world, children need to be able to understand and use effectively. Digital literacy is not just about knowing how to take a selfie or post on social media. Digital literacy means understanding technology and using it appropriately. The focus of this introductory lesson is upon introducing to children the concept of "digital literacy" and its importance. What exactly is digital literacy about? Theory, through funny video will be presented to students in order to gain the best possible knowledge. Group discussion and quiz is also envisaged. By the end of the course, students should be capable of understanding digital literacy and its importance. **Introducing E-Safety** Issues related to online safety should form a fundamental part of schools' safeguarding and children protection measures. Introducing e-safety to the secondary school classrooms will help pupils to develop the skills needed to use technology safely and responsibly, and provide them with the opportunity to make the most of the benefits it provides. The focus of the lesson is to introduce students to the different types of online dangers and recommend precautionary measures and tips to use the internet safely and responsibly.

<table>
<tr><td>LEARNING CONTENT - DETAILED CHARAC-TERISTICS</td><td colspan="2">Colorful infographics, leaflets, group discussions and videos are included in the structure of the lesson. Special part of the lesson constitutes the role of digital literacy in today's global citizenship. The well-known "9 Key Ps" of digital citizenship are presented to students.

"Fake" News

Have you ever thought about how difficult is for adults to recognise real from "fake" news? The answer is extremely difficult, even more difficult for children. With a considerable number of sources of information available online, it has become challenging to differentiate what content is based on fact or lies. Websites that share things we believe to be true; may not be. This can be especially dangerous for children, who have not stabilized yet their personalities and can become easily influenced. They may be persuaded to believe distorted views of the world that could cause them to harm in the real world. The present lesson seeks to explain to students what fake news is and how we can evaluate information in terms of accuracy and credibility. Group discussion, exercises and videos will prove to be the main educational "tool" for teaching to children the concept of "fake" news.</td></tr>
<tr><td>BASIC TERMS</td><td colspan="2">digital literacy, e-safety, digital citizenship, fake news</td></tr>
<tr><td>STRUC-TURE</td><td>LESSON 1 – Introdu-cing Digital Literacy</td><td>STEP 1
The teacher introduces Digital Literacy by presenting to students a short video under the title "Digital literacy and why it matters"

The video is available on YouTube: https://bit.ly/3JMxoUJ

STEP 2
The teacher starts asking the following proposed question, in order to give students the opportunity, through personal examples and experiences, to uncover the multiple roles of technology.

• How do you use technology (e.g. for learning purposes, for leisure etc.)?

STEP 3
The teacher organizes students into groups of four or six.

STEP 4
The teacher introduces to students the Digital Literacy Vocabulary Quiz with the aim to familiarize themselves with basic terms and concepts.

STEP 5
The teacher writes on the whiteboard the following:</td></tr>
</table>

		Digital Literacy Vocabulary Quiz Test your digital literacy vocabulary! Algorithm: AirDrop: Anti-Virus: Backup: Bias: Bluetooth: Browser: Cite: Cookies: Digital footprint: Fake news: Hacker: Propaganda: Spam: **STEP 6** The teacher asks each group to share their best guess at the definition for each word.
	LESSON 2 – Introducing E-Safety	**STEP 1** The teacher introduces to students the different types of online dangers that exist by presenting them the following infographic.

		STEP 2 The teacher opens up a discussion with students about other possible types of online dangers (e.g., Internet addiction etc.) STEP 3 The teacher presents to students the places where those dangers are usually found. Informative leaflets are distributeed to students.

		STEP 4 The teacher presents a funny video to students about Internet safety. The video is available on YouTube: https://bit.ly/3v0tweZ STEP 5 The teacher using the interactive whiteboard Miro attempts in close collaboration with students to find out and outline useful internet safety tips. Focus on the following essential rules: • Check your privacy settings • Posting is permanent • Create strong passwords • Learn how to block or report inappropriate content • Never reveal personal and financial information • Be polite and respectful to others

		• Be polite and respectful to others • Always log out from personal accounts – especially when using public Wi-Fi networks • Respect age requirements of social media networks and websites to avoid being exposed to harmful and misleading content STEP 6 The teacher introduces to students the relationship between digital literacy and digital citizenship. Why being digitally educated is essential in every today global citizen? STEP 7 The teacher introduces to students the 9 Keys of Digital Citizenship by presenting them the following proposed video, which is available on YouTube: • https://bit.ly/3MbM55q STEP 8 The teacher poses some questions to students about Internet safety with the aim to spark conversation and test what they have learnt so far. The following questions are proposed: • What should you do if a stranger asks you to send a picture of yourself to them? • Who should you accept friend requests from online? • If you post something on the internet, who may be able to see it? • Someone in your class has sent around an embarrassing photo of another classmate. What should you do with it? • One of your friends has posted a video of you on the internet and you don't like it. You've asked them to take it down but they've said no because it's funny. What should you do? • A classmate tells you that somebody has been calling him mean names on an online game. What should you do? • You need to create a password for a website. What should you use? • Who can you share your passwords with?
	LESSON 3 – "Fake" News	STEP 1 The teacher opens the lesson by asking the students how do they get their news (e.g., from social media, tv etc.) STEP 2 The teacher shows to students the following video under the title "Fake news stories thriving on social media", available on CNN website (https://cnn.it/3KTQnhH).

		STEP 3 The teacher poses the following questions to the classroom to spark conversation: Why do you think some people share fake news stories? What is the potential problem with fake news? **STEP 4** After the discussion, the teacher tells to students that there are many ways for evaluating information in terms of accuracy and credibility, such as: look at the source of the information (author, publisher) look at the purpose of the story look at the story's objectivity and accuracy look at the reliability and credibility of sources **STEP 5** The teacher organizes students into groups of four or six. **STEP 6** The teacher assigns each group a website, requesting them to navigate it. The teacher chooses a website with unreliable content. You can find some of those websites online at the following link: https://sites.google.com/site/trolledhelpline/non-credible-websites **STEP 7** The teacher distributes to students a handout and gives them time to fill in it.

		STEP 8 As a final stage, the teacher poses some questions to open up the discussion among students. The following questions are proposed: • What conclusions did you draw about the given website using only your knowledge and experience? • Compare and contrast how did you use to evaluate websites with the way you evaluted the given website today. How do they differ?

PART 4. OF SCENARIO

BENEFITS	When students are truly digitally literate, they are critical viewers. Literate students learn to evaluate and question their sources, think critically, use technology safely, responsibly, and effectively. With the increased use of digital resources and the rapid digital transformation after the COVID-19 pandemic, students need to acquire all essential skills in order to interact with the digital today world effectively. The benefits for a student being digitally literate are plenty and unquestionable. The following advantages have been identified and presented as follows: • better decisions: digital literacy allows students to search, study, analyze and compare everything at any time • increase creative thinking: digital literacy allows students to think out of the box, think creatively, particularly when they are requested to create digital content • save time: being digital literate can save hours for school research projects that could only be done offline in the past (e.g., in the past, students used to go to libraries to search and find information about school projects they used to undertake. Nowadays, the Internet offers a vast amount of information significantly reducing the searching time. More benefits are presented in the learning outcomes' section.
RISKS AND SUGGESTED SOLUTIONS	Teaching digital literacy, apart from empowering students with all essential skills need in today's digital society, it can also hide risks that should be identified prior to the beginning of the lessons. Below, a number of potential risks that might affect the smooth flow of the lessons are presented: • poor collaboration between students • hesitation to talk about personal opinions with regards to the discussed topic • limited ability to obtain and understand basic concepts and terms • less "critical thinking" • students may know more than teachers (we should take into consideration that children from an early age are getting exposed to technology. How many times have we seen children of preschool age play games on tablets or watch animated videos?)

	In order to manage the above possible risks, some suggested solutions follow: • emphasizing the important values of team building and teamwork • constantly encouraging students to talk about technology and express their personal points of views. Listening carefully without interrupting them • adapting the teaching methods to students' special needs. Not all students have the same familiarity with technology its basic terms and concepts. The lessons should be flexible and teachers proactive to address all students' levels of knowledge and understanding • teachers should encourage students to share their knowledge with them. Don't forget that learning is a win-to-win process!

