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ONLINE GUIDEBOOK

FOR STUDENTS & TEACHERS HOW TO THINK AND
CREATE STEM+ARTS EDUCATION PROJECTS



English | Türkçe | Polski | Română | Ελληνικά | Lietuvių | Български

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ABSTRACT

What is the purpose of the guidebook?

A STEAM activity is a lesson that covers STEAM subjects: Science, Technology, Engineering, Art, and Math. STEAM education is integral, one of the modern methods of education, thanks to which children's critical thinking is encouraged in solving real life problems, by basing the theory on various practical activities.

Next Generation Science Standards through STEAM-NGSS, No. NGSS- 2020-1-TR01-KA201-094463 project aims to promote STEM+Arts in early childhood education through the novel approach that will focus on Social and Emotional Learning concept (SEL), integrated with interactive approaches (e.g. drama, gamified learning, physical education etc.), involving social, emotional skills as well as cognitive skills.

The online guidebook for students and teachers how to think and create STEM+Arts education projects is the fourth intellectual output of the project. It serves several purposes.

First of all, this online guidebook introduces the ideas of what features are necessary for a good STEAM activity. Also it presents samples of refined good practices from each partner country. It will illustrate how to act as a role model by integrating the principles of sustainable development into practice. What is more, the works of the winners of NGSS Project STEAM Materials Competition are provided. The online guidebook will also contain data of common implementations with images taken during the learning, teaching and /training activities.

What is the target group of the guidebook?

The target group for the online guidebook for students and teachers on how to think and create STEM+Arts education projects are individuals or organizations involved in STEAM education or interested in implementing STEAM. First of all, it meets the needs of early childhood education teachers and increases their capacities to deliver new classroom approaches based on innovative interdisciplinary STEM+Arts learning for children. It will also help pre-primary and primary school pupils (4-11 years old, especially girls) to increase motivation and participation in STEM+Arts learning.

What is “good” STEAM activity?

A good STEAM (Science, Technology, Engineering, Arts, and Mathematics) activity should have the following features:

1. Hands-on and interactive. The activity should be hands-on and interactive, allowing participants to engage with the material in a meaningful way. This can include building or creating something, conducting experiments, or solving problems.
2. Multidisciplinary. The activity should incorporate multiple STEAM disciplines, such as science, technology, engineering, arts, and mathematics. This helps to expose participants to a range of skills and knowledge, and encourages them to see the connections between different subjects.
3. Engaging and fun. The activity should be engaging and fun, capturing participants' interest and encouraging them to stay engaged. This can be achieved through the use of games, puzzles, challenges, or other interactive elements.

4. Open-ended and flexible. The activity should be open-ended and flexible, allowing participants to explore and experiment in their own way. This encourages creativity, problem-solving, and critical thinking skills.
5. Real-world relevance. The activity should have real-world relevance, showing participants how STEAM skills are used in everyday life and in various industries. This helps to make the learning experience more meaningful and applicable to their lives.
6. Inclusive and accessible. The activity should be inclusive and accessible to a range of participants, regardless of their background or abilities. This can be achieved through the use of materials and equipment that are easy to obtain and use, and by providing clear and simple instructions.

ATTRIBUTES OF “GOOD PRACTICE” IN STEAM EDUCATION

- **Attract and motivate children, both boys and girls**
- **Fully engage them, to engage “their mind and body in the same time**
- **Increase children’s interests for STEAM**
- **“inspire to inspire”**

- **Is easy to implement, is not consuming big time and financial resources**

“GOOD PRACTICE” ATTRIBUTES

- **Allows creative, innovative ways to do things, help to get “out of the box”**
- **Allows students to put their theoretical knowledge into practice (offer an active and experiential learning with hands-on experimentation), to become good inquirers, to work in teams/groups**
- **Provide more stimuli and more fun**

- **Offer authenticity – children must work and use authentic tools and instruments, not just toy ones**
- **Offer the possibility of obtaining meaningful artefacts**
- **Involve and develop digital skills, both in children and teachers**

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<https://drive.google.com/file/d/1Ao3gc4VEuBFE1LgVrSxdRBIK1ABa3nX/view?usp=sharing>

STEAM ACTIVITIES

Games

Games are useful in STEAM (Science, Technology, Engineering, Arts, and Mathematics) education for several reasons. First of all, games are often designed to be fun and engaging, which can help to motivate learners to actively participate in the learning process. This can be especially helpful for learners who may not be as interested in traditional lecture-based instructions. Games can be used to teach a wide range of STEAM concepts such as coding, physics, chemistry, and engineering, among other subjects in a fun and interactive way. What is more, many games require players to solve problems and think critically in order to progress through the game. This can help to develop important STEAM skills, such as logical reasoning, spatial awareness, and data analysis. Many games also encourage creativity, allowing players to experiment with different strategies and solutions to solve problems. This can help to develop STEAM skills such as design thinking and innovation. Finally, games often provide a safe environment for learners to experiment and try out different solutions without fear of failure. This can be especially helpful in STEAM education, where experimentation and trial-and-error are important parts of the learning process.

NGSS Game (Bulgaria)

TITLE OF THE ACTIVITY	BUILDING A MODEL
AGE GROUP	Suitable for pre-primary and primary level
DURATION	45 min
SETTING (OUTDOOR OR INDOOR)	Indoor, provide enough space for movement
AIMS OF THE ACTIVITY	<p>Children will learn:</p> <ul style="list-style-type: none"> • how to communicate effectively; • active listening; • spatial and constructive thinking
DESCRIPTION OF THE ACTIVITY	<p>Group Size – Minimum 3 people, up to about 7.</p> <p>(You can have duplicate exercises running in parallel if the group is larger, but will need more sets of building blocks).</p> <p>There are 4 roles in this communication skills game.</p> <p>A – director B – runner C – builder D – observer(s)</p> <p>Person A is given the built-up set of blocks, and is the only person who can see the object. It is the director's job to give clear instructions to person B, the runner, so that person C can build an exact replica of the model.</p> <p>Person B listens to the director's instructions and runs to a different part of the room to where person C is sitting. The runner then passes on the building instructions, without seeing the building blocks, to Person C, the builder. The</p>

runner can make as many trips as required within the time allowed for the exercise.

Person C listens to the runner's instructions and builds the object from the set of building blocks. The builder is the only person who can see the object under construction and building materials.

Person(s) D observe the communication game, and make notes about what works, what doesn't work, and how people behaved under pressure etc., to pass on to the group later.

Set a time limit for the exercise of 10 minutes.

When the time is up, allow the group to compare the model and the replica, and see how closely it matches. Generally, the replica will bear little resemblance to the original, which usually causes heated discussion!

Allow the group to reflect on how the exercise went, and agree 1 thing they did well, 1 thing that didn't work, and 1 thing they would do better next time.

Run the exercise again, either switching or keeping original roles, and see if any improvements have been made. Make sure you de-construct the "original" model and create a new design!

This simple communication skills game can be run many times without losing learning potential. Teams can add layers of sophistication to their communication by making use of aids such as diagrams, codes, standard procedures and using active listening techniques.

Variation 2:

2 children are sitting at the same table, but there is an opaque barrier between them, one child has an assembled figure of Lego elements, and the other has the same elements available, but not assembled. The child holding the assembled figurine gives instructions to the other child who is tasked with assembling the same figurine. Some realistic time is given, depending on the age of the children (10-15-20 min.) and finally the model and the copy are compared.

	<p>This variant has 2 varieties - one is that the child who performs the instructions has exactly the same appearance (in shape and even in color) and number of elements as those from which the model is made; the second is complicated - among the elements there are some redundant.</p>
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	<p>2 matching sets of children's building blocks (e.g. Lego), with 10 blocks and 1 base board in each set. Using one set of blocks, build a random object using the 10 blocks, onto the baseboard. Optional - 2 bags to contain each set of building blocks.</p>
REFERENCES, IF ANY (website - books)	<p>http://instructionalstrats.weebly.com/listening.html</p>

NGSS Game (Greece)

By Maria Ampartzaki & Kyriaki Trichaki, University of Crete

TITLE OF THE ACTIVITY	USE THE RIDDLE TO FIND THE INGREDIENTS
AGE GROUP	4-10
DURATION	40 min
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	Children will learn about the main ingredients of pastry products. Through this process will realise that fresh dough changes texture after baking.
DESCRIPTION OF THE ACTIVITY	<p>Important Steps</p> <ol style="list-style-type: none"> 1) Children pull out paper lots with riddles which describe positions in the school building, e.g. your next finding is placed behind objects we borrow (books in the library). Children will have to guess which is the place described by the riddle. 2) Once they guess the place described by the riddle children must visit it and search around to find a hidden cooking ingredient. There will be four cooking ingredients: flour, milk, oil and sugar. 3) When children find them all, are asked to work in groups to make suggestions as to what can these ingredients potentially make. They are dictating their hypothesis to the teacher who writes them down. For example, children can suggest that the above ingredients can be used to make bread, cake, biscuits, etc. 4) The teacher uses a large and well written pastry book to read out loud the recipes for each of children's suggestions and asks the children to discuss and verify or reject the initial hypotheses. For example, if the children suggested they could make bread the recipes will show that the ingredients are more suitable for cakes and biscuits, unless they want to make milk bread or sweet bread. 5) After the discussion children can choose their favorite recipe by ballot and execute the chosen recipe.

	<p>6) Children discuss about the ingredients that are still missing and needed to execute a full recipe (e.g. eggs, baking powder etc.)</p> <p>7) They discuss about changes in the dough texture due to the chemical reactions during baking.</p> <p>8) Children can also discuss about taste and the way the dough gets fluffier.</p>
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	Good quality pastry books with large, high resolution photographs, pastry ingredients.
REFERENCES, IF ANY (website – books)	

NGSS Game (Turkey)

TITLE OF THE ACTIVITY	MOTION PROPERTIES
AGE GROUP	8-9 Ages
DURATION	30 min (20 min indoor, 10 min outdoor)
SETTING (OUTDOOR OR INDOOR)	Indoor and Outdoor
AIMS OF THE ACTIVITY	To make students to define motion properties. Speed Up, Slow-Down, Swing, Circular Motion.
DESCRIPTION OF THE ACTIVITY	<p style="text-align: center;">Steps</p> <ol style="list-style-type: none"> 1) How does the car move? 2) Define and describe its movement. 3) After that students are asked to make the activity about motion and motion properties given below. (Wordwall) 4) Finally groups go outdoor, every group design a motion type or property and show the other groups.
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	https://wordwall.net/tr/resource/38862975
REFERENCES, IF ANY (website - books)	wordwall.net
PICTURES OR VIDEOS UPLOADED	https://www.youtube.com/watch?v=elAzkXyRQFU

Drama activities

Drama can play a valuable role in STEAM (Science, Technology, Engineering, Arts, and Mathematics) education by helping to engage students in interdisciplinary learning and promoting creativity and collaboration. Drama can help students develop effective communication skills, such as speaking clearly, listening actively, and using non-verbal cues. These skills are crucial for presenting scientific research or engineering solutions effectively. Also, drama can help bring STEM concepts to life by incorporating role-playing, improvisation, and other interactive activities. For example, students could act out a scientific experiment or engineer a solution to a hypothetical problem. Drama activities often involve group work, which can encourage students to work together and share ideas. This skill is essential for STEAM fields, as many projects require teams with different areas of expertise. Drama provides a platform for students to express their creativity and imagination. This skill is crucial in STEAM fields, where innovation is essential for developing new technologies and solving complex problems. Incorporating drama into STEAM education can help students develop a range of skills that are valuable in STEM fields and beyond. By providing a dynamic and engaging learning environment, drama can help students become more confident, communicative, and innovative.

NGSS Drama (Bulgaria)

TITLE OF THE ACTIVITY	GROW A SEED
AGE GROUP	Pre-school
DURATION	~ 30 min
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	<p>Children will learn:</p> <ul style="list-style-type: none"> ● to express thoughts, ideas and opinions; ● about the life of plants. ● about steps in a process; ● to describe a sequence.
DESCRIPTION OF THE ACTIVITY	<p>Part one-Connect:</p> <p>Show the students the image of the scene of the girl with a watering can (use the activity card from Lego or similar) and tell them that this scene is about people planting a seed.</p> <p>Ask the students to name some things that are needed to plant a seed (e.g., shovel, watering can, fertilizer, etc.).</p> <p>Ask them what should be done first when planting a seed. Then ask what should be done next, and so on.</p> <p>Act out planting imaginary seeds as a group. Ask the students to retell the steps as they act them out.</p> <p>Discuss what seeds need in order to grow into plants. Have students act like seeds growing into plants.</p>

Part two- Construct:

Tell the students to build a scene showing what happens to a seed that receives everything it needs.

Remind the students to pick a background card that is appropriate for their story.

Part three- Contemplate:

When the students have finished building, encourage them to take turns sharing

their scenes and telling a story about the seed.

Ask the students to role-play how people took care of their seed to make it grow.

Consider asking questions like:

What happened to the seed?

What kind of a plant or flower did the seed become? Did it produce a fruit, vegetable, or legume?

What did the characters do in the scene?

Part four- Continue:

Talk with the students about gardens. Ask them to describe a garden and what it needs to grow.

Ask them to combine their plant models or build new models to create a garden.

Encourage the students to use figures to role-play taking care of the garden.

	<p><u>Follow-up</u>: Children can be told to actually plant a real seed and observe it growing- they can draw a picture of every stage, or describe it orally.</p>
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	<p>StoryTales Set by Lego for Education; Or a similar constructor with printed story cards.</p>
REFERENCES, IF ANY (website – books)	<p>The lesson is from https://education.lego.com/en-us/lessons/preschool-storytales/little-seed#contemplate</p>

NGSS Drama (Greece)

By Vasiliki Giannakou, 7th kindergarten- Rethymno, Crete & Maria Kreza, University of Crete

TITLE OF THE ACTIVITY	“SUDDEN RAIN”
AGE GROUP	4-6
DURATION	40 min (10 min outdoor, 30 min indoor)
SETTING (OUTDOOR OR INDOOR)	Outdoor and indoor
AIMS OF THE ACTIVITY	The aim of the activity is to make students work in groups (by role-playing) to find a way to protect themselves from the rain. It can be the beginning of an inquiry.
DESCRIPTION OF THE ACTIVITY	<p>Important steps:</p> <p>Children observe the street during rainfall and record what people do to protect themselves from the rain.</p> <p>Then teachers engage children in the following drama activity:</p> <p>First phase: activation (using music)</p> <p>Whilst music plays children move in space without touching each other and according to instructions, e.g. “walk slowly, walk fast, crouch, run”.</p> <p>Second Phase: Then groups of 4-6 children form and engage in a role play where the question is: “It is suddenly raining! What will you do to protect yourselves?”</p> <p>There are plenty of materials in the room, and the groups must choose what they think is appropriate and continue the role play.</p>

	Final Phase: Each group presents the solutions they found and tries to justify their choice. At this stage, the teacher poses the central question: "Why do you think that these materials or the way you have chosen, will protect you from the rain?"
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	Papers, plastic, clothes, newspapers, towels
REFERENCES, IF ANY (website – books)	
PICTURES OR VIDEOS UPLOADED	



NGSS Drama (Romania)

By Alina Stefanescu, Preschool Education Teacher, Kindergarten no.13 of Targoviste

TITLE OF THE ACTIVITY	„JOURNEY IN FAIRY TALES LAND!“
AGE GROUP	<p>Age of children: 5-6 years old (but can also be organised for children up to 11 years old, depending on the complexity of the roles/questions involved)</p> <p>Level of education: pre-school or different levels of primary school</p>
DURATION	35 minutes
SETTING (OUTDOOR OR INDOOR)	Indoor (classroom)/ out-door when the weather is fine; 6 tables and chairs around,
AIMS OF THE ACTIVITY	<ul style="list-style-type: none"> ✓ Stimulates preschoolers' creativity, collective and individual thinking; ✓ Encourages and exercises the communication abilities; ✓ Develop the skills of logical and linguistic intelligence; ✓ Develop emotional awareness; ✓ Develop the ability to make decisions; ✓ Encourages constructive thinking.
DESCRIPTION OF THE ACTIVITY	<p>The activity consists in small dramatic acts starting from the one or two stories (e.g., “Snow White and the Seven Dwarfs”, “The Little Mermaid”).</p> <p>This drama activity was based on the "Thinking Hats" method - a technique for stimulating the creativity of the children. This method supposes the interpretation of roles according to the color of the chosen hat: white, red, black, yellow, green, blue.</p>

STEPS:**➤ Presentation and intuition of the new material:**

- The 6 different coloured hats that will be placed on the tables are presented for the formation of groups;
- Images from the story "Snow White and the 7 Dwarfs" and "The little Mermaid" .