LAND ART

PART 1. OF SCENARIO

TITLE	**Land Art**
MAIN SUBJECT	**ARTS**
OTHER SUBJECTS/DISCIPLINES	Physical Education – Biology or Forest and Nature Conservation Institute (FNCI) - ICT
TYPE	*larger educational project and nature hike*
DURATION OF CLASSES	*Number of lessons: 3x90m + hike*
AGE OF STUDENTS	**15 – 18**

PART 2. OF SCENARIO

AIM OF CLASSES		Centred on a hiking trip and profiting from the benefits of close contact with Nature, this scenario aims at developing in students a harmonious relation with the natural environment, themselves, and their community by: • raising the students' awareness of the importance of self-care (through leisure, physical activity, and nutrition) • fostering the students' imagination and creativity • engaging them in the environmental preservation of their natural environment • sharing their experience and knowledge with the school and wider community
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	**Students are expected:** • To understand the concepts of plane, rhythm, space, structure, light-color, framing, among others - in different contexts and expressive modalities • To articulate concepts (space, volume, color, light, movement, structure, form, rhythm), references, experiences, materials and supports in plastic compositions • To use fitness apps for research and video-editing software • To become familiar with a healthier lifestyle • To identify and understand the importance of conservation of endemic species of fauna and flora

	IN THE FIELD OF SKILLS	• To develop artistic expressiveness and art competences • To develop creativity, critical and divergent thinking • To develop organizational skills • To organize exhibitions in different formats – physical and digital • To identify endemic species of fauna and flora and issues related to their conservation • To understand the importance of outdoor physical activity
	IN THE FIELD OF SOCIAL COMPETENCES	• To promote group/teamwork and social interaction • To strengthen emotional bonds and class cohesion • To use online and physical tools to interact with the local community and convey specific messages • To raise environmental/social awareness and responsibility
TEACHING METHODS	Learn-by-doing, nature hike, experiential learning, brainstorming, teamwork, buzz groups.	
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Worksheets Bags Mobile phone Internet Fitness app (MyFitnessPal) Computers Video and photography-editing software	
PRELIMINARY CONDITIONS (if applicable)	*The students should be familiar with the basic rules of pedestrianism.*	
TIPS / METHODOLOGICAL REMARKS	A hiking trip is a perfect opportunity for interdisciplinary work. The subjects suggested in this scenario are but one possible configuration. Resorting to the educational services of an environmental protection entity can be replaced by a natural sciences/biology teacher. The final project of this learning scenario – an awareness video – can be disseminated outside the school's media and website, to provide students with a different context, a wider audience and added responsibility.	

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARAC-TERISTICS	**Physical Education** Relating wellness and health to nutrition and physical condition Identifying types of physical activity and issues that potentially limit/prevent them (sedentary lifestyle and technological development) **Arts** Combining different concepts and visual elements (form, space, balance, texture) into a plastic composition Selecting and experimenting with natural elements Getting familiar with photography planes **ICT** Getting acquainted with/using image-processing software **Biology** Sharing knowledge and relevant issues/problems concerning endemic species and their conservation	
BASIC TERMS	Well-being - nutrition- hiking – land art – endemism - fitness - conservation	
STRUC-TURE	PHYSICAL EDUCATION LESSON 1	**Before class:** Students are asked to bring food/drink (or their labels) that people commonly take for a day out, hiking or on any other outdoor activity. **In class:** STEP 1 –Students form groups of 3-4 by choosing a card, illustrated with different foods. The students who get the same food integrate the same group. STEP 2 – Groups brainstorm and analyse the nutritional values of foods/drinks/labels they brought. Students may also use the internet and/or an app (MyFitnessPal, for example). STEP 3 – Students are asked to note down their findings in worksheet A. STEP 4 – Groups brainstorm alternative and healthier options to integrate their lunch box. STEP 5 – Students research information about their nutritional value and fill in worksheet B (resorting to the internet, apps or equivalent). STEP 5 - Students compare the values registered in their worksheets and decide on which are the healthiest options. STEP 6 – Students are asked to bring as many healthy options as possible for a shared meal during the hiking trip they are going on.

	Hiking	**BEFORE THE HIKE** **Physical Education:** Students check they have the equipment needed for the hike (comfortable hiking shoes, lunch box, and proper clothing for current weather). **Art:** STEP 1 – Students are asked to collect organic elements (branches, sticks, leaves, rocks, ...) in a bag for a land art installation that will be made at the end of the walk. Students are also encouraged to make videos and take photographs during the hike to include in the final project. **DURING THE HIKE** **Forest and Nature Conservation Institute (FNCI):** The representative of the FNCI presents students with information about the endemic species of fauna and flora found on the route and about the importance and the challenges of environmental preservation. Students are encouraged to note down relevant information about endemic species, for their final project. **Physical Education:** Students and teachers sit on the ground, in a circle, share the healthy food/drink they brought and discuss their choices. **AT THE END OF THE HIKE:** **Art:** STEP 1 – Students organize themselves into groups of three elements and gather the organic elements collected along the way. STEP 2 – Each group chooses a place to carry out their art installation, such as a tree, the ground, a rock, a watercourse. STEP 3 – Students form the art installation with the collected elements, bearing in mind visual balance, placement of different textures and elements. STEP 4 – Each group photographs their work with the mobile phone respecting the three picture planes: in detail (close-up), overall (including only the installation) and panoramic (the installation and the surrounding environment)
	ICT/Art LESSON 2 and 3	**In class:** STEP 1 – Students are asked to put together a video aiming at raising their communities' awareness of the importance of recognising and conserving the natural environment, especially endemic species. The video may include the images captured during the hike, the information learnt about endemic species, and their land art experience. Students may also add any comments they wish and are encouraged to be creative. The videos should not be longer than 2 minutes. STEP 2 – The presentations are to be posted in the school's social media, website and newsletter.

PART 4. OF SCENARIO

RISKS AND SUGGESTED SOLUTIONS	The students are not familiar with the basic rules of pedestrianism – watch PowerPoint presentation here The students are not familiar with video-editing software – allow some time for getting acquainted with it or take that into consideration when forming groups The Forest and Nature Conservation Institute (FNCI) is not available – invite a natural sciences/biology teacher instead.

ART BASED TEACHING

PART 1. OF SCENARIO

TITLE	**Art Based Teaching**
MAIN SUBJECT	**Art**
OTHER SUBJECTS/DISCIPLINES	History, Geography, Literature, Foreign Language
TYPE	*larger educational project/study visit*
DURATION OF CLASSES	Scenario for 4 lessons – 45 minutes*4
AGE OF STUDENTS	**15-16**

PART 2. OF SCENARIO

AIM OF CLASSES		• To introduce art based learning methods. • To explain how classical disciplines might be learnt in an enjoyable way. • To develop students 21st century skills involving a variety of art forms and aesthetic elements in an interdisciplinary learning environment. • To understand how paintings and drawings help convey significant ideas and events, and how people today understand the past from putting together stories and history from these images. • To analyze and organize a series of images in a way similar to that of putting together words to form a play script and gain knowledge about the past. • To engage students in such creative activities that enable student teachers to think, plan and teach towards understanding across and beyond the curriculum. • To develop a dynamic and diverse culture in the classroom through creative and inclusive processes.
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • Improve art competences • Find and identify attitudes, emotions, viewpoints and intentions of cave arts and so the history. • Expand their vocabulary (art, feelings, different disciplines like history, geography...) • Readthe history from cave arts andtry to understand and interpret the information in today's world. • Relate different disciplines to learn more

	IN THE FIELD OF SKILLS	Students can: • Perceive new and creative solutions to solve problems • Become aware of "others" in a more multi-dimensional way • Access and analyze information • Feed his curiosity and imagination by doing google searches • Learn how to use new digital tools and separate among them; for what aim or activity to use them • Improve their verbal and linguistic ability and creativity • Focus on historical information through the first art technique; cave paintings.
	IN THE FIELD OF SOCIAL COMPETENCES	Students can: • Write and communicate effectively • Experience the complexities of real-life scenarios in a safe environment and creative learning setting. • Collaborate with his friends within teams and feel relaxed and more confident. • Gain confidence and express a desire to take risks in their future practice.
TEACHING METHODS	Experiential learning: learning by doing Collaborative Learning: a strong focus on group work. Student Centered Learning: students and their needs are at the center of the learning process. Art-based techniques (Interactive Theatre/role-playing, guest speaker, the six-word-story, drawing). Outdoor Education: learning outside of the school building in the "real" environment	
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	Platforms and tools: Mentimeter, Canva, autodraw, Computer or mobile phone, internet connection, a setting to display theatrical play, some costumes, papers, pencils	
PRELIMINARY CONDITIONS (if applicable)	*A performance corner or studio might be arranged beforehand. Students might be asked to bring some costumes according to the play plot in their minds.*	

TIPS / METHODO-LOGICAL REMARKS	How do arts affect the educational process of the learner? Arts experiences **boost critical thinking, teaching students to take the time to be more careful and thorough in how they observe the world**. The arts provide challenges for learners at all levels. Art education connects students with their own culture as well as with the wider world. By learning more about the Arts which are important disciplines in themselves, but students will also meet combined Arts which offer them inspiring entry points to understanding other subjects.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARAC-TERISTICS	**History**: Learning about paleolithic Age and cave paintings, what they show and how they were made. **Geography**: Detecting geographical features of a place from the cave paintings, being able to commenting on them and learning some words and expressions from geography **Literature**: Learning expressing feelings and thoughts in six words will force students to choose vital points wisely. **Art**: Writing a play script,acting in a play, writing stories, drawing pictures or creating infographics will let students understand the effectiveness of art in learning.	
BASIC TERMS	Art-based methods, history, geography,	
STRUC-TURE	LESSON 1	**STEP 1 (35')Introduction** Guiding questions: • How do people express ideas through art? • Why do people use images to communicate? • How has art been used throughout history to tell stories or to show us what people in other times and places considered important? Students learn **the Paleolithic Age** from cave paintings. Teacher presents a video about the topic. https://youtu.be/sZCkoMoySes (2.30') Students think about and answer the qestions asked by the teacher. Then they draw pictures similiar to the ones in caves on https://www.autodraw.com/ Others try to guess what their friend is drawing. **STEP 2 (10')Reflections** Then the teacher gives some time to have a google search about living conditions in **the Paleolithic Age**, meaning cave paintings. They also talk about the feelings and expectations of ancient people living in that era. Teacher tells students that they will create and play a theatrical play covering lifestyle in the paleolithic age in the next lesson. So they may have taken some costumes with themselves.

	LESSON 2	**STEP 1 (40')Acting Time** **Using interactive theater as a blend of education and entertainment often called "edutainment".** **Teacher lets students watch a video of National Geographic.** https://youtu.be/ZjejoT1qF0c **(3.18')** Then students write some scripts of a theatrical play to answer the questions below Annex 1 and the ones in the first video.They create the words themselves. Students may work in groups. A performance corner might be designed in the classroom by teachers and students. While one group is performing their play the audience are free to take part to express their ideas. **STEP 2 (5') Reflections** All students will be invited to www.mentimeter.com to express their thoughts about what they learnt and what would you like to learn more about **the Paleolithic Age**.
	LESSON 3	**STEP 1 (25')Guest Speaker** The First Step of Art's Journey: CAVE PICTURES Guest Speaker: An artist Inviting an artist to the school or visiting him in an art gallery. The artist may explain students artistic features of cave works, art history, the tools used and the connections with modern art (Prehistoric cave paintings and ancient graffiti). Present and share annex 2 with students. **STEP 2 (20') Creating Infographic** Guest speakers and teacher may ask students to design an infographic on www.canva.com if there is a computer laboratory or by drawing on papers. They may use the timeline on annex 2 to design an infographic and create their own cave drawings according to the periods. They can also cover the replies to the questions on annex 1.
	LESSON 4	**STEP 1 (30')Outdoor Lesson** The next lesson will be at an archeological site to see the cave paintings to examine geographical features of the site. For ex: If animals living at that time are depicted, information about the climate can be obtained. For example, if there is an elephant picture on the wall, it is raining. It can be said that there must be a rainy climate with trees and meadows. If the image indicates the presence of a crocodile, it can be said that there must be a stream or a freshwater lake. If a pet is depicted, for example, a cow ; it can be said that there must be a non-arid climate where cattle breeding is done. (Geography teacher may be involved in this lesson)

		By using this information, students will examine the site. During the excursion, students gather the fossils or nummulites to ornament the photo frames that will be given by the teacher. And then paint and design their frames to keep as a reminder of this lesson. **STEP 2 (15')The Six Word Story** The Six Word Story: Teachers from all branches can use this technique. Story-telling has long been a way of oral teaching in many cultures. The teaching approach "the six word story" asks for telling a story only in six words. Teacher asks students to convey any course related to cave paintings, history or the Paleolithic Age in a six word sentence. For example, **the best communication via cave pictures.** They can write their six word story on www.flamingtext.com and download to share with each other. See sample one in Annex 3.

PART 4. OF SCENARIO

RISKS	Students may not be reluctant to act out the play during lesson 2.
AND SUGGESTED SOLUTIONS	Volunteer students might act first to let the others feel relaxed.

ANNEX 1:

WHILE TEACHING PURE, THE STUDENTS MOSTLY WILL BE LEFT ASKING "WHAT IS IT FOR? WHAT DOES IT MEAN?" ROLE-PLAYING ENABLES THEM TO START ANSWERING THESE QUESTIONS AND TO START EXPANDING THEM.

WHILE WRITING PLAY SCRIPTS PLEASE TRY TO ANSWER THE QUESTIONS BELOW:

"WHAT DOES IT MEAN TO BE A CAVEMAN LIVING 12,000 YEARS AGO"

„HOW WOULD SOCIAL LIFE BE?"

„HOW WOULD YOU MAKE YOUR LIVING?"

„WHAT WOULD YOU DO DURING COLD WINTER DAYS?"

„HOW WOULD YOU PROTECT YOURSELF IN HAZARDOUS CASES?"

„HOW WOULD YOU COMMUNICATE?"

„WHAT IF YOU HAD HEALTH PROBLEMS? WHAT KIND OF NATURAL SOLUTIONS WOULD YOU LOOK FOR?"

„TO DISCOVER NEW SETTLEMENTS, WHAT KIND OF PRECAUTIONS WOULD YOU TAKE?"

„COMPARING TODAY'S WORLD, WOULD IT BE ENOUGH FOR YOU TO ONLY SURVIVE AND NOT HAVE A COLORFUL LIFE LIKE NOW?"

INFORMATION, ALONE, RARELY MAKES PEOPLE CHANGE THEIR MINDS, BUT PERSONAL EXPERIENCE OFTEN DOES.

ANNEX 2:

INTRODUCTION TO CAVE ART

SOURCE: © HERITAGE IMAGE PARTNERSHIP LTD / ALAMY

- DESCRIBE WHAT YOU SEE.
- WHAT DO YOU THINK IT WAS PAINTED ON?
- HOW OLD DO YOU THINK IT IS?
- WHY DO YOU THINK IT WAS DRAWN AND PAINTED?

WE CALL THIS CAVE ART. IT WAS PAINTED ON THE WALLS OF CAVES IN EUROPE AND IN ASIA DURING THE PALAEOLITHIC PERIOD SOME 325 MILLION TO 10,000 YEARS AGO. TO MAKE IT EASIER TO TALK ABOUT EVENTS THE PERIOD IS BROKEN UP INTO THREE PERIODS.

TABLE 1: TIMELINE OF PALAEOLITHIC PERIOD FROM 325 MILLION TO 10,000 YEARS AGO.

YEARS AGO	PERIOD	PEOPLE	IMAGE OF CULTURE
3,500 30,000	Upper Palaeolithic	Homo sapiens Cave art with animals appears	 © Giovanni Caselli
30,000 35,000	Transition Middle to Upper Palaeolithic	Homo sapiens spread across Europe Homo neanderthalensis have disappeared	 Courtesy of NASA/JPL-Caltech
300,000 1.6 million 1.9 million 2.3 million 3.4 million	Lower Palaeolithic	Hand axes appear Homo erectus (Africa) Homo habilus (Africa)	 By T. Goskar and K. Nichols, copyright Wessex Archaeology

The Upper Palaeolithic Period is very different from the Middle and Lower periods. People look different and the culture (ideas, customs, and social behaviour) of the people are different. Over the different periods humans were generally hunter-gathers who used tools and fire, and from the Lower period onwards they seem to have buried their dead.