➤ Theme announcement: with these magic hats we play the game "Thinking Hats", each hat has different powers;**➤ The Formation of the groups** - children are divided into groups of six (one child for each hat) and each team is seated around the table; under each hat children will find answers, solutions etc.;

they will consult each-other and perform the hats` role by taking turns, or being organised by a team leader,

the explanations for the roles of each hat are presented to the children:

- **the white hat** presents the facts as they happened, without commenting on them;
- **the red hat** has the role of expressing the feelings awakened by the story;
- **the black hat** has the role of presenting the negative(s) in the story;
- **the yellow hat** has the role of appreciating positive (good) things;
- **the green hat** has the role of finding another solution to the problem in the story;
- **the blue hat** has the role of leader of the discussions between the other hats.

➤ **Activity in groups:**

One by one, the children will put one hat on their head and draw a ticket; the teacher or an older child will read the ticket and will state what is required; the response is given by the children from the same group; only if no one in the group can give the correct answer they will ask children belonging to another group.

The white hat: the children helped by the questions drawn from the hat, will accurately report the data; e.g.

-What information do we have about Snow White? Why did the stepmother hate her?

- What do we know about the stepmother? What about dwarves?

The blue hat: defines the problem, leads the questions, synthesizes, monitors the game and follow the rules through simple interjections; choose the correct solution. Under this blue hat will also be the educator.

The red hat: playing under this hat role help children speak about what they feel, think, manage the emotions. E.g. of helping questions:

- How do you see this situation? How do you feel about these characters?

- Who should Snow White have asked for help and she didn't.

The black: hat help criticizes the attitude of the stepmother: The drawn tickets have the following content: -What is bad in the behavior of the empress? What drove her to do such evil things and want to kill an innocent child?

The green hat: offers solutions; e.g. of helping questions: - What would you have advised Snow White to do to get rid of the mischief of the mistress? How should he have proceeded? How would you have done it?

The yellow hat: presents positive aspects of the story, finds

	<p>benefits: - What lessons did Snow White learn from what happened to her?</p> <p>➤ Evaluation:</p> <p>With the help of the blue hat, a small summary of the conclusions of all the other hats is made, everyone has the right to express their opinion about the ideas issued.</p> <p>➤ Activity closure:</p> <p>At the end of this activity, a group of preschoolers will play a scene from the story they chose from one of the hats perspective. E.g. the green hat perspectives – they play Snow-White encounter with the step-mom when they first met in the forest, by changing the characters` behaviour as they discussed earlier – how should have Snow-White proceed when she met the old-lady (step-mother).</p> <p>Alternative: instead of them playing the roles, the children can play with characters` marionettes.</p>
<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<p>6 hats(white, blue, red, yellow, green, pictures from „Snow White and The Seven Dwarfs“), silhouettes of main characters, laptop, theater frame, marionettes.</p>
<p>REFERENCES, IF ANY (website – books)</p>	<p>https://www.youtube.com/watch?v=iM2Fws06bFY</p> <p>https://www.youtube.com/watch?v=pf_xz7GFCHw</p>
<p>PICTURES OR VIDEOS UPLOADED</p>	<p>https://www.canva.com/design/DAFThFOWaNc/INrPQi5DR7qL9eRCGR-q3g/watch?utm_content=DAFThFOWaNc&utm_campaign=designshare&utm_medium=link&utm_source=publishsharelink</p>

NGSS Drama (Romania)

By Maria-Magdalena DINESCU, Primary Education Teacher, "Radu cel Mare"
Secondary School Târgoviște

TITLE OF THE ACTIVITY	BOASTFUL GEOMETRIC SHAPES (SQUARE, RECTANGLE, TRIANGLE, CIRCLE)
AGE GROUP	6-7 years (preparation class of primary school)
DURATION	45 minutes
SETTING (OUTDOOR OR INDOOR)	Indoor – the classroom
AIMS OF THE ACTIVITY	<p>By the end of the class the pupils will be able to:</p> <ul style="list-style-type: none"> - describe geometric shapes; - identify geometric shapes in the immediate environment; - create, in a group, images from cut-out geometric shapes;
DESCRIPTION OF THE ACTIVITY	<p>I. The introduction moment</p> <p>Students will listen to the song of geometric shapes.</p> <p>We have a discussion and ask them to name the shapes that appeared in the video.</p> <p>https://www.youtube.com/watch?v=qNOjrWwMCTw</p> <p>They will find that the rectangle is missing.</p> <p>II. Announcing the theme and objectives</p> <p>I will announce to the pupils that they will become characters</p> <ul style="list-style-type: none"> - boastful geometric shapes that think they are the most beautiful. <p>III. Carrying out the activity</p> <p>Four students will be the geometrical characters who introduce themselves boasting about their perfect shapes.</p>

Everyone thinks about himself that he is the most beautiful.

1. THE SQUARE – Hello children! My name is Square. I have 4 equal sides and 4 corners. You can find me in the form of pillows, paintings and even some windows. Aren't I perfect?

Children - Yes!

2. THE RECTANGLE – What are you saying there? I also have 4 sides and 4 corners. In addition, I have two of the opposite sides larger and the other two smaller. I am a Rectangle. You meet me in the form of doors, blackboards, big television screens. I am the most beautiful!

Children - Yes!

3. THE TRIANGLE – Offf! You are still very proud! I am Triangle. And yes, I don't have 4 sides, I just have 3 gorgeous sides and 3 sharp points. They can take the shape of a house roof, a slice of pizza, a coat hanger. If you make me angry, I can stab you!

4. THE CIRCLE- Have we heard of corners and stings? My name is Circle, I have no corners, I have no sides. I am perfectly round like the disk of the sun, like the full moon, like a tasty pizza and I am very happy!

IV. Retention and transfer assurance

After listening to the presentations, the children are encouraged by the teacher to point out objects in the immediate environment they think that are like the 4 characters. Then, the teachers suggest them to join forces to achieve something great, as the Romanian saying is known: "In union lies strength!" . There for, the children will work in groups, and they will create a work of their choice from geometric shapes.

The activity end with a fun game: Race of geometric shapes.

MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	Geometric shapes either cut out or made of plastic material, glue, plasticine, laptop, smart board
REFERENCES, IF ANY (website – books)	https://manuale.intuitext.ro/manuale-digitale/MEM_Clasa1_voll/index.html# https://www.scoalaintuitext.ro/rasfoieste/caiet-mem1-s1 https://www.youtube.com/watch?v=qN0jrWwMCTw https://www.youtube.com/watch?v=QfERZ02jXgw
PICTURES OR VIDEOS UPLOADED	<p style="text-align: center;">DRAMATIZARE</p> 

NGSS Drama (Turkey)

By Dilber Yıldız (EN)

TITLE OF THE ACTIVITY	HOW TO USE GEOMETRIC SHAPES TO CREATE CUBIST ARTWORK?
AGE GROUP	It is a plan prepared for the pre-school children
DURATION	<p>(30 minutes)</p> <p>1. period: to inspire, to create curiosity, to draw the attention</p> <p>2. period: study, manipulate materials</p> <p>3: period: presenting results</p>
LEARNING ENVIRONMENT	<p>A suitable atmosphere that the children can feel comfortable should be created. They will sit on the cushions in the classroom or the seating arrangement as in the L shape on the tables or outdoors in the good weather in the garden that the children feel free. This atmosphere will make the children feel free for the internal cognitive process and will encourage them to think and create limitlessly. This kind of atmosphere increases the children's efficiency and usefulness.</p>
STEAM & SEL Competences	<ul style="list-style-type: none"> <input type="checkbox"/> Knowledge about the natural world <input type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy

¹ More information on Social and Emotional Competences:

<https://drive.google.com/file/d/1Ao3gc4VEuBFE1LgVrSx-dRBIK1ABa3nX/view?usp=sharing>

	<ul style="list-style-type: none"> <input type="checkbox"/> Spatial thinking <input type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Confidence & Assertiveness Integrity <input type="checkbox"/> Curiosity <input type="checkbox"/> Empathy
<p>EXPECTED LEARNING OUTCOMES</p>	<p>At the end of the lesson unit, students will be able to:</p> <ul style="list-style-type: none"> • Recognise basic geometric shapes and their occurrence in real life. • Distinguish and explain the differences and similarities between a triangle, a square, a rectangle and a circle. • Define the concepts of corner, angle and side; connect them to a variety of geometrical shapes,

	<ul style="list-style-type: none"> • Recognise the basic concepts of cubism. • Perform a simple abstraction exercise (analyse, decompose and recompose a piece of work)
SUBJECTS AND TOPICS COVERED	<p>SUBJECT: Mathematics</p> <p>LEARNING FIELD: Introduction to geometrical shapes; sides, corners and angles of 2D shapes</p> <p>TOPIC: How to use geometric shapes to create cubist artwork?</p>
METHODOLOGIES	<ul style="list-style-type: none"> <input type="checkbox"/> Design Thinking <input type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input type="checkbox"/> SCAMPER <input checked="" type="checkbox"/> Montessori 3-stage lesson
TOOLS / MATERIALS / RESOURCES	<ul style="list-style-type: none"> ✓ Colouring pages, ✓ colour papers, ✓ different geometric shapes, ✓ pastel colours, glue, ✓ spaghetti, ✓ marshmallow.
DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS	<p>Stage 1: to inspire, to create curiosity, to draw the attention.</p> <p>The teacher enters to the classroom with a hat that has geometric shapes to draw attention. This hat with geometric shapes is fantastic, appealing and amusing.</p> <p>Show basic geometric shapes that have been prepared before and ask students what they might have in common and how they differ from each other.</p> <p>Ask for answers to help them understand the concept of corners and edges. Ask students where they can find these geometric shapes in real life. For example, a bottle may have a circle at the</p>

bottom; an envelope may be shaped like a square or a rectangle. Some objects may have shapes more than one; for instance, a bottle may have a circle at the bottom, however, it can have a rectangular tag.

Stage 2: study, manipulate materials.

Students are asked questions about the works of the cubist painters they have studied. Ask students to describe the geometric shapes on each picture and introduce the concept of regular and irregular shapes. It is ensured that the students notice the edges, corners and shapes in the pictures. Then, colouring pages containing various shapes are given to the students and the geometric shapes on the page are examined. Students will colour geometric shapes using different colours later if they wish. Cubist artists colour some various objects with several different colours and patterns. Divide students into groups. Groups will consist of 2 or 3 students. Give students coloured A4 paper, glue and coloured cardboard. Ask students to design a cubist piece of art using these materials. These works, designed by students, are transformed into three-dimensional works by using pasta and marshmallows. The activity continues until students create an amusing, interesting, three-dimensional design standing.

Stage 3: presenting results.

After the students have completed the work, they have designed, they are asked to explain how they have created a work of art. Ideas and feedback are provided from all group members. After all groups share the features of their works, all designs are brought together and exhibited as a STEAM Art project.



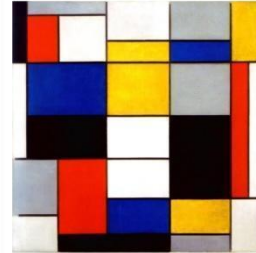
Georges Braque - Estaque'de Viyadük / 1908



Fernand Leger - Uzaydaki Formlar / 1950



Georges Braque - Kupa / 1911



Piet Mondrian - Kompozisyon / 1929

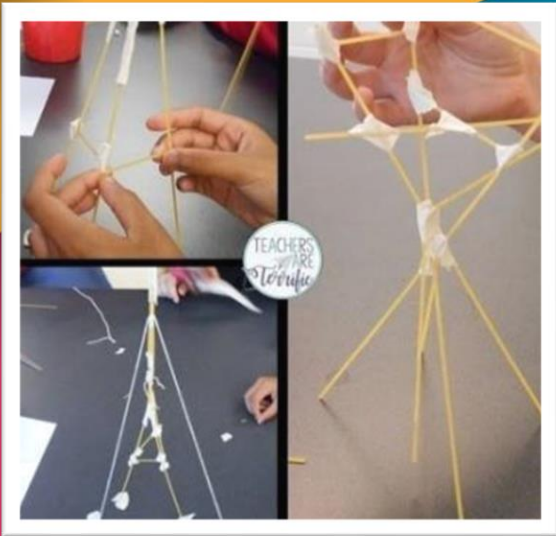


Pablo Picasso - Guernica / 1937

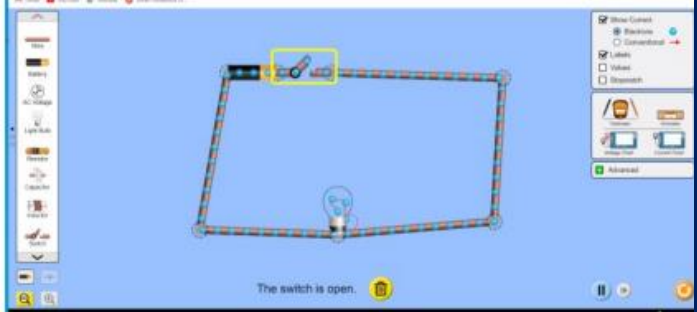
Design Example of Kids;

	
<p>INTEGRATION OF ART</p>	<p>The unit covers the creation of a cubist design. This allows the students to identify the differences and correlations of a variety of geometrical shapes in a hands-on and visual approach. Students will be asked to carry out a basic analysis of their artwork, and to compare and contrast with the work of their peers. They will also be encouraged to exchange ideas and other feedback on each other's artwork. Based on the Design Thinking approach, this unit will cover the following stages: discover, interpret, and ideate and prototype.</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>When drawing and colouring in, allow students to express their personality, but do not suggest choices based on stereotypes (e.g. pink for girls). When forming groups, ensure there is an equal gender representation, as far as possible, so that the exchanges within the group contain diverse viewpoints. As far as possible, ensure that speaking time within the group is equally shared.</p>

<p>FEEDBACK & ASSESSMENT</p>	<p>Ask for oral feedback from students during the lesson, to assess their understanding and interest in the task. Provide constructive feedback and offer suggestions if they are stuck, apart from the process when you give instructions and you explain the second point; be aware that that art creation can be messy and noisy, as long as the students are on task.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>Compare the quantity and quality of the final output to identify which students may thrive more in such a creative environment, and which students may find it more difficult and why (e.g. need to improve some social skills, preference of a different learning method, etc.)</p> <p>The result of the lesson will be a tangible product for each student, a work of art in the style of Cubism to display their work in the classroom.</p> <p>Students are first shown visuals about the works of cubist painters. It is ensured that they notice the edges, corners and shapes in the pictures. Afterwards, it is said that they will design such a work of art, and the first stage of the activity is started. The activity will be phases of group work so that communication and social skills will be developed.</p>
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>NonCommercial (nc)</p> <p>You let others copy, distribute, display, perform, and (unless you have chosen No Derivatives) modify and use your work for any purpose other than commercially unless they get your permission first.</p>



NGSS Drama (Turkey)

TITLE OF THE ACTIVITY	WHAT IS YOUR ROLE IN CIRCUIT?
AGE GROUP	7-8
DURATION	40+20 min
SETTING (OUTDOOR OR INDOOR)	Indoor and outdoor.
AIMS OF THE ACTIVIT	<p>Aim of the activity is to make students define the functions of components of an electrical circuit (by role playing)</p> <p>Also students are expected to tell clean energy resources.</p>
DESCRIPTION OF THE ACTIVITY	<p>Firstly groups of 7 students are constructed and each student is wanted to choose a component from electrical circuit to prepare his/her role (3 students will play as electrical flow). Students are asked to study the component's description and function.</p> <div style="text-align: center;">  </div> <p>Questions:</p> <ol style="list-style-type: none"> 1) What is the component's name? 2)What is its function? <p>Students are expected to wear similar colors</p>