Cave drawings are they art?

Weren't they used for teaching young hunters?

The word art does not appear before the 15th century so the Palaeolithic people did not know it as art. Using the word art from the 15th century means that the Egyptians, Greeks and Romans had no word for art.

Yet, art is more than a skill or technique. It has a purpose going beyond making something. Any connection with our modern use of the word art did not appear until the late 1600s.

So it is possible some of the pictures were used to teach young hunters but so many of them have other characteristics that mean there had to have been links with some belief system.

Annex 3:

References:

Dean, Colleen & Ebert, Christie & McGreevy-Nichols, Susan & Quinn, Betsy & Sabol, Robert & Schmid, Dale & Shauck, R. & Shuler, Scott. (2010). 21st Century Skills Map: The Arts

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Rao, U. (2005). Drama in Education. Himalaya Publishing House, Mumbai.

Royal Society of Chemistry , access: 15.09.2021: https://edu.rsc.org/resources/cave-art-history/1528.article

PART 1. OF SCENARIO

TITLE	**Being a wise consumer, consumer rights and responsibilities, dealing with consumer complaints**
MAIN SUBJECT	**Business**
OTHER SUBJECTS/DISCIPLINES	**Business, Home Economics, and English.**
TYPE	*Unit of Learning (5-6 Lessons)*
DURATION OF CLASSES	58 mins
AGE OF STUDENTS	**12-14**

PART 2. OF SCENARIO

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	Students can: • The definition of a consumer. • Brands and important factors to consider when choosing a brand.' • Falsy economy defined. • Sale of Goods and Supply of Services Act 1980. • Consumer Protection Act 2007. • Solutions and remedies for consumer problems. • Responsibilities of retailers under consumer legislation. • Being a responsible consumer. • Understanding consumer agencies and institutions: • The importance of sustainable consumption. • The importance of ethical behavior. • The importance of ethical consumption. • Business ethics and social responsibilities. • Sources of consumer information. • When a complaint is justifiable or not. • How to communicate effectively. • Develop greater awareness of language use, both in the Media industry and for communication purposes. • How to complain correctly in person. • How to write a letter/email of complaint.

	IN THE FIELD OF SKILLS	• Communicating: We listen and express ourselves when we engage with various organisations that can help with our consumer problems. • Communicating: We listen and express ourselves when we discuss our consumer rights in a particular situation. • Managing myself: We use digital technologies to manage ourselves when we check the websites of consumer agencies and financial institutions. • Staying well: We are being responsible, safe and ethical in using digital technology when we shop online. • Being Creative: Exploring options and alternatives when shopping for fresh and convenient foods. • Developing personal point of view and self expression. • Being curious: Gathering, recording, organising and evaluating information and data. • Thinking creatively and critically. • Reflecting on and evaluating learning. • Development of language skills. • Using digital technology to access, manage and share content.
	IN THE FIELD OF SOCIAL COMPETENCES	• Being aware of our rights as consumers and the responsibilities of the retailers who sell goods and services. • Appreciating how we can be a responsible consumer. • Making responsible choices when purchasing goods and services. • Appreciating the benefits and dangers of online shopping. • Developing awareness of the Media Industry – methods used to entice consumers, bias etc. • Being aware of the organizations and agencies that can help consumers if they have a problem. • Promote decision making and student voice.
TEACHING METHODS	• Student centered – build on their own experiences and discovery approach. • Multi media approach – strong use of I.C.T., e.g. mobile phones, YouTube clips, social media which this age group are familiar with e.g. Tik Tok. • Discussion based – Arrange students into pairs/ groups. Students discuss their own experiences of consumer problems, either involving themselves or members of their family. • Scaffolding and differentiation – Share one example with class. adapt material according to student ability and learning needs. • Challenge the students to come up with a list of consumer rights when buying goods or services and get them to check this against their learning in this chapter. Examples may include: quality of the product, description of the product, prices, sales and services • Students discuss their own experience of online shopping.	

	• Organize use of ICT for students to explore online shopping and return policies. • Organize a role play session around consumer case studies. Include small claims court. • Invite managers from local businesses to visit class to speak about consumer experiences and approach for dealing with customer complaints
SUGGESTED TEACHING TOOLS/ MATERIALS NEEDED	• Relevant textbooks and websites online. • Digital devices, e.g. chromebooks, mobile phones etc. • Colorful chart paper for group work. • Pens, paper, markers. • Whiteboard and projector. • Mini whiteboards.
PRELIMINARY CONDITIONS (if applicable)	*Are there any conditions that must be fulfilled so that students can effectively participate in the classes (e.g. they must have completed a course on some specific subject, they must play some instruments etc.)*
TIPS / METHODOLOGICAL REMARKS	**Useful links:** *https://www.youtube.com/watch?v=0AiP5LJi4cs* *https://www.youtube.com/watch?v=sm-f8VvKwjw* *https://www.youtube.com/watch?v=4FyrvbQ8TaU* *https://www.youtube.com/watch?v=DTQxc1-tiF4* *https://www.youtube.com/watch?v=zHRVpyI2UWw* *https://jamboard.google.com/* *https://create.kahoot.it/details/de70123f-69e5-4d7a-91db-1cbc2dff0a4e* *https://www.youtube.com/watch?v=qPf9EUPxk0Q* *https://www.ccpc.ie/consumers/* *https://www.safefood.net/education/labels* *https://thegoodshoppingguide.com/* *https://www.youtube.com/playlist?list=PL3nsxqvwCTUHs-B003V6I9h_eoGa21zEi*

	https://www.youtube.com/watch?v=d4JspSj2En4 https://www.menti.com/h74a2d4ku5 https://moneymatters.ccpc.ie/wp-content/uploads/2019/08/S4-Lesson2-Activity1-teacherresourceshet-InformedConsumerRightsQuiz-2.pdf https://www.jct.ie/perch/resources/business/resource-booklet-day-2.pdf https://www.scoilnet.ie/uploads/resources/19511/19234.pdf https://docs.google.com/presentation/d/1CixX840zWRJtZajhrDFZdLfv5KJ4XDKrL4snGv4NRq1/edit?usp=sharing https://www.blooket.com/dashboard https://mrryanjcb.weebly.com/lo-17---business-postcard.html https://www.brainscape.com/flashcards/consumer-key-terms-5588757/packs/8458542 https://www.youtube.com/watch?v=-ewhN-hwhas

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARAC-TERISTICS	• A differentiated approach. • Scaffolding, build on what students already know, their own experiences. • Cater for different learning styles, evident in different pedagogical approaches. This includes: kinesthetic, visual, auditory, verbal, interpersonal and intrapersonal learning styles.
BASIC TERMS	• Consumer • Good • Service • Needs • Want • Legislation • Consumer behavior, • Consumer attitudes. • Consumer perceptions. • Consumer culture. • Consumer motivation. • Consumer purchase decisions. • Consumer buying decision-making. • Consumer consumption. • Unit price

BASIC TERMS	• Impulse buy • Right • Responsibility • Ethical behaviour • Loss leader • Advertising • Marketing • False economies • Refund • Repair • Replace • Ombudsman • Merchandising technique • Nutritional label	
STRUC-TURE	LESSON 1	**Plenary lesson- understanding what prior knowledge students have**. What is a consumer? Being an informed consumer. **STEP 1** **Teaching strategy: Collaborative interactive brainstorming session on Jam Board**. Students can add images, sounds or words they associate with the consumer. **Step 2** **Teaching strategy: Think, Pair Share activity** - students are encouraged to think about being a consumer, identify consumer problems and how consumers are protected. **Step 3** **Teaching strategy: Discussion** Guidelines for being a wise consumer, e.g. do I need it, can I afford it, etc **Step 4** **Teaching strategy: teacher leads success criteria with visual digital aids.** Go through elements of being a wise consumer. Watch videos created by students. Answer questions attached. https://www.youtube.com/watch?v=-ewhN-hwhas **Step 5** **Teaching strategy: Interactive game** using random wheel spinner matching key words. Complete lesson with Blooket https://www.blooket.com/dashboard