	<p>of the component they chose and write their answers to questions above. After they made those preparations teacher organise the groups as a circuit and expect them to study their roles in circuit. After that the groups prepares a scene presentation including a story (For example: I need a table lamp for my room, how can I construct a lamp?)</p> <p>Techniques Used: Storytelling and role playing.</p>
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	Electrical wire, sun panel (3 Volt) , 2 batteries (2x1,5 volt), switch.
REFERENCES, IF ANY	https://phet.colorado.edu/sims/html/circuit-

NGSS Drama (Turkey)

TITLE OF THE ACTIVITY	ALL LIVING CREATURES & LIFE
TARGET GROUP	It is a plan prepared for the children aged 10 or 11 (4 th or 5 th grade)
DURATION	Warm up: 10 minutes Implementing: 50 minutes Result and evaluation: 20 minutes Total: 80 minutes
LEARNING ENVIRONMENT	A suitable atmosphere that the children can feel comfortable should be created. They will work in groups and with peers. This atmosphere will make the children feel free for the internal cognitive process and will encourage them to think and create limitlessly. This kind of atmosphere increases the children's efficiency and usefulness.
STEAM & SEL ² Competences	<input type="checkbox"/> Knowledge about the natural world <input type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy <input type="checkbox"/> Spatial thinking <input type="checkbox"/> Basic science concepts

² More information on Social and Emotional Competences:

<https://drive.google.com/file/d/1Ao3gc4VEuBFE1LgVrSx-dRBIK1ABa3nX/view?usp=sharing>

	<ul style="list-style-type: none"> <input type="checkbox"/> Computational thinking <input type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Drawing motivated conclusion <input type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input type="checkbox"/> Communication <input type="checkbox"/> Confidence & Assertiveness <input type="checkbox"/> Collaboration <input type="checkbox"/> Integrity <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p>EXPECTED LEARNING OUTCOMES</p>	<p>Students learn the fields where organisms live and they also learn man influence on nature</p> <ul style="list-style-type: none"> ✓ Students explain the concepts as species, habitat, population and ecosystem with samples ✓ Students explain the relationships of alive organisms with each other and inorganic factors in the ecosystem ✓ Students estimate about the living creatures in the different ecosystems

	<p>(BSB – 9)</p> <p>This plan ensures the development for the students not only on the cognitive field but also on the language, social and emotional fields; students</p> <ul style="list-style-type: none"> ✓ Develop the skills of decision making. ✓ Connect with daily life and what they’ve learned ✓ Give samples from the daily life ✓ Express themselves in creative ways. ✓ Improve their communication skills. ✓ Respect different opinions. ✓ Defend their opinions democratically
<p>SUBJECTS AND TOPICS COVERED</p>	<p>Subject: Science and Technology</p> <p>Learning field: All Living Creatures and Life</p> <p>Topic: Human being and Environment</p>
<p>METHODOLOGIES</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Design Thinking <input type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input checked="" type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori 3-stage lesson
<p>TOOLS / MATERIALS / RESOURCES</p>	<ul style="list-style-type: none"> ✓ Scamper questions ✓ Computer ✓ Loud Speaker ✓ Drawing Book

	<ul style="list-style-type: none"> ✓ Crayons ✓ Paints (Pastel, poster paint) ✓ Music
<p style="text-align: center;">DETAILED DESCRIPTION OF THE STEP-BY- STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS</p>	<p>First of all we should introduce the topic before initiating the steps and the scamper questions. Then 7 general steps are implemented as in the following. The sample questions are given to the children and let them think for a while. The Scamper questions should be open-ended questions.</p> <p>Warm up (10 minutes): The teacher motivates the children while giving information related to the learning field as All Living Creatures and Life; the lesson starts with music. The music audition contains the sounds of the bios in the forest ecosystem. At the beginning, the teacher does not give knowledge about the content of the music and the students listen to the sounds of the living and inanimate things; students use their imagination and guess the names of them and write down their names.</p> <p>Implementation (50 minutes):</p> <p>The teacher asks the students to share the names of the living and inanimate things with their groups and peers and the class. Also the teacher asks the students where the sounds in the music audition belong to and mentions about the concept as “ecosystem” and waits for the students to determine the sounds in the music audition belong to the Forest Ecosystem. Then, the teacher wants the students to choose a creature from the names that have been uttered at the beginning. So the teacher touches upon “Species” concept and asks the following questions:</p> <p>S: Substitute:</p> <ul style="list-style-type: none"> ✓ In what other environment can this creature / Species live? So by the help of this question, students can reach the concept of

“habitat” where all the living things can live and breed in the best way.

✓ What kind of features should this creature (species) have in order to live in another environment? (habitat is used as base)

C: Combine

✓ Is it possible for this creature (species) to be together with similar creatures (species)? (With that question the students come up with the concept of the “population” that is a troop of similar species who live in a specific area.)

✓ How important is it for this creature (species) to live together with the similar creatures in order to live for this creature? (So by the help of this question, students can reach the principle that the creatures (species) should live together in order to perpetuate and survive.)

A: Adapt

✓ What kind of creature or creatures (species) could be instead of this creature if this creature did not live in its environment (habitat)?

✓ What is the role of this creature (species) in the ecosystem?

M: Modify, Minify, Magnify

✓ What would be the role of this creature (species) in the ecosystem if it were lighter/heavier than the other creatures (species)?

✓ What would be the role of this creature (species) in the ecosystem if it were shorter/longer than the other creatures (species)?

	<p>P: Put to other uses</p> <ul style="list-style-type: none"> ✓ For which purposes do human beings use this creature (species)? (What kind of features of this creature (species) do human beings benefit from? ✓ For which problem’s solution can this creature (species) be used? ✓ How do you describe this creature’s (species’) features to someone? <p>E: Eliminate</p> <ul style="list-style-type: none"> ✓ What would happen if we removed this creature (species) from the ecosystem? ✓ What would happen if we understated this creature (species) in the ecosystem? <p>R: Reverse, Rearrange</p> <ul style="list-style-type: none"> ✓ Can we change the place of this creature (species) ? (Giving the other creatures’ (species)’ names that students have illustrated before)
<p>INTEGRATION OF ART</p>	<p>Students’ autonomous working:</p> <ul style="list-style-type: none"> ✓ The student can use their imagination by the help of the music audition they listen to ✓ The student can review his /her observation, knowledge and experiences related to the negotiated subject during the discussion process. <p>Performance indicators:</p> <ul style="list-style-type: none"> ✓ The student carries through the thinking process effectively.

	<ul style="list-style-type: none"> ✓ The student improves his / her communication skills while expressing his / her ideas and listening to his / her friends. ✓ Students can estimate about the creatures (species) that live in the different ecosystems so he / she improves his / her skills of decision making. ✓ The students can reflect the relationships of living organisms with each other and inorganic factors in the ecosystem to the pictures he / she will draw representing his/ her creativeness. ✓ The students can reflect the concepts of species, habitat, population, ecosystems and the topics he /she has learned to the materials they will prepare (posters, banners, poems, stories e.g.).
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>You can create study groups as mixed girls and boys. While students are designing, be careful not to direct them to stereotypes for boys and girls. Creating new products and revealing original ideas by using their creativity are our priorities during the activities.</p>
<p>FEEDBACK & ASSESSMENT</p>	<p>The Scamper Methodology develops the students' cognitive enhancement; they will be able to produce new & innovative products via using their imagination, this method enriches the children's skills of creative thinking, discernment, feelings & senses. The Scamper Methodology gives their emotional courage prominence and supports the children's social progress field to a great extent.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>Result and Evaluation (20 minutes)</p> <p>Finally, the teacher asks the students to draw the picture of the ecosystem using the opinions that they have acquired. The</p>

	<p>teacher wants the students to write their names at the back of their pictures they prepared. The teacher makes a general evaluation of the lesson and mentions the topics learned.</p> <p>The students realize the internal look as the best evaluation via thinking, producing & questioning.</p>
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>NonCommercial (nc)</p> <p>You let others copy, distribute, display, perform, and (unless you have chosen No Derivatives) modify and use your work for any purpose other than commercially unless they get your permission first.</p>

NGSS Drama (Lithuania)

By Jolanta Švėgždienė, Lithuanian language teacher, Panevėžys "Šaltinis" progymnazium

TITLE OF THE ACTIVITY	IF YOU DO NOT LEARN, YOU WILL BECOME...
AGE GROUP	Students aged 11-12 and seniors
DURATION	2 months
SETTING (OUTDOOR OR INDOOR)	School, students' homes
AIMS OF THE ACTIVITY	To set free children's creativity in interpreting the tale of Pinocchio's Adventures and discuss human rights
DESCRIPTION OF THE ACTIVITY	<p>1. Reading and interpretation of The Adventures of Pinocchio by Carlo Collodi</p> <p>During the lessons of mother tongue students read the book The Adventures of Pinocchio by Carlo Collodi together with their teacher. The first lesson is dedicated to get familiar with the author of the book, the origin of the book, its composition and structure and the main theme of the book. Lessons 2-3 are dedicated to get familiar with the characters, problems of the book and main plot.</p> <p>2. Recognition of the right to education and connection with the history of the origin of rights</p> <p>During the History lesson the history teacher presents the history of schools in the country and highlights the right to education. Students also discuss what other rights they know.</p> <p>3. Production of Pinocchio's portrait during a technology lesson</p> <p>During the technology lesson students produce the portrait of Pinocchio from wood (veneer), they use their imagination</p>

to create the portrait, make measurements, draw and paint it. Later it can be used as decoration or a book stand.

4. Making dolls at home with parents and grandparents and pupils' activities; presenting the work to family members

The theatre teacher gives a lecture on the ways of making puppets. One of the ways to make puppets is puppets made of old socks and gloves using old buttons and other materials. Students have to use their imagination to describe the chosen character. Students choose either the Cat, the Fox, Pinocchio, Romeo, Geppetto or the Cricket. They discuss the sustainability of the puppets. Students make the puppets together with their families at home. Older generation help the young to make puppets. Some students had a needle in their hands for the first time in their life. Also it is a time for families to spend time together. The grandparents have an opportunity to talk about their values in life and their life experience. Students also have an opportunity to present the story of Pinocchio to their grandparents who had only heard a different story in their childhood. Family connections get better this way.

5. Staging of Pinocchio's adventures in the classroom

The teacher of theatre presents the idea of table theatre. Later students act with everything – pens, cups, etc. After that students together with the teacher choose desired scenes of the book which prove that education is a value. The scenario is written together. As the puppets have already been made, the parade of the puppets is organized and students choose the best ones which represent the characters best. They justify their choices. All the students have a chance to try to act, draw decorations or participate in preparations. The best actors are chosen to act in front of the public.

	<p>6. A show to the school community during the event</p> <p>The spectators are school community members: younger students, parents, grandparents, teachers.</p>
<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<p>A book by Carlo Collodi The Adventures of Pinocchio, materials for making puppets (stockings, gloves)</p>
<p>REFERENCES, IF ANY (website – books)</p>	
<p>PICTURES OR VIDEOS UPLOADED</p>	



ICT activities

Information and Communication Technology (ICT) plays a vital role in teaching STEAM (Science, Technology, Engineering, Arts, and Mathematics). Here are some reasons why ICT is important in STEAM education. To begin with, ICT provides students with access to a wealth of information and resources that they can use to learn about STEAM concepts. For example, students can use online databases, interactive simulations, and videos to explore scientific experiments or engineering solutions. Also, ICT enables students to collaborate with peers and experts from around the world. For example, students can use video conferencing and online collaboration tools to work together on projects, share ideas, and receive feedback. ICT provides a platform for students to develop innovative solutions to real-world problems. For example, students can use programming languages to design and build robots, or use design software to create 3D models of structures. ICT provides students with essential digital literacy skills, such as information literacy, media literacy, and digital citizenship. These skills are crucial in a world that is increasingly reliant on technology. ICT skills are in high demand in many STEAM fields. By incorporating ICT into STEAM education, students can develop the skills they need to pursue careers in areas such as software development, data analysis, and digital design. In summary, ICT is an essential component of STEAM education. By providing access to information, facilitating collaboration, promoting innovation, developing digital literacy skills, and preparing students for future careers, ICT can help students become more engaged, confident, and successful learners.

NGSS ICT (Bulgaria)

TITLE OF THE ACTIVITY	CREATE A COMIC STRIP
AGE GROUP	1-4th grades (primary level)
DURATION	45-90 min
SETTING (OUTDOOR OR INDOOR)	Indoor, provide enough space for movement
AIMS OF THE ACTIVITY	<p>Students will:</p> <ul style="list-style-type: none"> understand the basic elements of a comic strip narrative; create a comic strip; develop digital skills like use of Google Drawing, insertion of a table, insertion of elements, resize and format of elements, adding a text.
DESCRIPTION OF THE ACTIVITY	<p>Introduce the lesson- 5 min: Prompt students to think about a story or event for a comic strip. Students are introduced to Google Drawing, how to create a new document, and how to give it a title.</p> <p>Plan the story- 10 min: Students plan the four frames of their comic strip.</p> <p>Set up the drawing- 7 min: Students create and resize a drawing. They also insert a table and format it for their comic strip.</p> <p>Draw the comic-12 min: Students add the basic elements of character, setting, and objects to their comic strip.</p> <p>Add Your Characters' Words and Thoughts- 6 min: Students add speech and thought bubbles for characters.</p> <p>Act out the comic- 10 min: Give the groups the opportunity to act out their comic story in front of the rest of the class. In</p>

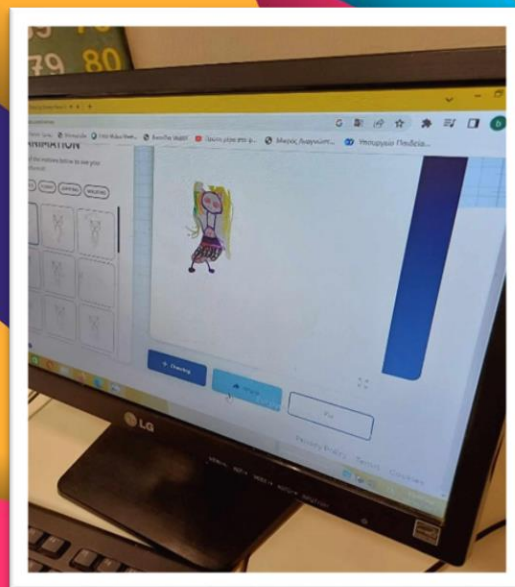
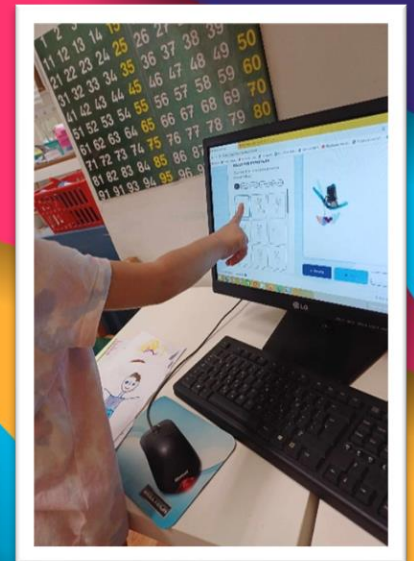
	<p>order to keep the rest of the students engaged, some follow-up questions could be prepared and asked at the end of each performance.</p> <p>Create a Comic Strip Wrap-Up- 5 min: Give a short closing and facilitate brief discussion about what students learned and experienced. Students wrap up the lesson and discover how the skills they learned can apply to other tasks.</p> <p>Walk around the class and monitor progress to ensure students:</p> <ul style="list-style-type: none"> - Open a comic strip planning document and rename it. - Write out the four frames of their comic strip in the document. - Create a drawing, resize it, insert a table, and format it for their comic strip. - Add characters, settings, and objects to their comic strip. - Add speech and thought bubbles to their characters <p>Tips: Instead of Google Drawing, the program Paint can be used or any other drawing app.</p> <p>The story can be from a History lesson or from the Literature class.</p>
<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<p>Computer with internet access (per student)</p> <p>Headphones (per student)</p> <p>Paper and drawing materials (pencils, crayons, etc.)</p>
<p>REFERENCES, IF ANY (website – books)</p>	<p>The lesson is from https://applieddigitalskills.withgoogle.com/c/middle-and-high-school/en/create-a-comic-strip-in-google-drawings/overview.html</p>