	LESSON 2	**Lesson focus - Sale of Goods and Supply of Services Act 1980. Rights as a consumer. Focusing on the responsibilities of the retailer to include redress.** **Step 1** **Teaching strategy: case study with visual and written sources** which students may have found from previous homework. Dealing with complaints- case study from consumer magazine of identifying consumer complaints. **Step 2** **Teaching strategy: audio visual clip and students use note making skills to record thoughts.** Video explaining 3 Rs of redress- students take notes from the video. **Step 3-** **Teaching strategy: Assigned group work for role play.** Students are in groups of 3 for role play activity- roles assigned are the writer, the consumer and the retailer. In each group, the writer prepares the script and the consumer and retailer role play to the class. **Step 4-** **Teaching strategy: Individual student written response.** Complete business postcard- students write down 2 new pieces of information they learned and 1 element they would like to know more about.https://mrryanjcb.weebly.com/lo-17---business-postcard.html
	Lesson 3	**Lesson focus - Letter of complaint (format) and Review of Consumers' Rights, Responsibilities** **Step 1:** **Teaching strategy: learning aimsand learning outcomes shared.Pair work to complete game of kahoot.**Success criteria and lesson focus on Google slides on the whiteboard. Shared also on Google classroom for students to view on their mobile phone.Students note learning aims to self assess during class with regular "check ins." Allow into pairs and to complete the starter/ warm up game of kahoot.Game of kahoot focuses on key terms and elements required for a letter of complaint and revises consumer rights.Encourage use of a business alias name instead of own student name. H.W. pass for first place winning pair/ chocolate bar to encourage a positive atmosphere.

Step 2:

Teaching strategy (Instructional leadership): Think pair share discussion and class graffiti (establish success criteria for letter). Students "check in" with a partner next to them, must find in their textbook 5 key elements to include for writing a letter of complaint. One student from each pair will be asked to share feedback with class, the other partner will add to graffiti on board. To differentiate and encourage student accountability approach e.g. "the student who is the youngest in the pair," or "the student who is most tired today," "the student who is wearing the most colorful socks" etc (Instructional Leadership approach). Class graffiti becomes success criteria on the whiteboard - students use markers, photos taken and uploaded onto Google classroom.

Step 3:

Teaching Strategy: Audio visual clip, written examples in textbook and note making. Students view clips from Youtube and add notes to brainstorm for creation of their own letter of complaint. Read 2 different examples in their textbook. Once read in pairs add to add their own brainstorm notes.

Step 4:

Group work and place mat response (instructional leadership).

Teacher check in - thumbs up, thumbs down. Numbered heads, arrange students into groups. In groups complete placemat activity. Students come up with team names. Facilitation of the sharing of new information as students have moved seats and are working with different students. Each student has an assigned section of their placemat, where they write 5 pieces of information to put into their letter of complaint. Time assigned and music in background. When music stops each group must discuss their ideas and identify in each section of place mat overlapping/ different ideas. Lastly agree on 4 key points to put into the center of their placemat.Can facilitate rotation, where one student from each group travels to another group to get new information and returns to the initial start group. Place mats hung on the classroom wall for the next lesson.

https://www.ccpc.ie/consumers/how-to-complain/complaint-letter-templates/#poor

Consumer Legislation (role play) See letter of consumer complaint in Consumer Folder- For part of lesson 2

	LESSON 4	**Lesson focus - Letter of complaint creation and write up.** **Step 1:** **Teaching strategy: learning aimsand learning outcomes shared.AFL approach and Instructional Leadership.** Success criteria and lesson focus on Google slides on the whiteboard.Shared also on Google classroom for students to view on their mobile phone. Students note learning aims to self assess during class with regular "check ins." For starter activity Rapid writing - on recycled A4 paper students have 4 minutes to write/ draw as much as they can recall about writing a letter of complaint and consumer rights. Once time is up students turn their page into a paper plane with a name.Then instruct to line up at opposite sides of the classroom, countdown and throw planes. Each student picks up a different plane to assess what is written on the page. Quick discussion and feedback. **Step 2:** **Teaching strategy: students write their letter of complaint using I.C.T. skills on school chromebooks.** Promote independent learning and use of scaffolding. Students have access to their placemats. paper planes, Google classroom notes to create their letter of complaint. Key word charts and posters for writing skills in the classroom. **Step 3:** **AFL - Peer assessment and class discussion: students email their work to a fellow student and share feedback.** **WWW and EBI, must send back one what went well and one even better if. Teacher shares some student examples on board.** **Teacher shares some student examples on board.** **Step 4:** **Teaching strategy: plenary and review.**Mentimeter feedback - students share what they have learned for consumer rights and customer complaints.

	Lesson 5	**Lesson focus – Application of consumer skills and prior learning of nutritional knowledge when food shopping.** **Step 1:** **Teaching strategy: mentimeter AFL survey and class discussion.** Students will use mentimeter to explore what needs to be considered when shopping for food. Class discussion will follow and the teacher will elaborate on any parts that were missed. **Step 2:** **Teaching strategy – Tiktok and student interpretation.** Students will create a Tik Tok with a partner on the guidelines that should be followed before going food shopping. E.g. Planning meals, making a shopping list, cross checking with foods that you already have at home etc **Step 3:** **Teaching strategy: I.C.T (mobile phones/ device).** Students will create a meal plan for a family of four for a week. They will use a local supermarket's online store to stick to a budget of €100. This will give teachers an opportunity to teach about 'own brand' products, loss leaders, merchandising techniques etc. **Step 4:** **Teaching strategy: Group work and class discussion.** Teacher will hand out laminated food labels that students would be used to seeing in supermarkets. Students will analyze their labels and then feed back to the class on whether they think it is nutritious or not. Students will also compare commercial products to homemade products.

PART 4. OF SCENARIO

BENEFITS	Interactive, fun, real life examples examined, communication and listening skills used, ICT skills used, students are able to fully engage with the content.
RISKS AND SUGGESTED SOLUTIONS	**Risk 1:** Lack of internet may inhibit interactive work. **Solution 1:** Therefore book school digital devices in advance. e.g. chromebook or computer room. **Risk 2:** Lack of ICT skills may deter students from completing work online or engaging with digital elements of learning.

RISKS AND SUGGESTED SOLUTIONS	**Solution 2**: Subtitles to be used for video for international students. Differentiated worksheets for students with additional learning needs Develop cross curricular links with I.C.T. and other subjects that promote I.C.T. skills. **Risk 3**: Covid restrictions may prevent visits of external guest speakers. Solution: Use Google Meets/ Zoom to have speaker host online. **Risk 4**: Covid restrictions (social distancing) may prevent group work indoors/ classroom. **Solution**: Shorten group work to 5 minutes and facilitate pair work instead at intermittent periods. If school facilities allow – use external space outdoors and bigger classroom space such as the school library.

THE HOUSEHOLD BUDGET

PART 1. OF SCENARIO

TITLE	**The Household Budget**
MAIN SUBJECT	**Business**
OTHER SUBJECTS/DISCIPLINES	Home Economics, maths
TYPE	*1 hour*
DURATION OF CLASSES	1
AGE OF STUDENTS	**13-14**

PART 2. OF SCENARIO

AIM OF CLASSES		Prepare and analyse a budget, determine the financial position, recommend appropriate action and present the analysis in tabular and graphic formats.
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	In this section students will gain an understanding of individual and household budgets
	IN THE FIELD OF SKILLS	How to prepare and evaluate one including calculating totals and determining the financial position of the budget.
	IN THE FIELD OF SOCIAL COMPETENCES	Life skills for students to be able to budget as young adults to avoid financial debt.

SUGGESTED TEACHING TOOLS/MATERIALS NEEDED	*Visualiser, Calculator*
PRELIMINARY CONDITIONS (if applicable)	*Students should have an understanding of the difference between needs and wants, the different forms of resources available to them as individuals and to a household and how individuals and households spend their income).*
TIPS / METHODOLOGICAL REMARKS	In this section students will gain an understanding of individual and household budgets and how to prepare and evaluate one including calculating totals and determining the financial position of the budget.

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	• What is a budget? • The value of budgeting • Preparing a budget including format and layout • Evaluating a budget	
BASIC TERMS	Budget, income, expenditure, net cash, closing cash, opening cash, regular expenditure, irregular expenditure, discretionary	
STRUCTURE	LESSON 1	**Activity 1** In this activity students will learn what a budget is and why making one is important. A budget is simply a plan of expected future income and expenditure and making a budget can help us to get what we need and want in life. **Think-Pair-Share** Step 1. Explain to the class that they are going to do an activity where students will think about and discuss their understanding of the word 'budget'.

STRUC-TURE	LESSON 1	Step 2. Distribute one of the worksheets below to each student and invite students to complete it individually. Depending on the class you may decide to do the first part of the worksheet (what does the word 'budget' mean?) as whole class activity. Step 3. Discussion- Teacher could begin by asking students if they have ever heard this word before and if so in what context (e.g. government budget, household budget etc.). Ask if students in the class ever sat down and came up with a plan about how to save or spend their money, e.g. to buy Christmas presents or for a holiday? Explain all budgets (inclusive of personal budgets, household budgets, business budgets or Government department budgets) are a way of: • keeping track of everything that is coming in and going out. • planning how money is spent. • helping to develop an awareness of money and how it is used in order to make planning for the future easier. • keeping spending under control. Step 4. Ask students to form pairs, compare their work and decide which answers are the best for each of the boxes on their completed worksheets. Step 5. Invite feedback from a sample of pairs, recording student responses on the white/blackboard. **Student Worksheet: Think, Pair, Share** When this activity is completed provide feedback by facilitating a classroom discussion to identify the student's answers and assess the factors that influenced their decisions. **Activity 2** Step 1: In the worksheet below we are going to complete the Kerrigan household budget. We will assume they have €300 in cash at the beginning of January. Take this opportunity to facilitate a whole class discussion and ask the students to consider where this money may have come from. Step 2: Also discuss and illustrate the calculation of Net Cash, Opening Cash and Closing Cash figures with the students and ask them to determine the financial position of the budget (i.e. is it balanced, in surplus or in deficit?). **Student Worksheet: Kerrigan Household Budget**

		Possible Assessment Watch this clip from episode 1 of the CCPC sponsored TV show 'How to be Good with Money' and get the students to examine how planning a weekly shop helps with budgeting and ask them to consider what other impacts it might have. Ask the students to prepare a poster to represent their understanding of successful management of financial resources and this could be expanded to include an element of shopping ethically. **Activity 3: Household Budget Sample Question** **Step 1:** Below is a sample budget for the Weldon household for four months from September to December 2019. Ask the students to read and assess the information provided under the planned income and planned expenditure headings. **Step 2:** They should then complete the blank budget using all the figures provided. They should also explain the term 'Discretionary Expenditure'. **Student Worksheet: Weldon Household Budget** **Student Worksheet: Weldon Household Budget Solution**

PART 4. OF SCENARIO

BENEFITS	
RISKS AND SUGGESTED SOLUTIONS	**Discussion & Reflections** In the above we looked at budgeting for individuals and for households and analysed information and presented it in various formats. What surprised you when it came to completing a budget for a whole household? How does keeping a budget and planning your expenditure help to avoid impulse buying? We also completed a blank budget for the Weldon's and gave a detailed explanation of discretionary expenditure. What did you find most difficult when it came to completing this sample question?

HOW TO DESIGN A ROOM

PART 1. OF SCENARIO

TITLE	**How to design a room**
MAIN SUBJECT	**Home Economics**
OTHER SUBJECTS/DISCIPLINES	**Art**
TYPE	Unit of Learning (3 Lessons)
DURATION OF CLASSES	58 mins
AGE OF STUDENTS	**15-16**

PART 2. OF SCENARIO

LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• Define what interior design is. • Distinguish between your preferred and least preferred interior design styles. • Elaborate on the characteristics of good interior design. • Explain why a room needs to be attractive, functional, durable, safe and environmentally friendly. • Name and explain the design features needed for interior design. • Examine the impact that "Color" has on interior design. • Examine the impact that "Texture" has on interior design. • Examine the impact that "Line" has on interior design. • Examine the impact that "Shape" has on interior design. • Examine the impact that "Pattern" has on interior design. • Examine the impact that "Balance" has on interior design. • Examine the impact that "Emphasis" has on interior design. • Examine the impact that "Proportion" has on interior design. • Examine the impact that "Rhythm" has on interior design • Elaborate on how aspect affects decision making in interior design. • Explore how fixtures and fittings can be used to not only add functionality to a room but to also add personality and style. • Demonstrate how you would accommodate traffic flow in the room of your choice. • Appreciate how work sequence and ergonomics need to be taken into consideration when planning a room. • Investigate why a "work triangle" is important for functionality when planning a kitchen.

		• Create a kitchen using Ikea kitchen planner • Appreciate the principles of design in interior rooms. • Explore how you can make sustainable choices when planning to redesign a room.
	IN THE FIELD OF SKILLS	• Communicating: We listen and express ourselves when we discuss our personal tastes and preferences in relation to interior design. • Managing myself: We use digital technologies to manage ourselves when we research and shop for products online. • Financial literacy: We demonstrate financial literacy when we are able to compare prices of similar items online and stick to a budget. • Staying well: We are being responsible, safe and ethical in using digital technologywhen we shop online. • Being Creative: We demonstrate creativity when exploring options and alternatives when designing rooms and shopping for items in the room.
	IN THE FIELD OF SOCIAL COMPETENCES	• Appreciating how we can be responsible and sustainable when designing a room. • Making responsible choices when purchasing goods online for their bedroom. • Appreciating the benefits and dangers of online shopping. • Promote decision making and student voice.
TEACHING METHODS		• Student centered – build on their own experiences and discovery approach. • Multi media approach – strong use of I.C.T., e.g. mobile phones, YouTube clips, social media which this age group are familiar with e.g. Tik Tok. • Discussion based – Arrange students into pairs/ groups. Students discuss their own personal preferences when it comes to design styles. • Scaffolding and differentiation – Share one example with class. adapt material according to student ability and learning needs. • Students discuss their own experience of online shopping. • Organize use of ICT for students to design their dream kitchen Ikea kitchen planner and to shop for products online. • Creating mood boards for their dream college bedroom.
SUGGES-TED TEACHING TOOLS/ MATER-IALS NEEDED		• Relevant textbooks and websites online. • Digital devices, e.g. chromebooks, mobile phones etc. • Colorful chart paper for group work and moodboards. • Pens, paper, markers, scissors, glue. • Whiteboard and projector. • Graphic organisers

PRELIMINARY CONDITIONS (if applicable)	*Are there any conditions that must be fulfilled so that students can effectively participate in the classes (e.g. they must have completed a course on some specific subject, they must play some instruments etc.)*
TIPS / METHODOLOGICAL REMARKS	**Useful links:** *https://kitchen.planner.ikea.com/planner/#/ie/en/* *https://roomstyler.com/3dplanner* *https://www.youtube.com/watch?v=9CS6AL5Wptg* *https://www.youtube.com/watch?v=1Cp2UgRcZ1U* *https://www.pinterest.ie/bucwht/mood-board-bedroom/* *https://www.youtube.com/watch?v=xHGOZimYaU8* *https://www.youtube.com/watch?v=51rnmBLtKvs* *https://www.youtube.com/watch?v=24MCQAUnfm4* *https://www.facinghistory.org/sites/default/files/KWL_Chart_handout_v.final_.pdf* *https://www.pinterest.ie/the_avantgarde_/_saved/* *https://s3.amazonaws.com/prod-hmhco-vmg-craftcms-public/cluster-web-3.pdf* *https://www.online-stopwatch.com/rocket-timer/* *https://www.youtube.com/watch?v=CzG9s7yr1MA*

PART 3. OF SCENARIO

LEARNING CONTENT - DETAILED CHARACTERISTICS	• A differentiated approach. • Scaffolding, build on what students already know, their own experiences. • Cater for different learning styles, evident in different pedagogical approaches. This includes: kinesthetic, visual, auditory, verbal, interpersonal and intrapersonal learning styles.