NGSS ICT (Greece)

By Vasiliki Giannakou, kindergarten teacher, 7th kindergarten Rethymno, CRETE

TITLE OF THE ACTIVITY	ANIMATE YOUR DRAWING
AGE GROUP	4-6
DURATION	40 min
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	Students are expected to learn how to use a computer program to complement their inquiries in the topic: “my body”
DESCRIPTION OF THE ACTIVITY	<p>Important Steps</p> <p>Children:</p> <ol style="list-style-type: none"> 1) examine books of information to build their knowledge about the main parts of human body 2) record their observations 3) each child makes his own drawing and takes a photo of it <p>Then, children upload their photos to the computer and start to use the online platform “sketch.metademolab”. This platform can animate characters.</p> <p>Children can choose one of the moving options to see their character perform it.</p> <p>Through trial and error, they check if their character/drawings have all the parts of a human body. If the character doesn’t have legs or arms, the teacher can pose questions: Which parts of the body are missing? Which need to be filled in? What can we do?</p>
MATERIALS/RESOURCES/TECHNICAL	https://sketch.metademolab.com/canvas

REQUIREMENTS	
REFERENCES, IF ANY (website – books)	
PICTURES OR VIDEOS UPLOADED	



NGSS ICT (Romania)

Mariana Iulia Pitiş, Preschool Education Teacher, Kindergarten no.13 of Targoviste

TITLE OF THE ACTIVITY	THE VERY HUNGRY CATERPILLER – THE PROJECT COLBY THE MOUSE ON THE VERY HUNGRY CATERPILLER TRACKS
AGE GROUP	preschoolers aged between 4 to 5 years old
DURATION	25 minutes
SETTING (OUTDOOR OR INDOOR)	INDOOR
AIMS OF THE ACTIVITY	<ul style="list-style-type: none"> ● To learn simple steps of programming and coding: <ul style="list-style-type: none"> - creating the route of The Very Hungry Caterpillar, using the green grids; - programming the Colby mouse, using the colourful buttons; ● To learn the counting from 1 to 5; ● To learn the days of the week in the right order;
DESCRIPTION OF THE ACTIVITY	<p>Steps of the activity:</p> <ol style="list-style-type: none"> 1. The preschool children watch the short movie The Very Hungry Caterpillar by Eric Carle (this is a science story about the life cycle of the caterpillar), or listed the teacher reading/telling the story, while 2. The teacher/teacher`s help set up the STEAM Colby mouse coding activity – On The Very Hungry Caterpillar tracks. Then, 3. Preschoolers built the route by placing the green maze grids on the work table. 4. Once the maze is built, they engage in digging in the sand box to discover the illustrated story cards featuring vegetables and fruits (that were hidden in the sand). The preschoolers put the fruit and vegetable cards on the tracks in the order in which they appear in the story. Then,

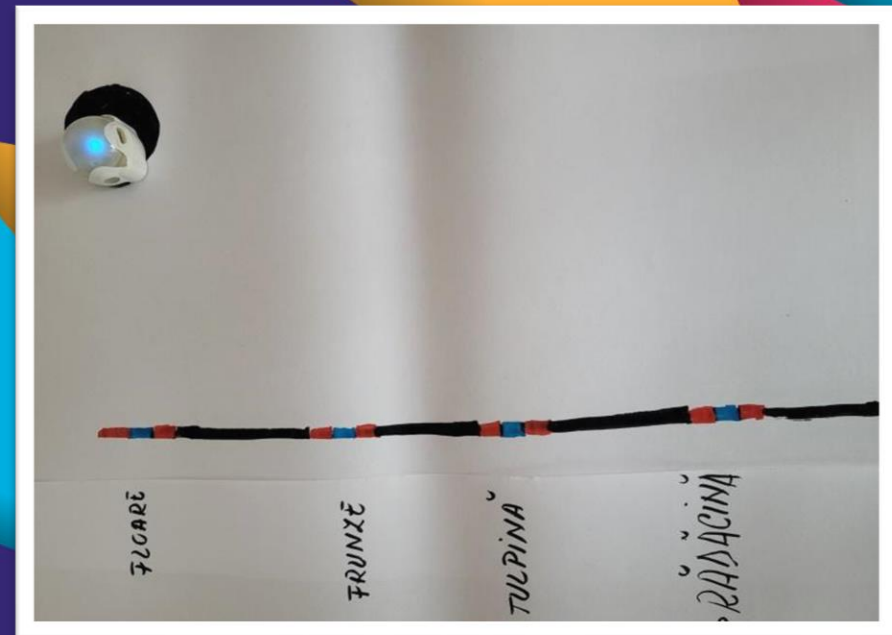
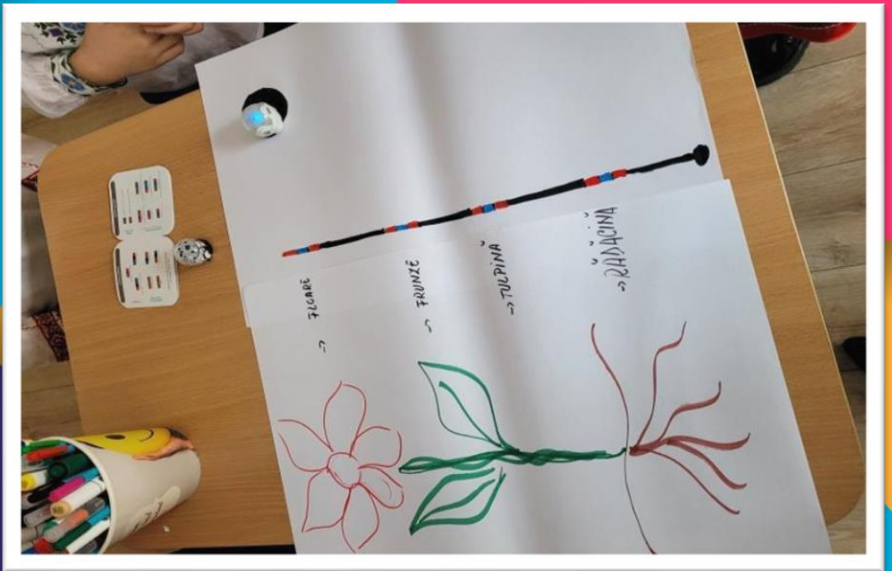
	<p>5. The preschoolers program the Colby mouse to reach The Very Hungry Caterpillar; when doing that, they can number the cards from one to five, as well as the days of the week.</p> <p>6. At the end, the preschoolers recreated (paint) the caterpillar with fruits and vegetables using the imprinting technique (they used some fruits/vegetables, or parts of them to put the watercolours on the paper, to obtain the body and had of the caterpillar).</p>
<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<ul style="list-style-type: none"> ● The very hungry caterpillar – animated movie (resource) https://www.youtube.com/watch?v=75NQK-Sm1YY ● STEAM game – Colby robot (the Colby mouse, green cards) ● Food Cards with fruits and vegetables ● Real fruits and vegetables
<p>REFERENCES, IF ANY (website – books)</p>	<p>The book “The Very Hungry Caterpillar”, by Eric Carle;</p> <p>The video of the story: https://www.youtube.com/watch?v=75NQK-Sm1YY</p>
<p>PICTURES OR VIDEOS UPLOADED</p>	<p>https://www.canva.com/design/DAFTNhClmF8/lg1EZJGnxGC_HZQKu_iC-Tg/view?utm_content=DAFTNhClmF8&utm_campaign=designshare&utm_medium=link&utm_source=homepage_design_menu</p>

NGSS ICT (Romania)

By Mihaela Predoi, Primary Education Teacher, "Mihai Viteazu" Secondary School
Târgoviște

TITLE OF THE ACTIVITY	OZO AND PLANTS
AGE GROUP	6-7 years (preparation class in primary school) System)
DURATION	10 minutes
SETTING (OUTDOOR OR INDOOR)	Indoor (classrooms)
AIMS OF THE ACTIVITY	Children will consolidate information about parts of a plant and will exercise coding abilities
DESCRIPTION OF THE ACTIVITY	<p>This ICT activity is part of a larger learning activity about plants, respectively the systematization and consolidation of children`s knowledge. I used the Ozobots to make the activity more attractive and engaging for the children. So, I coded, using markers, a path for our little Ozobot. Children learn the code for STOP (red-blue-red) and draw it on a paper.</p> <p>Each time when Ozobot stopped, they have to name the part of the plant and say all they know about it.</p> <p>Here are the steps of this activity:</p> <ol style="list-style-type: none"> 1. I presented them with the OZO the Robot (Ozobot). 2. I told them that he walks on a drawing made with the 4 colors. For each of his actions there is a color code. 3. Because I was only interested in him going straight and stopping, I only taught him these codes: go - black, stop - red, blue, red 5. I drew a plant on an A3 sheet and next to it the path for the

	<p>Ozobot.</p> <p>6. Ozobot was programmed to stop at each part of the plant</p> <p>7. At each stop, the children named the part and said everything they knew about it</p>
<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<ul style="list-style-type: none"> • Paper • Markers • Ozobots
<p>REFERENCES, IF ANY (website – books)</p>	
<p>PICTURES OR VIDEOS UPLOADED</p>	



NGSS ICT (Turkey)

by ULAŞ GÜVEN YİRMİBEŞ (EN)

ACTIVITY / LESSON TITLE	CHICKEN ACTIVITY
TARGET GROUP	It is a plan prepared for the children aged 10 or 11 (4 th or 5 th grade)
DURATION	<p>Stage 1: Empathize—Research Your Students' Needs. (10 minutes)</p> <p>Stage 2: Define—State Your Students' Needs and Problems. (30 minutes)</p> <p>Stage 3: Ideate—Challenge Assumptions and Create Ideas. (40 minutes)</p> <p>Stage 4: Prototype—Start to Create Solutions. (40 minutes)</p> <p>Stage 5: Test—Try Your Solutions Out. (40 minutes)</p>
LEARNING ENVIRONMENT	Indoor
STEAM & SEL ³ Competences	<input type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy <input type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation

³ More information on Social and Emotional Competences:

<https://drive.google.com/file/d/1Ao3gc4VEuBFE1LgVrSx-dRBIK1ABa3nX/view?usp=sharing>

	<ul style="list-style-type: none"> <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Integrity <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy <input type="checkbox"/> Confidence & Assertiveness
<p>EXPECTED LEARNING OUTCOMES</p>	<p>Students learn the flexibility of the objects and how they can move without battery or electricity.</p> <p>Students can be aware of the energy transformation.</p> <p>Students can suggest solutions to the problems in daily life.</p> <p>Students learn to follow the process.</p> <p>This plan ensures the development for the students not only on the cognitive field but also on the language, social and emotional fields; students</p> <ul style="list-style-type: none"> ✓ Develop the skills of decision making. ✓ Connect with daily life and what they've learned ✓ Give samples from the daily life

	<ul style="list-style-type: none"> ✓ Express themselves in creative ways. ✓ Improve their communication skills. ✓ Respect different opinions. ✓ Defend their opinions democratically
<p>SUBJECTS AND TOPICS COVERED</p>	<p>Subject: Science</p> <p>Learning field: Energy</p> <p>Topic: Flexible moving objects</p>
<p>METHODOLOGIES</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Design Thinking <input type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori 3-stage lesson
<p>TOOLS / MATERIALS / RESOURCES</p>	<ul style="list-style-type: none"> ✓ 2 paper cups ✓ rubber bands ✓ coloured cardboards ✓ 1 waste battery ✓ scissors ✓ tape
<p>DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS</p>	<p>Stage 1: Empathize—Research Your Users' Needs. (10 minutes)</p> <p>Students are grouped. The teacher gives each group elastic bands and suspension equipment in order to make the students examine. The teacher asks the students where and how this equipment is used or can be used.</p> <p>The old clock is shown on the smart board. The teacher states that electricity or batteries are not used in the periods when these old clocks were used. In this way, the students begin to think these</p>

instruments can be used well without electricity or batteries. This is the first crucial step for the students.

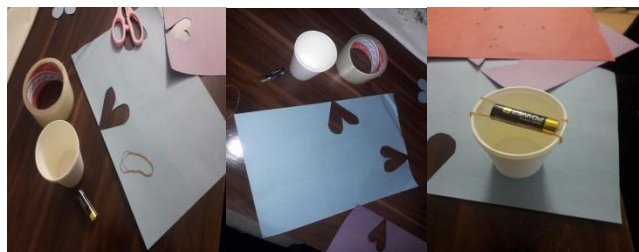
Stage 2: Define—State Your Users' Needs and Problems. (30 minutes)

The students are asked to produce ideas in the library or using computers and videos to find out how these old clocks can work. The teacher gives students enough time to find out the answer of this question the teachers allows the students to acquire experience and discover the reason of the movement of these objects without batteries and electricity. They squeeze and tighten the elastic bands and suspension equipment in order to discover the new experiments to find out the answer of the question.

Stage 3: Ideate—Challenge Assumptions and Create Ideas. (40 minutes)

The students brainstorm the results they have obtained during the definition process in the classroom. The students are asked to examine how the clockwork toys move so the students begin to establish a connection with the working order of the old clocks and the clockwork toys. After the teacher asks the questions in order to make the students structure the scientific concepts, the teacher expresses the flexible potential energy concepts and flexible objects. The teacher gives examples from daily life.

Students are asked to design a moving chicken by giving a rubber band, battery, 2 cardboard cups and tape.





Stage 4: Prototype—Start to Create Solutions. (40 minutes)

The teacher distributes various materials as elastic bands, batteries, 2 carton cups, colourful cartons to the groups. The teacher asks the students to create a moving animal object (a chicken model) using the flexible objects and their acquired knowledge they have obtained in the group work. The students negotiate the new terms, definitions, information they have just learned and reach a consensus to compose a prototype as a chicken model. The students are expected to design a chicken model with the materials the teacher has distributed in order to reflect their new acquired knowledge about the subject. The teacher observes the students while they are dealing with the problem and asks the students open-ended questions.

Stage 5: Test—Try Your Solutions Out. (40 minutes)

This step is not the last step however; it should be applied in each step. The teacher asks the students to give their feedback about the prototypes (the solutions) they have developed but at the same time, it's an opportunity to gather further knowledge about the students 'needs. The results obtained in this stage are often used to redefine problems and to modify and refine your prototypes, in a circular process that should finally end with the solution that works well for the students in that context.

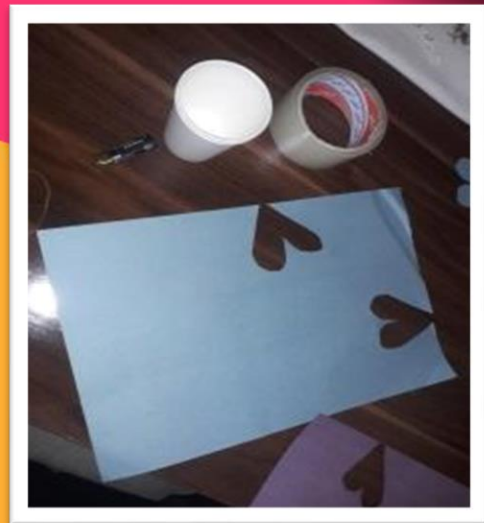
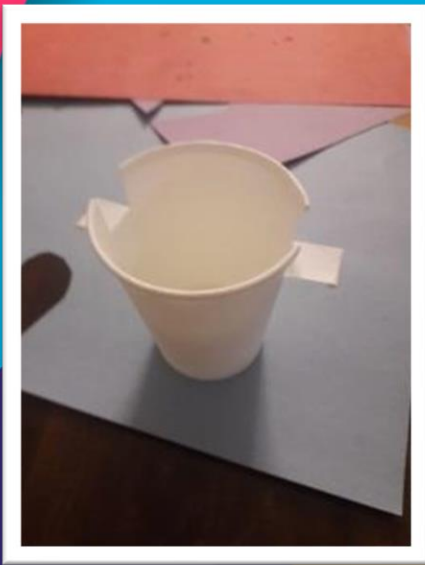
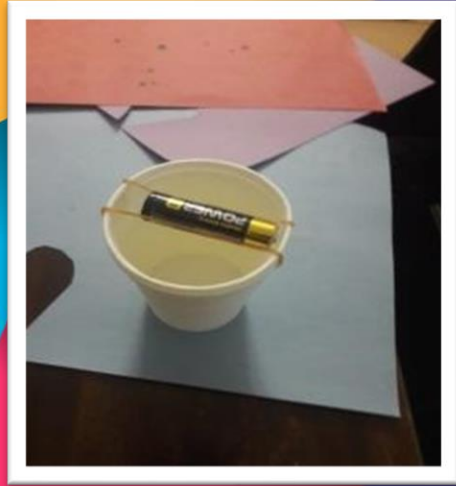
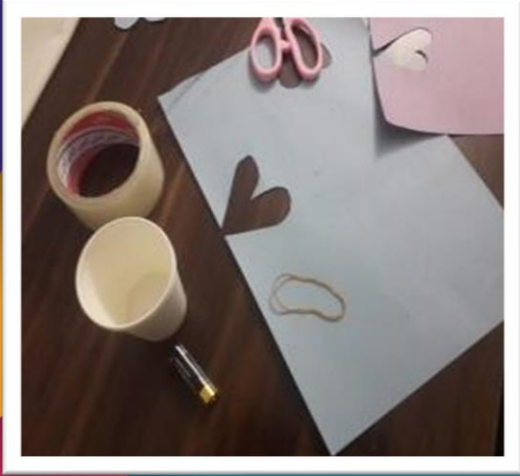
INTEGRATION OF ART

Based on the Design Oriented Approach, this unit will cover the following stages: exploring, interpreting, generating ideas, designing, transforming their designs into three-dimensional works.


Students' autonomous working:

- ✓ The student can use their imagination

	<p>✓ The student can review his /her observation, knowledge and experiences related to the negotiated subject during the discussion process.</p> <p>Performance indicators:</p> <p>✓ The student carries through the thinking process effectively.</p> <p>✓ The student improves his / her communication skills while expressing his / her ideas and listening to his / her friends.</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>You can create study groups as mixed girls and boys. While students are designing, be careful not to direct them to stereotypes for boys and girls. Creating new products and revealing original ideas by using their creativity are our priorities during the activities.</p>
<p>FEEDBACK & ASSESSMENT</p>	<p>Assessment activities must provide evidence about students' learning process as well as learning outcomes. Formative and summative evaluation techniques will inform teachers both about students' learning and quality of overall experience. So how much the accusation of theory of the subject is defined using the Kahoot test. The experiment is evaluated by the rubrics prepared.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>Result and Evaluation (20 minutes)</p> <p>Students realize self-evaluation using a cumulative sum chart.</p> <p>As teachers focus on both process and product evaluation students will find opportunities to identify problems, make plans, keep track of thinking, reflect on progress, make improvements, and synthesize thinking. (Nicol & Macfarlan, 2006)</p>
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>NonCommercial (nc)</p> <p>You let others copy, distribute, display, perform, and (unless you have chosen No Derivatives) modify and use your work for any purpose other than commercially unless they get your permission first.</p>



NGSS ICT (Turkey)

TITLE OF THE ACTIVITY	CODE YOUR MAP
AGE GROUP	5-6 Years
DURATION	40 min
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	<p>Students are expected to construct their house's environment map and writing codes to reach expected places around their houses.</p> <p>Constructing and algorithm to follow to go a certain place around their house.</p>
DESCRIPTION OF THE ACTIVITY	<p>Firstly, students are expected to draw a map of the environment of the house. Map should be constructed with the small unit squares in order to move. After that they are told to construct movements to get from house to another place around their houses.</p> <p>For example: Move 3 step right and move 2 step up to go to the market.</p> 

	<p>After getting know and feeling about a simple algorithm using maps we page code.org is opened and asked to do implementation.</p> <p>https://game.rodocado.com/hour-of-code/</p>
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	A4 Paper , coloured pens, computer,



THE EXAMPLES OF GOOD PRACTICES

Evaluation rubric of material

NO	CRITERION	2 POINTS	1,5 POINTS	1 POINT	0 POINTS
1	The presentation of the educational material follows the 4:11 PMNGSS template	The presentation of the educational material COMPLETELY follows the NGSS template	The presentation of the educational material LARGELY follows the NGSS template	The presentation of the educational material PARTIALLY follows the NGSS template	The presentation of the educational material DOES NOT follow the NGSS template AT ALL
2	The subject and objectives of the material addresses the level of the target group	The subject and objectives of the Material COMPLETELY addresses the target group level	The educational material is SUFFICIENTLY suitable	The educational material is PARTIALY suitable	The educational material IS NOT AT ALL suitable
3	The educational material is suitable for the STEAM methods/strategies	The educational material is COMPLETELY suitable	The educational material is SUFFICIENTLY suitable	The educational material is PARTIALY suitable	The educational material IS NOT AT ALL suitable
4	Presenting art activities within STEAM applications in the material	The MATERIAL FULLY includes art activities within the STEAM applications	The MATERIAL SUFFICIENTLY includes art activities within the STEAM applications	The MATERIAL PARTIALLY includes art activities within the STEAM applications	The MATERIAL does NOT AT ALL include art activities within the STEAM applications
5	The educational material is sustainable (it uses natural and/or recyclable materials, its production costs are low, it can be reused or used for several purposes)	The educational material is COMPLETELY sustainable	The educational material is SUFFICIENTLY sustainable.	The educational material is PARTIALLY sustainable.	The educational material IS NOT sustainable at all.
EXTRA POINTS		ORIGINALITY OF THE LESSON PLAN +2 POINTS			

Evaluation rubric of lesson plan

NO	CRITERION	2 POINTS	1,5 POINTS	1 POINT	0 POINTS
1	The LP follows the NGSS template	The LP COMPLETELY follows the NGSS template	The LP follow LARGELY the NGSS template	The LP PARTIALLY follows the NGSS template	The LP DOES NOT follow the NGSS template
2	The LP addresses STEAM education (it contains specific methods and steps suitable for STEAM education)	The LP COMPLETELY addresses STEAM education	The LP SUFFICIENTLY addresses STEAM education	The LP PARTIALLY addresses STEAM education	The LP DOES NOT address STEAM education
3	The LP objectives and content is suitable for the target group (is adequate for the age group)	The LP objectives and content is COMPLETELY suitable for the target group	The LP objectives and content is SUFICIENTLY suitable for the target group	The LP objectives and content is PARTIALLY suitable for the target group	The LP objectives and content is NOT AT ALL suitable for the target group
4	The LP activities includes all pupils, addressing gender disparities or other disparities	The LP activities COMPLETELY includes all pupils, addressing gender disparities or other disparities	The LP activities SUFFICIENTLY includes all pupils	The LP activities PARTIALLY includes all pupils, and addressing PARTIALLY gender disparities or other disparities	The LP activities DO NOT include all pupils, DO NOT address gender disparities or other disparities
5	Adequacy of the implementation time of the lesson plan content	The implementation time of the LESSON PLAN content is COMPLETELY adequate	The implementation time of the LESSON PLAN content is SUFFICIENTLY adequate	The implementation time of the LESSON PLAN content is PARTIALLY adequate	The implementation time of the LESSON PLAN content is NOT AT ALL adequate
EXTRA POINTS		ORIGINALITY OF THE LESSON PLAN +2 POINTS			

NGSS PROJECT STEAM LESSON PLAN & EDUCATIONAL MATERIALS DESIGN CONTEST

The winners

NGSS Lesson Plan (Lithuania)

By Asta Sakalienė, Panevėžys “Viltis” progymnazium, Lithuania

ACTIVITY / LESSON TITLE	GETTING TO KNOW THE CULTURE AND RECREATION PARK
TARGET GROUP	<p>Target group: 3-4 graders.</p> <p>Students must have completed at least two grades in the general curriculum of primary education to be able to independently complete the tasks of this activity.</p> <p>If the students have not had the opportunity to use a map of the area, orient themselves on it, if they have not learned how to complete tasks on the Padlet board with a mobile phone, scan a QR code, determine GPS coordinates on Google Maps, if they do not know how to take a screenshot on a mobile device, do not have a pedometer program installed, individual help from the teacher or prior preparation is required.</p> <p>By adding more challenging tasks, the activity plan can also be used in older grades (grades 5-8).</p>
DURATION	On average, the activity can last around 3-3.5 hours. The duration of the activity depends on the knowledge and abilities

	<p>of the students in various subjects, the pace of work, group work and digital literacy skills.</p>
<p>LEARNING ENVIRONMENT</p>	<p>The activity takes place outdoors - in the Panevėžys Culture and Recreation Park (https://goo.gl/maps/7FCoMozQXi99uz4w6) at any time of the year, but if there is heavy rainfall, it is recommended to postpone the activity to another day.</p>
<p>STEAM & SEL COMPETENCES</p>	<p>Knowledge of the natural world, mathematical language and numeracy, spatial thinking, digital literacy, communication and collaboration, information management skills, problem solving, creative thinking, responsible decision making, confidence and perseverance, curiosity.</p>
<p>EXPECTED LEARNING OUTCOMES</p>	<p>Working in cooperative groups, using the map of the Culture and Recreation Park students will visit 8-9 objects and independently perform at least 18-25 tasks correctly in 2 hours.</p>
<p>SUBJECTS AND TOPICS COVERED</p>	<p>The following subjects are integrated in the activity, the topics indicated in brackets are analyzed:</p> <ol style="list-style-type: none"> 1. Lithuanian language (providing answers in complete sentences, following spelling and punctuation requirements, creating an advertising slogan). 2. Mathematics (arithmetic operations up to 1000, measurements, angles, geometric figures, three-dimensional bodies, radius of a circle). 3. Knowledge of the world (map of the area, directions of the world, trees and their properties, properties of materials, sustainability, concepts of "modernization", "amphitheatre", professional guidance). 4. Art and technologies (constructive materials of objects, their properties, monitoring the environment of everyday life, generation of sustainable creative ideas, benefits for people and the environment).

	<p>5. Physical education (orientational walking, sports - disc golf, volleyball).</p> <p>6. Information technologies (searching for information, presenting it in text, video and audio recordings, photos, drawings, using apps, typing text in Lithuanian characters).</p>
METHODOLOGIES	<p>Problem-based/experiential learning is organized - active self-learning cognitive activity that interacts with educational content, helps actualize previous knowledge and experience, acquire new knowledge and activity methods (e.g. using help of a group of friends or "Call" (to mother, father, grandparents, etc.), harmonious cooperation in a group to perform a practical measurement, calculation or creative task, to find the answer on the Internet, on a map, on a stand). Working in small (3-4 students) heterogeneous groups, students discover unknown things, process information, understand the importance of cognition. The student's thinking is guided by problematic and informational questions that show the essence of the educational problem and the area of knowledge search that is not yet known to the student. The activity is organized like a challenge game "Escape Room" (travelling from stop to stop): students have to think, develop observation, curiosity, creativity, adaptability to different situations, it is necessary to prove that the group is able to solve all the surprises together, but it is emphasized that quality of task completion is more important than speed. The teacher is a helper, facilitator (helps to understand the goals of the activity and to achieve them, he does not directly participate in this activity, but virtually observes its results).</p>
TOOLS / MATERIALS / RESOURCES	<p>Each group needs the following tools to complete the tasks:</p> <p>1. Map for each student with marked stops (A3 size, paper, color, same for all groups) https://drive.google.com/file/d/1A3T7TCisKGdZdDvDXsR4ah7qbMoeOdwd/view?usp=sharing</p> <p>2. Copy of QR code pinned to the group map (different QR code for each group - link to Padlet board)</p>

<https://drive.google.com/file/d/1eE9Ui7-XtdUjtRNgcUur1CXvBOM5wjrc/view?usp=sharing>

3. A folder with worksheets (a paper version is needed in case of Internet connection problems, and some children prefer to read on a worksheet than on a mobile device; it is recommended to give the worksheets to each student, then they have individual answers that they discuss with the group members before filling in the answers on the Padlet board)

<https://drive.google.com/file/d/1x2ql71uSedlkakwqL3TgrV8N8D7-2m8f/view?usp=sharing>

4. A mobile device with internet, QR code scanner, selected pedometer program

5. Pen

6. Roulette

Students read the tasks and post the answers to their group's Padlet board, for example: <https://padlet.com/sakasta/s0jxkjejxa3vskmy>. Information can be uploaded by one group member, but other group members can also provide answers; it depends on how many students in that group have mobile devices and how the students divided responsibilities.

Students can search for information and clarify facts using the browser on the mobile device.

The following Internet resources are used to create tasks for this activity:

1. <https://padlet.com/> (The teacher must create as many Padlet boards as many groups there are. Students read tasks on them, give answers in various formats (image, sound, text, drawing). During the activity, the teacher can analyze the groups' Padlet board answers and provide written recommendations to the students "here and now", ask additional questions, ask to clarify the answer, etc.).

	<p>2. https://www.qr-code-generator.com/ (there may be other tools for creating QR codes) (The teacher downloads the generated QR code on the Padlet board or encodes the web addresses of each group's Padlet board in the app, cuts out the codes and attaches them to the group map).</p> <p>3. https://www.google.com/maps (This link is given to students in an exercise that asks them to determine the GPS coordinates of a location).</p> <p>4. Any pedometer app, e.g. Walk15 (https://play.google.com/store/apps/details?id=de.walk15.pedometer&hl=lt&gl=US), Huawei Health (https://consumer.huawei.com/lt/mobileservices/health/).</p>
<p>DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY</p>	<p>Students gather at the agreed time in the Culture and Recreation Park near the fountain.</p> <p>Start of activity (30 min).</p> <p>Students are asked to guess what we will do this time in the Culture and Recreation Park (activities are organized in the park not for the first time), at the same time they try to name what the topic of the lesson (activity) could be (presented in line 1 of this table), formulate the goal.</p> <p>The teacher briefly presents the activities (how many stops will be visited, how many tasks will be completed), introduces the task of the activity (presented in line 6 of this table), discusses what help can be used (e.g. search on the Internet, at the stand, help of the "Call"), informs, that the answers should be numbered and presented in complete sentences, introduces the evaluation and self-evaluation forms (presented in lines 13 and 14 of this table).</p> <p>The teacher makes heterogeneous groups of 4 students each (taking into account students' abilities, cooperation skills, available mobile devices). Students divide responsibilities (e.g., responsible for reading the map, assignments, providing answers (if all group members have mobile devices, one student can</p>

upload textual information, another - audio recordings, the third - videos, the fourth - photos and drawings) to the Padlet board task), tracking time, tracking teacher's comments, correcting errors). As a reminder, individual responses are important, but group decisions are recorded on the Padlet board.

The tools are distributed (presented in row 9 of this table), students check whether they have a QR code scanner, pedometer apps on their mobile device, whether mobile data and location are enabled. It is checked whether the students remember how to upload information in various formats to the Padlet board.

The requirements for safe behavior near the river, source, observation deck, on the bridge, near the street are discussed. It should be noted that the paths are separated by a continuous line for pedestrians and cyclists (remember the sign), so you need to walk only on the side intended for pedestrians. Asks to check if all students have the teacher's phone number, informs in which cases they should call.

Activity (2 hours).

Each group scans the QR codes with their mobile devices (<https://drive.google.com/file/d/1eE9Ui7-XtdUjtRNqCuur1CXvB0m5wjrc/view?usp=sharing>) to access their Padlet board (<https://padlet.com/sakasta/s0jxkjejxa3vskmy>).

First, the students familiarize themselves with the information provided in the "Attention!" section of the Padlet board, remember the task of the activity, set and write down the group's expectations.