BASIC TERMS	• Durable • Functional • Design features • Color • Texture • Line • Shape • Pattern • Balance • Emphasis • Proportion • Rhythm • Work sequence • Work triangle • Principles of design • Environmentally friendly	
STRUC-TURE	LESSON 1	**Plenary lesson- understanding what prior knowledge students have**. What is interior design? Characteristics of good design. **STEP 1** **Teaching strategy: KWL chart-** The lesson will begin with a KWL chart and students can write "interior design" on the top. The teacher will also put the chart on the board if the students are not used to this strategy. Students will list what they already know about interior design in the first column, what they want to know in the second column and at the end of the series of lessons they will complete the final section on what they have learned in the last column. (Here is an example of a KWL chart-link) **Step 2** Teaching strategy: Think, Pair Share activity - The teacher will open the lesson by showing students different interior design styles on Pinterest (link). The teacher will divide the class into pairs and ask the following questions. Students will think about their answers first, then share their answers with their partner and then feedback to a full class discussion. 1. Do you have a favorite room in your home? 2. Can you explain why this room appeals to you? 3. What colors do you like in room design? 4. What does texture mean? Can you describe some textures? 5. Suggest what points should have to be considered when redecorating a room. 6. Which Pinterest board style do you feel most drawn to? Why? 7. Is there any interior design style that you do not like?

		Step 3 **Teaching strategy: Graphic organiser and group work** The teacher will teach students about the characteristics of good design. All students will be divided into groups of 5 and each group will be given a graphic organiser. The teacher will display the 5 characteristics for good design on the board- attractive, functional, durable, safe and environmentally friendly. Each group will write a heading at the top of each circle. One circle will be left blank and students can discuss if they think a new characteristic should be added. The teacher will put a timer on the board and set it for 10 minutes. Each group will nominate one person to act as the scribe and another as a spokesperson. The other 3 people can use their phones to research why each characteristic is important in interior design. They will discuss everything as a group and form their own opinions before summarizing their findings on the graphic organizer. Step 4 **Presentation of information and class discussion**. When the timer goes off, the spokesperson for each group will come to the top of the classroom to present the findings of each group. If one group makes a good point that the other groups agree with then they can add it to their graphic organiser but it must be in a different colour pen. After all groups have presented their work, the teacher will also give feedback on the importance of each characteristic. **Step 5** **Note making:** In order to consolidate the learning at the end of the lesson, students will create their own notes in their copy on each of the 5 characteristics as well as their favourite and least favourite interior design styles. Students will also complete the final column in their KWL chart from the beginning of the class.
	LESSON 2	**Lesson focus - Features of design and design principles** **Step 1** **Teaching strategy: group work with laminated cards that have visual and written sources of information**. The teacher will divide the class into 4 groups. Each group will be given a laminated card that focuses on one of the five features of design- color, texture, line, shape and pattern. The card will have all of the key information on how each feature of design impacts on interior design. Students will be given 10 minutes in their group to go through the information on the card and to paraphrase it to each other so that they all understand it. They can use their phones to find additional information on how each feature of design impacts on a room.

	LESSON 2	**Step 2** **Teaching strategy: Padlet** The teacher will share a link to a blank padlet with students. It will be organised using the shelf layout. Each feature of design will be at the top of a shelf. Each person will contribute to the padlet by adding in key information about their feature of design. Students will be encouraged to add photos of positive and negative examples of each feature of design. The teacher will set a 10 minute timer for this also. **Step 3-** **Teaching strategy: Class discussion and note making from padlet** The teacher will discuss all of the contributions that are on the padlet. Students will give specific feedback and input on their contributions. All students will make notes in their copies based on the information from the padlet. **Step 4-** **Teaching strategy: visual stimulus and guessing game on powerpoint** The teacher will teach students about the 4 design principles by showing them a powerpoint. Students will research real examples of each design principle working and not working. Students will then paraphrase the key information into their own copies. **Step 5- Teaching strategy: twitter card** Each student will be given a twitter card. On their card they will have to tweet somebody and tell them something that they learned about today's lesson. They will also have to come up with a hashtag. All of these will be displayed on a board as they exit the classroom.
	LESSON 3	**Lesson focus - How to design a kitchen** **Step 1:** **Teaching strategy: creating a success criteria** Students will take all of the information that they have learned over the last two classes and together as a class, they will co-create a criteria of what is needed in a successful kitchen with the aim of designing one later in class. The teacher will note all of their contributions down onto a poster that will remain displayed in the class for the rest of the lesson. **Step 2: dissecting a task into steps.** Each student is asked to think of a task that they usually do in the kitchen. The teacher gives an example of making a cup of tea. They are then asked to break that task down into as many steps as possible e.g.

		• Filling the kettle • Putting the kettle on to boil • Getting a cup • Getting a tea bag • Putting the tea bag into the cup • Pouring the boiling water into the cup • Draining the tea bag from the cup • Putting the tea bag into the bin • Getting the mill from the fridge • Pouring the milk into the cup • Putting the milk back into the fridge • Getting a spoon • Stirring the tea • Putting the spoon into the sink/ dishwasher • Tasting the tea The teacher gives students 5 minutes to break down a task of their choice. The teacher then asks students to share their task with other people at their table. The teacher explains that this is called "the work sequence". **Step 3:** **Teaching Strategy: Visualisation and class disscussion** The teacher asks students to close their eyes and to think about their kitchen. Students are asked to think about what three areas of the kitchen are used the most. The teacher accepts answers until the sink, fridge and cooker are said. The teacher then asks students to picture where those three areas are in their own kitchen. If an imaginary line was drawn between those three areas what shape would it make- triangle. The teacher explains that this is called "the work triangle" in interior design. A strong work triangle in a kitchen greatly reduces the amount of walking involved in food preparation. **Step 4: How to use Ikea kitchen planner** The teacher gives each student a laptop/ chromebook. Students are directed to Ikea kitchen planner. They are each asked to create an account on the website. The teacher refers back to the success criteria that was created earlier in the class on what makes a good kitchen. Students are also asked to consult their notes copies. The teacher shows them this video before they get started. **Step 5: Designing a kitchen with Ikea Kitchen planner** Students are given the rest of the class to design their kitchen using the website. The teacher will circulate the room at this time offering help and or advice. Students will showcase their design at the end of class or else finish it for homework.

PART 4. OF SCENARIO

RISKS AND SUGGESTED SOLUTIONS	**Risk 1**: Lack of internet may inhibit interactive work. **Solution 1**: Therefore book school digital devices in advance. e.g. chromebook or computer room. **Risk 2**: Lack of ICT skills may deter students from completing work online or engaging with digital elements of learning. **Solution 2**: Subtitles to be used for video for international students. Differentiated worksheets for students with additional learning needs Develop cross curricular links with I.C.T. and other subjects that promote I.C.T. skills. **Risk 4**: Covid restrictions (social distancing) may prevent group work indoors/ classroom. **Solution**: Shorten group work to 5 minutes and facilitate pair work instead at intermittent periods. If school facilities allow – use external space outdoors and bigger classroom space such as the school library.

FRAME GAME

PART 1. OF SCENARIO

TITLE	**FRAME GAME**
MAIN SUBJECT	**NATURAL SCIENCES (GEOGRAPHY)**
OTHER SUBJECTS/DISCIPLINES	**BIOLOGY, PHISICS, CHEMISTRY**
TYPE	**Single lessons**
DURATION OF CLASSES	**3 lessons x 45 minutes**
AGE OF STUDENTS	**15-19**

PART 2. OF SCENARIO

AIM OF CLASSES		- Knowledge of main topic of the game (describe range of knowledge)..... -Practicing of skills (describe range of skills) .....
LEARNING OUTCOMES	IN THE FIELD OF KNOWLEDGE	• knowledge of basic concepts • knowledge of the selected subject area • knowledge of the material in the chosen subject area
	IN THE FIELD OF SKILLS	• ability to find information in various sources • ability to separate important facts from less important facts • ability to interpret the given information • time management skills
	IN THE FIELD OF SOCIAL COMPETENCES	• ability to work in a group • ability to use the strengths and weaknesses of individual group members • ability to communicate with each other

TEACHING METHODS	Discussion, group work, solving problems with the use of different scientific sources.
SUGGESTED TEACHING TOOLS/MATERIALS NEEDED	- Description of the rules of the game. - A game board with a size adapted to the number of players and the size of pawns (each field should fit several pawns). - Pawns in the number corresponding to the number of players (or groups). Every pown should be marked with consecutive numbers, letters of the alphabet or the players' initials. - A dice. - A set of questions and commands for individual items along the route with correct answers and supplementary information.
PRELIMINARY CONDITIONS (if applicable)	General knowledge
TIPS / METHODOLOGICAL REMARKS	If more than 10-15 participants join the game, it will be difficult to complete it in 45 minutes and you will need to find more time. It is also possible to create 2-3 person teams that will play together and it makes the time of the game shorter.