Students, cooperating in groups, perform tasks independently: analyze the map (<https://drive.google.com/file/d/1A3T7TCisKGdZdDvDXsR4ah7qbMoeOdwd/view?usp=sharing>), orient themselves according to the map and travel to the necessary objects in a row (from 1 to 9 stops), at each stop, they perform tasks, answer questions based

	<p>on their knowledge or using various aids, record them on the Padlet board in the specified forms.</p> <p>Students monitor the teacher's ratings ("Like", "Dislike"), read comments, see if the teacher has asked for correction, and if necessary, correct the answers.</p> <p>The teacher can travel with the students and observe how the students are doing in the tasks. However, if the students are not visiting the park for the first time, the teacher can wait for the students at the agreed place and observe the work done by the students virtually (on the Padlet board).</p> <p>End of activity (30 min).</p> <p>When all the groups return to the agreed place, the answers are checked (https://drive.google.com/file/d/1ri84JDbhr_4O0d9b--pilCzIXFTj70IX/view?usp=sharing).</p> <p>Students fill in the "Reflection" section on the Padlet board independently (draw the emotion of the group, upload a photo of the pedometer app, answer the questions (provided in line 13 of this table)). The group representative(s) present the self-assessments to everyone.</p> <p>The teacher summarizes the activities of all groups, returns to the task of the activity, evaluates the work done by the groups, is happy with the results obtained, expresses observations, and provides individual feedback to the students as needed.</p> <p>After organizing the work equipment, return to the school on foot (about 3 km).</p>
<p>INTEGRATION OF ART</p>	<p>The activity description includes tasks that integrate the arts (art and technology).</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR</p>	<p>Quality education is ensured for every child, regardless of their gender, family socio-economic environment, place of residence, nationality, special educational needs, etc.: appropriate</p>

<p>INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>tasks are prepared (oriented to the students' age, abilities, available experience, individuality, associated with larger expectations), expected methods and methods (heterogeneous grouping of students, cooperative learning, solving problems together, good mutual relations, compliance with rules and agreements, incentive system), material and human resources are planned (inclusive modern tools are used, timely assistance is provided), responsibility is developed for their own learning, independence is encouraged, opportunities are created for each student to receive feedback, self-evaluation, and predict further steps of development.</p>
<p>FEEDBACK & ASSESSMENT</p>	<p>Formative assessment is applied during the activity (on the Padlet board, the teacher marks "Like" (correctly performed task) and "Dislike" (incorrectly performed task) under each answer, if necessary, provides comments/suggestions to eliminate gaps - this is how students are encouraged and allowed to correct themselves.</p> <p>At the end of the activity, students themselves are given the right to participate in the self-evaluation procedure. After drawing the emotion of the group, the students answer the questions below in writing, and later present the answers orally to everyone:</p> <ol style="list-style-type: none"> 1. What was easy and difficult? 2. How did working in the group go (individual contribution of each member, agreements, help, performance of tasks)? What would you do differently next time? 3. The most interesting and most disliked task... 4. Will you use the knowledge and abilities acquired today in your life? Give examples. 5. How many tasks did you get right? 6. What support did you use? 7. Did you fulfill the expectations of your group? Explain why.

	<p>In the course of the activity, the students' learning is monitored and discussed at the end by individualizing not only the subject, but also the feedback of social abilities and interpersonal relationships, showing learning successes and gaps, helping students to achieve more.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>The electronic diary records on how the activity task was accomplished while working in the group (taking into account the evaluation criteria and set expectations), describes successes and difficulties, sends links to the students' work (Padlet board) - thus accumulating information about the students' learning in the educational process.</p>
<p>WAS IT IMPLEMENTED/ TESTED OR NOT? IF YES, PLEASE EXPLAIN THE PROCESS (DURATION OF THE IMPLEMENTATION, GRADES, PROCESS)</p>	<p>This activity was carried out September 9, 2022, with 3rd grade students, as well as with 7th grade students. The third graders covered about 3 km and the seventh graders about 5 km during the tasks (they had to visit more stops and complete tasks for their age). The activity lasted 3 hours. (familiarization with the purpose of the activity, task, assessment and self-evaluation, division into groups and responsibilities, briefing on safe behavior, distribution of tools - 30 min, setting expectations, independent work in groups - 2 hours, summarization, discussion of connections with life and reflection - 30 min).</p> <p>Moments of activities Moments (obtained parental consent for photography and photo sharing): https://drive.google.com/drive/folders/1Go-rABHOjdToX08ouXNGxm6Zu4YGCQbsJ?usp=sharing</p> <p>On September 28, 2022, the activity was presented during the organization of the 13th grade lesson for primary school teachers and 5-7 grade teachers in the city of Panevėžys. Educators became students and completed tasks while working in groups. It can be seen from the teachers' reflections that the tasks were interesting, engaging, motivating, clear, understandable, corresponding to the age and abilities of the students. The most difficult thing for teachers was to "make friends" with technology.</p>

<p>IF YES, WILL YOU PLEASE WRITE YOUR REFLECTION/ EVALUATION? (CONSTRAINTS ABOUT THE TIMING, MATCHING THE OBJECTIVES ETC.)</p>	<p>All students successfully implemented the activity task, some groups exceeded their own expectations. All groups made mistakes when answering questions and performing practical tasks. When summarizing the activities, the students named various reasons, for example, they did not read the task carefully, they rushed, they guessed the answer, but they could have checked on the Internet, they did not use the help of the call. It is nice that the students worked harmoniously in work groups and responded to the teacher's assessments on the Padlet board.</p> <p>This action plan is a guideline only. Tasks can be changed, made more difficult or easier, reduced or allocated more. It is possible to perform activities without defining the duration of tasks. Then, having completed all the tasks faster, the students can spend their free time on the playground. Alternatively, the group can be divided and the students can be sent as mentors to other groups (the teacher can see on the Padlet board which group is performing the given task, so he can send the students to the right station). Then the task checking and discussion would take place after all the groups return to the agreed place.</p> <p>It is recommended to check the answers, to find out things that are not understood and to reflect for everyone together once again going around all the stops.</p>
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>The activity was based on a map created by Algirdas Šalkauskas (Orienteering Sports Club "Oriens" in Panevėžys).</p> <p>Photos from a personal archive and from the Internet:</p> <ol style="list-style-type: none"> 1. Culture and recreation park https://www.pst.lt/remote/direct_uploads/1600693556_maz_DJI_0383-Edit-2.jpg 2. Source https://projektai.panevezys.lt/wp-content/uploads/2017/04/9576_G_Kartanas-e1573569136974.jpg



3. Observation deck

<https://s1.15min.lt/images/photos/2018/11/09/original/image-01-5be57e3d0329c.jpg>

4. Sakuras https://aina.lt/wp-content/uploads/2022/04/Sakuros_zydi_G_Kartanas.jpg

I allow the created activity to be used in the learning process for educational educational purposes.

I agree to publish the action plan on the NGSS project website <https://ngss.erasmus.site>.

NGSS Lesson Plan (Greece)

By Georgia Katsavidaki, kindergarten teacher, Rethymno, Crete, Greece

ACTIVITY / LESSON TITLE	MATERIALS THAT SINK AND MATERIALS THAT FLOAT IN WATER
TARGET GROUP	<p>Age of children / students: 4.5-6 years.</p> <p>Education level: pre-school education.</p> <p>Special group characteristics: Our group consists of several toddlers, some bilingual children, one child who does not speak Greek at all, as well as two particularly gifted children, with very high intelligence, on the spectrum of pervasive developmental disorders.</p>
DURATION	<ul style="list-style-type: none"> 20 minutes (discussion, questions and hypotheses) 30 minutes of children experimenting with materials 15 minutes recording of results/discussion 20 minutes (art)
LEARNING ENVIRONMENT	Indoor
STEAM & SEL COMPETENCES	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy

	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input checked="" type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Confidence & Assertiveness <input checked="" type="checkbox"/> Collaboration <input type="checkbox"/> Integrity <input type="checkbox"/> Curiosity <input type="checkbox"/> Empathy
<p style="text-align: center;">EXPECTED LEARNING OUTCOMES</p>	<p><i>What kids / pupils are supposed to learn/ develop through this activity / lesson?</i></p> <ul style="list-style-type: none"> ● To experiment with various materials and objects. ● To make assumptions. ● To observe. ● To communicate. ● To ask and answer relevant questions. ● To cooperate and make decisions. ● To create artifacts
<p style="text-align: center;">SUBJECTS AND TOPICS COVERED</p>	<p>Language, mathematics, science, art</p>
<p style="text-align: center;">METHODOLOGIES</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Design Thinking <input checked="" type="checkbox"/> Inquiry Based Learning <input checked="" type="checkbox"/> Problem Based Learning

	<input type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori 3-stage lesson
TOOLS / MATERIALS / RESOURCES	Materials: 4 basins with water, plastic shapes, wooden blocks, wooden and plastic pegs, metal, plastic and wooden spoons, plastic ribbons, rubber animals, etc., paper, camera.
DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS	<ol style="list-style-type: none"> 1. The activity started with a conversation between the students on the trips they had recently. One of the students mentioned that he had travelled on a ship to Athens. One of the other students wondered how it is possible for the ships to float and not sink. The teacher then asked the students if they knew what the ships were made of and how they could answer their classmate's question. 2. We decided to do experiments with different materials and the children were divided into 4 groups. Each group had a basin of water and objects of various materials (plastic, wood, paper, metal, Styrofoam, rubber, etc.), placed them in the water, drew conclusions and made recordings. 3. They noticed that the wooden materials, despite their weight, float in the water. Then they came to the conclusion that since ships (boats) are made of wood they don't sink and they answered the question about the ships.
INTEGRATION OF ART	<p>After completing the activity and making their observations, they wiped the wet objects (plastic shapes, wooden blocks, pegs, plastic ribbons, plastic animals, etc.) with paper. Then, each group composed a piece of artwork with the materials they had available and presented it to the other groups. One student from each team was in charge of taking a picture of the final result of each effort.</p>
GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS	

FEEDBACK & ASSESSMENT	The children themselves answered their questions, discussed their recordings and evaluated the final results of their efforts (artworks). After taking photos of them, we kept a record of the activity for feedback and assessment.
EVALUATION (FOR PURPOSES OF GRADING)	In order to assess pupils' learning and understanding of the material, in the case of marking, teachers should evaluate children's recordings and creations, which reveal how children perceive different events, organize the information and materials available to them and draw conclusions from the data they have collected.
WAS IT IMPLEMENTED/ TESTED OR NOT? IF YES, PLEASE EXPLAIN THE PROCESS (DURATION OF THE IMPLEMENTATION, GRADES, PROCESS)	<p>The activity plan was implemented in the classroom over the course of a day.</p> <p>(a) The activity started one morning in the classroom with discussion, questions and assumptions,</p> <p>(b) continued in groups at their tables with experiments, recordings, observations and conclusions,</p> <p>(c) was completed after the break with the artistic creations and the photographic illustration of the results.</p>
IF YES, WILL YOU PLEASE WRITE YOUR REFLECTION/ EVALUATION? (CONSTRAINTS ABOUT THE TIMING, MATCHING THE OBJECTIVES ETC.)	The activity plan came from the children's curiosity and questions, evolved with their cooperation and experimentation, motivated further reflections, hypotheses and conclusions, and in the end, was a success. The teacher had a supporting and guiding role, while the students experienced the process and enjoyed their own success in discovering new knowledge through the research. The objectives were achieved and the results were highly satisfactory.
INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY	

NGSS Lesson Plan (Greece)

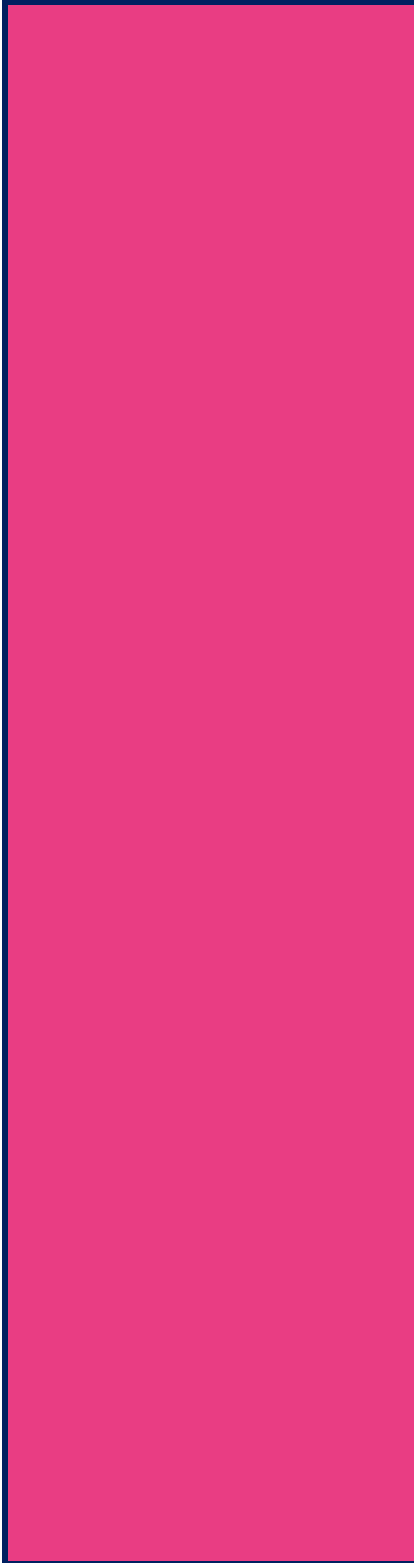
By Sofia Chatzoglidou, kindergarten teacher, Crete, Greece

ACTIVITY / LESSON TITLE	FRICTION/CONSTRUCTING SPEED RAMPS
TARGET GROUP	Age of children/students: 4,5-6 Education level: pre-school education
DURATION	<ul style="list-style-type: none"> 20 minutes of children experimenting with the materials 30 minutes of children experimenting with materials/construction 15 minutes recording of results/discussion
LEARNING ENVIRONMENT	Indoor or outdoor space This activity can be implemented both indoors and outdoors
STEAM & SEL COMPETENCES	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input checked="" type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Empathy

	<input checked="" type="checkbox"/> Drawing motivated conclusion <input type="checkbox"/> Problem solving <input type="checkbox"/> Creative thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Curiosity <input type="checkbox"/> Confidence & Assertiveness <input type="checkbox"/> Collaboration <input type="checkbox"/> Integrity
<p>EXPECTED LEARNING OUTCOMES</p>	<p>What are children/students expected to learn/develop through this activity/lesson?</p> <ul style="list-style-type: none"> ● To observe ● To experiment ● To cooperate ● To communicate ● To get in touch with the concept of friction ● To understand the properties of objects ● To communicate ● To try to answer questions ● To develop their scientific vocabulary ● To play ● To have fun
<p>SUBJECTS AND TOPICS COVERED</p>	<p>Language, mathematics, science, engineering</p>
<p>METHODOLOGIES</p>	<input type="checkbox"/> Design Thinking <input checked="" type="checkbox"/> Inquiry based learning <input type="checkbox"/> Problem Based Learning

	<input type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori (μάθημα σε 3 στάδια)
TOOLS / MATERIALS / RESOURCES	Materials: toys such as cars, trains, etc. , long surfaces (wood, cardboard, etc.) covered with materials of various textures (e. g. cardboard and fabrics), various covering materials such as fabrics, cardboard in various textures, aluminum foil, sandpaper, etc. , glue sticks and scissors.
DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS	<p>In a part of the classroom with easy access for everyone we place the long surfaces we have prepared and the games.</p> <p>step 1: The children observe the surfaces, touch them and roll the toys on them, making assumptions on how the texture of the material covering each ramp affects its speed.</p> <p>step 2: The children try to make their own ramps with the materials we have given them (fabrics, cardboard in various textures, aluminum foil, sandpaper, etc.).</p> <p>step 3: After the end of the activity, the children start a discussion about the ramps that they built and the materials they chose to cover them with. Teachers can ask children the following questions :</p> <ul style="list-style-type: none"> - How did you build your ramps? - What materials did you use? - Why did you choose to build your ramp with this material? - Do the little cars run the same speed on all the ramps? - What is the difference in their speed? - If you wanted the cars to roll faster, what material would you use to build the ramps? - If you wanted the cars to roll slower, what material would you use to build the ramps?

	<p>- What do you think the speed of cars depends on?</p>	
<p>INTEGRATION OF ART</p>	<p>Materials: the toys we used in the previous activity, paper, tempera.</p> <p>step 1: Spread a piece of paper on a smooth surface and place the toys we used in the previous activity on it.</p> <p>step 2: Encourage children to move the toys by observing their speed.</p> <p>step 3: Encourage the children to dip the toys in paint and try again to roll them on the paper, observing if there is any change in their speed.</p>	
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>		
<p>FEEDBACK & ASSESSMENT</p>	<p>Students discuss about the properties of the materials they used to build their ramps.</p>	
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>Assessment of students' learning and understanding of the material for the purposes of marking and reporting can be obtained by the teacher's discussion with the children about the ramps they have constructed.</p>	
<p>WAS IT IMPLEMENTED/ TESTED OR NOT? IF YES, PLEASE EXPLAIN THE PROCESS (DURATION OF THE IMPLEMENTATION, GRADES, PROCESS)</p>	<p>step 1: A makeshift cardboard ramp was placed in the centre of the classroom, lined with four different materials (sandpaper, burlap, sack and cardboard).</p> <p>step 2: The children touched the surfaces, observing and</p>	

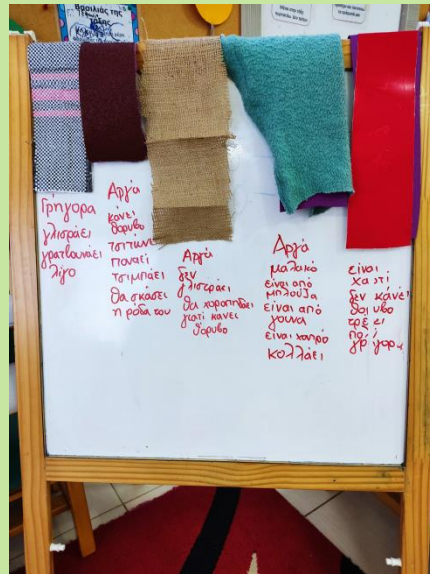


discussing among themselves the textures of the different materials with which they were covered.

step 3: The children experimented with textures by rolling the cars on the ramps. Through the game, they found that the speed of the cars changed depending on which ramp they used each time.

step 4: Various materials were placed on the classroom tables (sandpaper, burlap, burlap sack, cardboard boxes, shiny cardboard and woolen cloth) and the children were encouraged to make their own ramps.

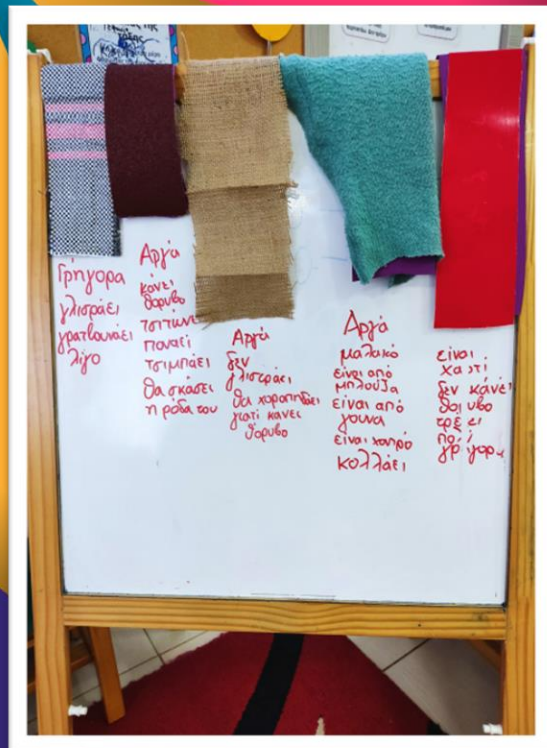
step 5: Once all the groups had completed their constructions, they presented them to each other. Through the discussion that followed, the children came to some conclusions about the properties of the materials they used to construct their ramps.



IF YES, WILL YOU PLEASE WRITE YOUR REFLECTION/

This activity helped the children to understand the properties of the materials they were given and the fact that the speed of a body is affected by the force of friction. This conclusion follows

EVALUATION? (CONSTRAINTS ABOUT THE TIMING, MATCHING THE OBJECTIVES ETC.)	from the children's decision to use glossy cardboard and cardboard boxes in order to build fast "tracks", as they called them, for their cars, while, on the contrary, when the kindergarten teacher asked them to build a track where the cars would roll at low speed, they chose to use sandpaper and woolen fabric.
INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY	If you are basing your activity/lesson on an existing source or work, provide the author's details: name, link to the online source where the lesson is published or whatever is available. If the course was created by you, please provide instructions on the terms in which you share your work.



NGSS Lesson Plan (Greece)

By Stella Frantzeskaki, kindergarten teacher, Rethymno, Crete, Greece

ACTIVITY/ LESSON/TITLE	MATERIALS THAT DISSOLVE OR ABSORB WATER
TARGET GROUP	Age of children/students 4,5-6
DURATION	30 minutes of watching a video, understanding the problem and recording cases 30 minutes of experimentation with the materials 20 minutes of recording the results and discussion
LEARNING ENVIRONMENT	Indoor or outdoor space This activity can be carried out either outdoors or indoors
STEAM & SEL SOCIAL AND EMOTIONAL SKILLS	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input checked="" type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input checked="" type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input checked="" type="checkbox"/> Experimentation <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input type="checkbox"/> Submission of major <input type="checkbox"/> Management skills <input type="checkbox"/> Information empathy <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Curiosity <input type="checkbox"/> Confidence and self-confidence <input type="checkbox"/> Collaboration <input type="checkbox"/> Integrity
EXPECTED LEARNING OUTCOMES	What are children/students expected to learn/develop through this activity/lesson?

	<ul style="list-style-type: none"> ● Observe ● Make assumptions and verify them ● Experiment with different materials ● Select materials they will need using their thinking and previous experience to experiment and find solutions to natural problems ● To come into contact with the concept of solubility in water ● Understand the properties of objects in relation to water ● Cooperate and work in teams ● To learn information about the natural environment of the Kourtaliotiko Gorge ● To find effective solutions to practical problems such as how much food will be needed for a day and how heavy a climbing bag can be so as not to disturb the climber. ● They will learn to group objects and categorise based on solubility.
<p>TOPICS/SUBJECTS COVERED</p>	<p>Getting to know the natural environment. science, mathematics, problem solving through experiments.</p>
<p>METHODOLOGIES</p>	<p><input type="checkbox"/> Design Thinking <input type="checkbox"/> Inquiry-based learning <input checked="" type="checkbox"/> Problem Based Learning</p>
<p>TOOLS/MATERIALS/ RESOURCES</p>	<p>For the activity we will need:</p> <ul style="list-style-type: none"> ➤ A map of Crete, ➤ photos of the Kourtaliotiko Gorge, ➤ a video of “Gregory” the class puppet, expressing his desire to cross the gorge and his concern about the food he will be bringing along; ➤ water, transparent basins that can hold the materials to be submerged, ➤ clear plastic cups, jars, paper and plastic bags, napkins, spoons and other mixing utensils, carrots, cucumbers, apples, honey, sugar, coffee, toast bread, toast cheese, cereal, nuts.
<p>DETAILED DESCRIPTION (STEP BY STEP) OF THE</p>	<p>With the children we watch a video with Gregory, the classroom puppet, who says that he has</p>

<p>ACTIVITY / SEQUENCE OF MODULES</p>	<p>enrolled in the mountaineering club and is preparing to cross the Kourtaliotiko gorge. Gregory asks the children to help him take some food with him so that he and his climbing friends can have something to eat after the trip. However, because he will be in the water and swimming most of the time, whatever he takes with him should not dissolve in the water.</p> <p>Step 1. Show the children the map of Crete and locate the gorge. The children observe pictures of the gorge and discuss in groups what they see. We ask the children to think about what they will need to solve this problem and help Gregory not to go hungry after his walk through the water.</p> <p>Step 2. The children write down their hypotheses</p> <p>Step 3. The children experiment with the materials and water</p> <p>Step 4. They note on double entry charts which foods dissolve and which do not.</p> <p>Step 5. After experimenting, they record the items they choose to keep for Gregory on his field trip.</p> <p>Step 6. They place the ones they chose in backpacks in groups and check to see if the result is functional.</p> <p>At the end of the activity there is a discussion around the children's choices. The implementation of this activity will be completed in two or more organised activities.</p> <p>Questions that teachers can pose to the children:</p> <ul style="list-style-type: none"> ● What did you put in Gregory's bag? ● Why did you choose these foods? ● Which foods absorb water and soak? ● What can we do to carry foods that dissolve and absorb water? ● Are the ones you chose easy to transport? ● What makes you say that?
<p>INTEGRATION OF ART</p>	<p>Using natural materials such as soil, pebbles, leaves, twigs, rosemary, glue and water, each child makes their own natural painting.</p>

<p>GENDER-SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR THE INCLUSION OF VULNERABLE GROUPS OF PUPILS</p>	<p>This activity is for all children, because it will help them to experiment with the laws of nature and the reactions of the materials that will be used and will boost their confidence and knowledge, but it will also enable them to use this knowledge to find solutions to similar life problems that may occur in real life.</p>
<p>FEEDBACK AND EVALUATION</p>	<p>Students discuss in plenary about the properties of materials and which foods absorb water and which dissolve directly and why. What criteria were used to select the foods that would serve Gregory in these circumstances.</p>
<p>EVALUATION (FOR SCORING PURPOSES)</p>	<p>The assessment results from the teacher's discussion with the children about the reasons for choosing food and packaging materials to transport materials that dissolve or absorb water.</p>
<p>IMPLEMENTED/OR NOT? IF YES, PLEASE EXPLAIN THE PROCEDURE (DURATION OF APPLICATION, GRADES, PROCEDURE)</p>	<p>Step 1: the children watched the video, located the Kourtaliotiko Gorge on the map of Crete and looked at the photos, discussing what they observed.</p> <p>Step 2: They wrote down their hypotheses about what would be functional for Gregory to take with him for lunch on the trip.</p> <p>Step 3: Experimenting with the ingredients and water and testing the effectiveness of the hypotheses. Re-selection of foods that do not spoil on contact with water.</p> <p>5th step: Discussion on the selection of suitable foods and search for solutions for bread transport.</p> <p>Step 6: Recording the list of foods to be finally selected and preparing the bag in groups.</p> <p>7th step: Presentation of the groups' decisions to the plenary and discussion.</p>
<p>IF SO, CAN YOU WRITE THE REFLECTION/EVALUATION OF THIS IMPLEMENTATION (CONSTRAINTS ON</p>	<p>After experimenting with the ingredients and their solubility, the children distinguished which foods dissolved and which absorbed water so that they could not be eaten and which were not affected at all by contact with water. Some foods, however, in the children's opinion, needed to be transported,</p>

TIMING, MATCHING WITH OBJECTIVES, ETC.)?	such as bread, so the children experimented with ways of transporting it using waterproof materials that are airtight and prevent water from penetrating.
INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY	If the lesson was created by you, please provide instructions on the terms in which you are sharing your work.

NGSS STEAM PROJECT (Romania)

By IONIȚĂ CRINA-TATIANA - Kindergarten no. 16, Târgoviste, România

ACTIVITY/ LESSON TITLE	THE SQUARE PUMPKIN
TARGET GROUP	Pre-school (3-4 years old)
DURATION	30 minutes each day
LEARNING ENVIRONMENT	Indoor
STEAM & SEL COMPETENCES	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input checked="" type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input checked="" type="checkbox"/> Tech Literacy <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input checked="" type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making

	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Confidence & Assertiveness <input checked="" type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Integrity <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p>EXPECTED LEARNING OUTCOMES</p>	<p>What kids/ pupils are supposed to learn/develop through this activity/lesson?</p> <ul style="list-style-type: none"> ● the component parts of a pumpkin ● the life cycle of the pumpkin ● secondary colors ● geometric shapes
<p>SUBJECTS AND TOPICS COVERED</p>	<ul style="list-style-type: none"> ● Mathematics ● Science ● Art ● Engineering ● Language learning ● Technology
<p>METHODOLOGIES</p>	<p>Montessori 3-stage lesson</p>
<p>TOOLS / MATERIALS / RESOURCES</p>	<ul style="list-style-type: none"> ● pumpkins ● soil for flowers ● pots, plasticine ● wire, movable eyes ● wooden sticks ● wooden pliers ● cubes ● glue gun ● lego pieces ● pictures from the story <p>(https://www.youtube.com/watch?v=K-acOrQ3aSo)</p>

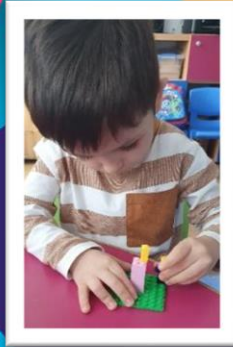
<p style="text-align: center;">DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS</p>	<p>Step 1</p> <p>The starting point for this STEAM activity was the story "The Legend of Spookley the Square Pumpkin", by Joe Troiano. After the explanatory reading of the story, the preschoolers were challenged to discuss with each other the life cycle of a pumpkin, to create pumpkins of different shapes and colours, based on the story they heard, and to build a stronger fence for the garden.</p> <p>Step 2</p> <p>Science: Preschoolers observed the component parts of a pumpkin. In order to better understand the life cycle of a pumpkin, they placed a pumpkin in a jar with a little moist soil, observing how it decomposes, sprouts, and blooms. Thus, preschoolers learn more about germination, decomposition, seeds, pumpkin plants, etc.</p> <p>Technology: they chose the materials to build a more durable garden fence.</p> <p>Engineering: Preschoolers built pumpkin stands and garden fence</p> <p>Art: Preschoolers mixed different colours of playdough to get different colours for pumpkins.</p> <p>Mathematics: Preschoolers built pumpkins out of Lego pieces and playdough of different shapes and colors (circle, square, triangle, rectangle).</p> <p>Step 3</p> <p>After finishing the constructions, the preschoolers presented the products they made to the group.</p>
<p style="text-align: center;">INTEGRATION OF ART</p>	<p>Preschoolers mixed different colours of playdough to get different colours for pumpkins.</p>
<p style="text-align: center;">GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR</p>	<p>The groups were made up of girls and boys, preschoolers with special educational needs were also included.</p>

<p>STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	
<p>FEEDBACK AND ASSESSMENT</p>	<p>Preschoolers received positive feedback from their peers and teachers.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>The children's work will be evaluated by colleagues and the teacher in relation to the criteria discussed in the previous stage (aspects related to collaboration, the correct use of the knowledge and skills learned)</p>
<p>HAS THE LESSON PLAN BEEN IMPLEMENTED/TESTED? IF SO, PLEASE EXPLAIN THE PROCESS (IMPLEMENTATION TIME, AGE LEVEL, STEPS, ETC.).</p>	<p>The lesson plan was implemented with a group of preschoolers between the ages of 3 and 4. The activities took place over three days and lasted 30 minutes each day.</p> <p>The project was a real success among the preschoolers, they collaborated and worked with great enthusiasm. In the future I would do more activities that include art.</p>
<p>IF YES, PLEASE PROVIDE A BRIEF EVALUATION/REFLECTION ON ITS IMPLEMENTATION. (IMPLEMENTATION STRENGTHS/WEAKNESSES, TIMING CONSTRAINTS, SUITABILITY FOR INTENDED OBJECTIVES, ETC.).</p>	<p>Strong points:</p> <ul style="list-style-type: none"> - The possibility for preschoolers to study and manipulate the materials provided; - Collaboration among preschoolers for the creation of products; <p>Weak points:</p> <ul style="list-style-type: none"> - Not all preschoolers were involved in presenting their own works; - Carrying out the activities over several days, led to the disinterest of some preschoolers in carrying out the activities.
<p>INTELLECTUAL PROPERTY RIGHTS (IPR)/ ORIGIN OF THE ACTIVITY</p>	<p>https://preschoolsteam.com/preschool-stem-activities-spookley-square-pumpkin/- Jamie</p>