PART 3. OF SCENARIO

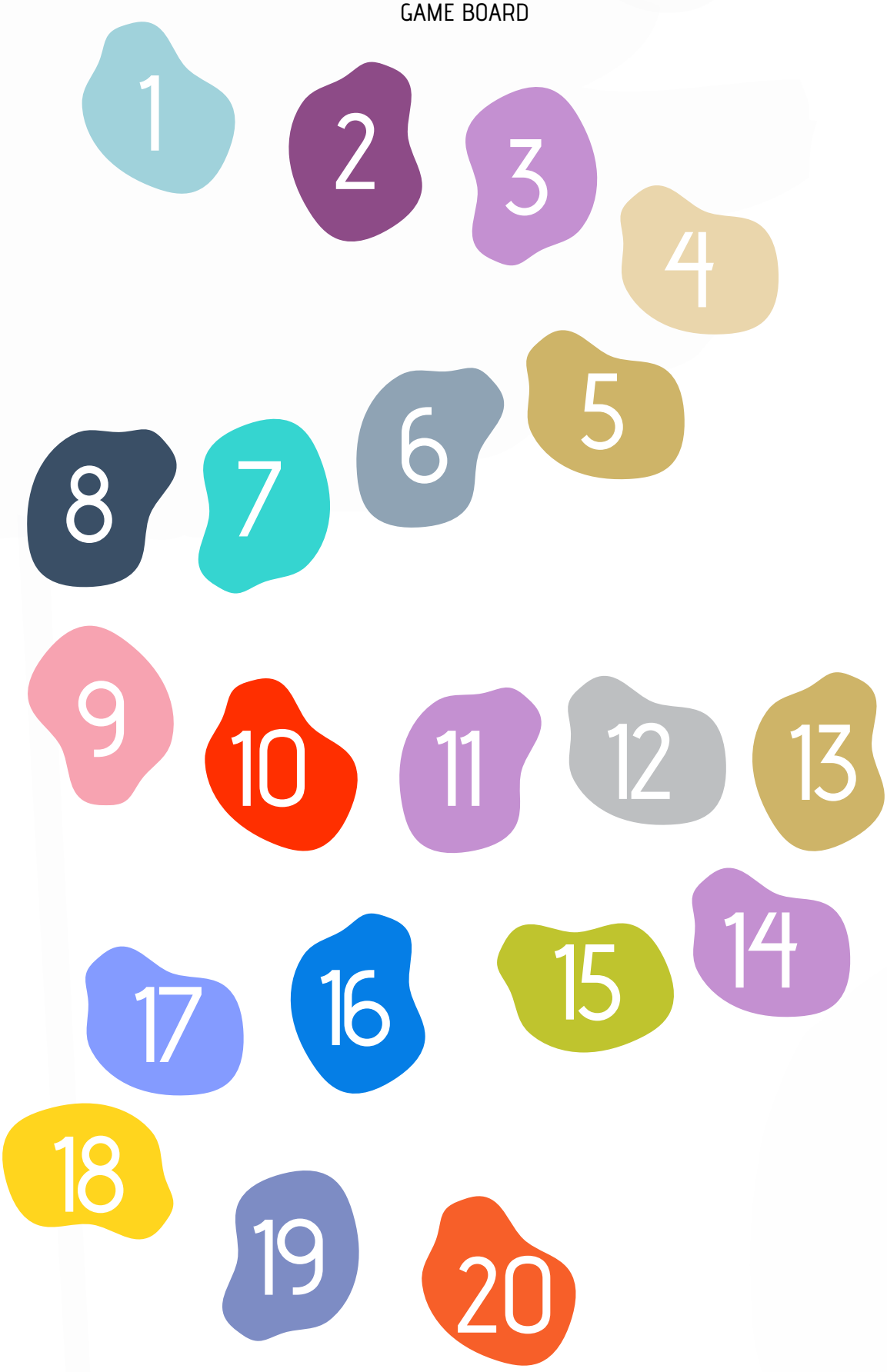
LEARNING CONTENT - DETAILED CHARACTERISTICS	Can be chosen by the teacher
BASIC TERMS	Dependent on the topic of the game

STRUC- TURE	GAME RULES The initial state of the game (introduction) .... Functions of the game participants Leader (teacher)..... ..... Game rules 1. Each player or a group chooses their pawn and places it on the board (position START) near the field marked with the number 1. 2. The leader (teacher) makes the order of participation in the game, which will be valid until the end of the game. 3. The order of the participation in the game does not affect the number of moves made by individual players. The game can only be over when all the players have made the same series of moves. 4. Each item on the route is assigned a question or command. The competitor (or group of players) in the new position must correctly answer the question or follow the instructions. 5. The player reads the appropriate commands or questions and four possible answers, and then states whether the given task has been properly performed. 6. The leader (teacher) does not read the correct answers but determines whether the task has been performed correctly or not. 7. After getting the correct answers to some of the questions, the facilitator can read the supplementary information (if there is one). 8. The correct answer to the question assigned to a given field allows the pawn to remain on it. An incorrect answer or no answer will force the pawn to be withdrawn to the position it had previously held. 9. Returning to the numbered field that we had before the incorrect answer, we do not have to answer the assigned question. 10. The game ends when the first or several first players leave the field No. 20. 11. The winners will receive prizes (these may be school grades).

STRUC- TURE	SEQUENCE OF THE ACTIVITIES IN THE GAME - The first player (or group) throws the dice and places his pawn on the field marked with the number that was the result on the dice. - The player reads the question and possible answers or the command corresponding to the number of the field on which the pawn has stopped. - After obtaining the correct answer, the leader (teacher) allows the pawn to remain in the drawn position. In some cases, the leader (teacher) also reads information that supplements the correct answer. After receiving an incorrect answer or in the absence of a reply, the leader orders the pawn to return to the position it had previously held. - These actions are performed by all players or all groups according to the order until the turn is completed. - The second and subsequent turns are performed in the same way. The pawns move in as many positions as there were spots on the dice, and after the wrong answer, they return to their previous positions. We perform these activities until the end of the game. SET OF QUESTIONS AND COMMANDS FOR INDIVIDUAL ITEMS IN THE GAME Along with possible answers. 1. ..... a) ..... b) ..... c) ..... d) ..... 2. ..... a) ..... b) ..... c) ..... d) .... 20. ..... a) ..... b) ..... c) ....

PART 4. OF SCENARIO

GAME BOARD



PART 1. OF SCENARIO

TITLE	**Coding on mathematical lessons**
MAIN SUBJECT	**MATHEMATICS**
OTHER SUBJECTS/DISCIPLINES	**Art, English**
TYPE	educational project
DURATION OF CLASSES	5 different single lessons (revisions) INTRODUCTION: How to use what is needed for a lesson (attachment nr 17). Each lesson (scenario) is prepared to follow (step by step) by THIS introduction. In scenario 1-5 is shown the second way of working with students. 1. "Christmas time" (square equations and square inequalities) 2. "Saint Nicholas Day" 3. "Valentine's Day" 4. "Happy Easter" 5. "Be likeS-uper Man" (Properties of function)
AGE OF STUDENTS	**15-18**

PART 2. OF SCENARIO

AIM OF CLASSES	**Lesson 1 CHRISTMAS TIME** **BASIC VOCABULARY:** Square equation, square inequality. Solutions of square equations and square inequality **Aims:** I know the difference between square equation and square inequality I can solve square equation I can solve square inequality I can draw a graph of square function **Lesson 2 ST. NICHOLAS DAY** **Aims:** I know what power, root, absolute value are.