STEP 1



STEP 2



STEP 3



NGSS STEAM PROJECT (Romania)

https://www.canva.com/design/DAFrHhJ26zw/MzyFOAm9j3LAUk8HYWWwgA/edit?utm_content=DAFrHhJ26zw&utm_campaign=designshare&utm_medium=ink2&utm_source=sharebutton

By LUNGEANU CERASELA, KINDERGARTEN NO. 13, TÂRGOVIȘTE, Romania

ACTIVITY / LESSON TITLE	THE COLORFUL RUSTLING AUTUMN LEAF
TARGET GROUP	The one-day STEAM project The colorful rustling autumn leaf , focusing on IBL and PBL approaches, was successfully implemented at the middle group A from Kindergarten no. 13, Târgoviște. Preschoolers, both girls and boys, (ages 4 to 5) from different backgrounds participated in the activity. The materials used in the project were accessible to all 24 preschoolers.
DURATION	One-day STEAM project
LEARNING ENVIRONMENT	The preschoolers were provided experiential learning opportunities both inside and outside the classroom, according to their skills
STEAM& SEL COMPETENCES	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Mathematical and scientific language <input checked="" type="checkbox"/> Basic science concepts <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Experimentation <input checked="" type="checkbox"/> Problem solving <input type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Digital literacy <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Communication

	<input checked="" type="checkbox"/> Asking meaningful questions <input checked="" type="checkbox"/> Creative Thinking <input checked="" type="checkbox"/> Collaboration
EXPECTED LEARNING OUTCOMES	<p>-To describe the main features of a typical autumn leaf such as color, shape, size, scents;</p> <p>-To identify the type of the leaves using digital technology (smartphone/PlantNet App);</p> <p>-To design, engineer and build a functioning leaf gathering rake;</p> <p>-To create an original design by assembling the autumn leaves, acting creatively;</p> <p>-To sort and group the autumn leaves by color and size.</p>
SUBJECTS AND TOPICS COVERED	science, math, art, language, technology, engineering.
METHODOLOGIES	<input type="checkbox"/> Design Thinking <input checked="" type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori 3-stage lesson
TOOLS / MATERIALS / RESOURCES	laptop, video projector to run the story <i>Leaf man</i> , by Lois Ehlert, leaves of various colors, shapes and sizes, smartphone to capture photos of leaves and identify them using PlantNet App, drawing sheet, colored pencils, paperboard, expanded polystyrene, plastic forks and straws, scissors, duct tape for building the leaf gathering rake, colored paper sheets, leaves, wiggly eyes, pompoms, silicone glue for leaf-man craft, sorting and grouping Twinkl worksheets.
DETAILED DESCRIPTION OF THE STEP-BY-STEP	1. Indoor, the preschoolers listened to the story <i>Leaf Man</i> , by Elois Elhert) https://youtu.be/2ZoFy4EUddU . This wonderful autumn-themed story offered the appropriate context for exploring how nature changes in the fall. The carpet of colourful rustling autumn

**DESCRIPTION OF
THE ACTIVITY /
SEQUENCES OF
THE UNITS**

leaves from our kindergarten yard provided the perfect opportunity for learning and fun.

2. **SCIENCE (Outdoor)** To further explore and learn more about autumn leaves, I guided my preschoolers through the inquiry process and helped them to investigate the autumn leaves through sensory organs, to ask meaningful questions such as:

What signs of autumn`s arrival do we see in the trees and on the ground?

Why do the leaves have so many colours?

What colours are those?

What do we hear when the leaves fall off trees?

What shapes do we see?

What does a leaf remind me of?

What do leaves smell like?

How does the leaf feel like?

What types of leaves are those, and from what kind of trees?

In the process they communicate their thoughts, ideas and discoveries:

The leaves are as small as we are. They have clothes of different colors.

The leaves make noise. Do they talk out loud? Maybe they play or quarrel.

This leaf smells like a garden.

It feels like a smooth hand. If you press, it crumbles like a cookie.

3. **TECHNOLOGY** The fun and learning continued with identifying the autumn leaves simply by photographing them with the smartphone and within an App to identify the type of the leaves. The preschoolers had the opportunity to connect with nature and learn different types of leaves and their names. They collected all those beautiful leaves and created their own leafbooks.

4. **ENGINEERING** As the autumn wind began to blow and the coloured leaves were dancing from here to there in the kindergarten yard, I challenged my preschoolers to build a rake in order to gather the dancing leaves. To accomplish this task, they went back to the classroom where they worked as a team, discussing and analysing the provided materials. They issued opinions on what a cool rake should look like and what materials would be more suitable for its construction. They drew a sketch, chose the right materials and assembled the rake. Once the rake was built, they tested its endurance, both indoor and outdoor.

5. **ARTS** Inspired by the Leaf Man Story, my preschoolers engaged in a art and craft activity, having a pleasant musical background .

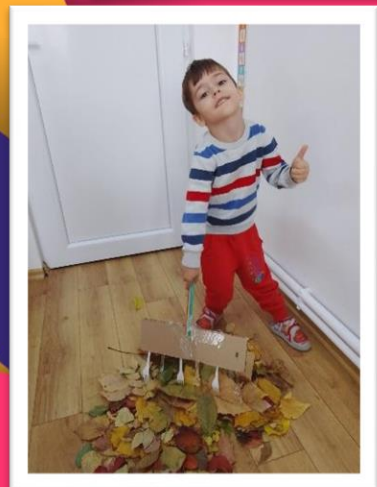
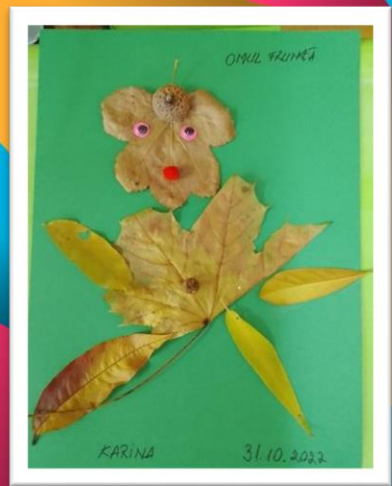
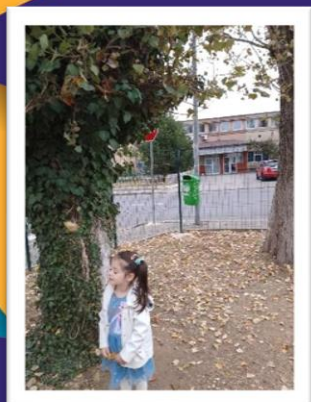
(<https://www.youtube.com/watch?v=nyHXY2amfqs>);

They creatively combined leaves of various colors, shapes and sizes, using also "wiggly eyes" and acorn hats to obtain cool funny little men. They were all happy to have turned the colourful rustling autumn leaves into funny men.

6. **MATHEMATICS** At the suggestion of a little girl, we went out in the kindergarten yard to impersonate the autumn wind and sort the leaves by colour and size and try to find how many they were by numbering them.

	<p>7. At the end of our STEAM project, my preschoolers danced around in the piles of leaves they had gathered along with their cool rakes. They accompanied the dance movements with messages addressed to the colorful rustling autumn leaves.</p>
<p>INTEGRATION OF ART</p>	<p>Inspired by the Leaf Man Story, my preschoolers engaged in a art and craft activity, having a pleasant musical background (https://www.youtube.com/watch?v=nyHXY2amfqs); they creatively combined leaves of various colors, shapes and sizes, using also "wiggly eyes" and acorn hats to obtain cool funny little men. They were all happy to have turned the colourful rustling autumn leaves into funny men.</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>Preschoolers, both girls and boys, from different backgrounds participated in the activity. The materials used in the project were accessible to all preschoolers.</p>
<p>FEEDBACK & ASSESSMENT</p>	<p>Children`s works were displayed, valued and appreciated by the children and teachers of the kindergarten. They talked about what worked and what did not with their teacher and colleagues. Their parents were sent a movie to watch on our classroom Facebook group.</p>
<p>EVALUATION (FOR PURPOSES OF GRADING)</p>	<p>In order to evaluate the children`s learning and understanding, I proposed the <i>Magic microphone</i> play. My preschoolers shared their reviews and thoughts about the project activities – what activity they enjoyed the most and why, what would they do again, etc</p>
<p>STRENGTHS</p>	<p>To implement the project, my preschoolers were provided age-specific educational resources, recycled materials or from nature itself. I created outdoor learning opportunities favouring the open exploration and investigation, the integration of art and science as well as the engaging instruction and practice.</p>

WEAKNESSES	Minimum guidance during the learning process is less effective.
INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY	https://ngss.erasmus.site/ro/ https://www.stepbystep.ro/stire/anunturi/atelierele-edu2023-educatia-timpurie-din-perspectiva-steam/ https://preschoolsteam.com/leaves-preschool-steam-activities/



NGSS STEAM PROJECT (Romania)

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Teacher Moldovan Liliana, kindergarten no 16, Targovishte, Romania

ACTIVITY / LESSON TITLE	CHRISTMAS TREE LIGHTS - SIMPLE ELECTRICAL CIRCUITS
TARGET GROUP	Preschoolers 5 and 6 years old
DURATION	One day
LEARNING ENVIRONMENT	Group classroom (interest areas: SCIENCE, ART)
STEAM & SEL COMPETENCES	<input checked="" type="checkbox"/> Knowledge about the world <input type="checkbox"/> Mathematical and natural scientific language <input checked="" type="checkbox"/> Numeracy <input type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Asking meaningful questions

	<ul style="list-style-type: none"> <input type="checkbox"/> Information management skills <input checked="" type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input checked="" type="checkbox"/> Creative Thinking <input checked="" type="checkbox"/> Responsible decision making <input type="checkbox"/> Communication <input checked="" type="checkbox"/> Confidence & Assertiveness <input type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Integrity <input type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p style="text-align: center;">EXPECTED LEARNING OUTCOMES</p>	<p>Science</p> <p>To understand some basic information about electrical conductors and insulators.</p> <p>To build a simple electrical circuit;</p> <p>Mathematics</p> <p>To measure the determined length with a ruler.</p> <p>To trace the measurement on paper.</p> <p>Engineering</p> <p>To search for solutions to solve the problem.</p> <p>To draw//design the simple electrical system</p> <p>To discuss the limits of the solutions.</p> <p>Technology</p>

	<p>To use the tools for the simple electrical circuit.</p> <p>To plan the stages of electrical circuit design;</p> <p>Art</p> <p>To draw/paint the overall Christmas tree design.</p> <p>To making decorative elements of the tree by cutting, gluing and assembling them all together.</p>
<p>SUBJECTS AND TOPICS COVERED</p>	<p>Physical phenomena and simple electrical circuits</p> <p>Mathematics, Science, Art, Engineering, Language Education, Technology</p>
<p>METHODOLOGIES</p>	<p><input checked="" type="checkbox"/> Scamper</p>
<p>TOOLS / MATERIALS / RESOURCES</p>	<p>Google Earth (Mățara village, Colți commune)</p> <p>https://earth.app.goo.gl/xvhpMb</p> <p>Letter</p> <p>Cardboard tree</p> <p>Scissors</p> <p>Watercolour?</p> <p>Coloured paper</p> <p>Aluminium foil</p> <p>Batteries</p> <p>Led</p> <p>Ruler</p> <p>Glue</p>
<p>DETAILED DESCRIPTION OF THE STEP-BY-STEP</p>	<p>Introduction to the subject matter:</p> <p>A letter has been sent to the preschoolers from Matei, a young boy residing in the village of Mățara, located in Buzău county;</p>

<p>DESCRIPTION OF THE ACTIVITY/SEQUENCES OF THE UNITS</p>	<p>the village is situated very far in the mountains, isolated from other localities. Unfortunately, Matei's village does not have access to electricity, and as a result, he has never had the opportunity to light up a Christmas tree during the holiday season. The only sources of artificial light available to him are candles and lamps, which has left him feeling sad.</p> <p>The children and their teacher search for the village of Matara using Google Earth. They will notice that there are very few houses in the area, isolated from more populated areas such as Colții de Jos.</p> <p>The children are encouraged to think of a solution to help Matei. The teacher guides them through the SCAMPER stages:</p> <p>S - Substitution: How can we make a Christmas tree with lights if we don't have electricity?</p> <p>The children guided by the teacher initiate a discussion about creating electrical circuits and materials that could conduct electricity.</p> <p>C - Combining: what objects can we combine to create an electrical circuit if we do not have electrical wiring and electrical current?</p> <p>The children look for and identify objects in the classroom that could be combined to build a simple electrical circuit.</p> <p>A - Adapting: What other object could we use instead of a lamp?</p> <p>Exploring: The children are shown the cardboard tree that they need to light it up. Work groups are formed, and each group is given the materials needed to make the electrical circuit (aluminum foil, batteries, LEDs). A diagram of a simple electrical circuit is presented,</p> <p>and then the children work in groups to make their own circuit</p>
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	<p>diagram.</p> <p>M - Modification: If the size of the aluminum foil is not measured</p> <p>what change would it produce in the electrical circuit?</p> <p>Children think of the question and experiment by measuring different sizes of the aluminum foil.</p> <p>P - Establishing another use: How can you use such an electrical circuit in everyday life? What can we install it on?</p> <p>Children give various answers and discuss them.</p> <p>E - Disposal: If we remove the aluminum foil, what other object can we use to transmit the electric current from the battery to the LED?</p> <p>Children answer the questions.</p> <p>R - Re-arranging/reversing: If you re-design the electrical circuit,</p> <p>what would it look like?</p> <p>Children give various answers and discuss them.</p>
<p>INTEGRATION OF ART</p>	<p>Designing the overall Christmas tree design.</p> <p>Making decorative elements of the tree by cutting, gluing, assembling.</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>Organise homogeneous working groups.</p> <p>Giving instructions that do not affect or eliminate children's creativity.</p> <p>Eliminating influence in the choice of colours, patterns used.</p>
	<p>Presentation of children's work results involves verbal assessments from educators and colleagues.</p>

FEEDBACK & ASSESSMENT	<p>The tree in the kindergarten hallway is displayed for colleagues to appreciate by pasting stickers on it.</p>
EVALUATION (FOR PURPOSES OF GRADING)	<p>Verbal appreciation given by teachers and colleagues.</p>
WAS IT IMPLEMENTED/ TESTED OR NOT? IF YES, PLEASE EXPLAIN THE PROCESS (DURATION OF THE IMPLEMENTATION, GRADES, PROCESS)	<p>The lesson plan was applied to a group in the Kindergarten with extended program nr. 16, Târgoviște. The preschoolers in this group ages between 5 and 6 years.</p> <p>The whole activity took place over one day.</p> <p>Starting with the morning meeting, the children are introduced to the problem they had to solve through the presentation of the letter from Matei, the little boy who asked them to help with the Christmas tree lighting.</p> <p>The activity started with a discussion about materials that conduct current electrical conducting materials, insulating materials and electrical circuits. With batteries, LEDs and aluminum foil, the preschoolers made electrical circuits simple circuits. They drew an electrical circuit, measured the materials using a ruler, and cut out and assembled the electrical circuit.</p> <p>The Scamper method was achieved by applying a set of specific questions.</p> <p>The preschoolers replaced the natural tree with a cardboard one decorated with and the electrical wiring was replaced with a circuit board made of aluminum foil, batteries and LEDs</p> <p>The evaluation was carried out by presenting the results of each working group and the appreciation of the teachers, and the group mates, but also the appreciation from colleagues in other groups.</p>

<p>IF YES, WILL YOU PLEASE WRITE YOUR REFLECTION/ EVALUATION? (CONSTRAINTS ABOUT THE TIMING</p>	<p>Strengths:</p> <ul style="list-style-type: none"> -The opportunity for preschoolers to study and manipulate the materials provided. -Collaboration between preschoolers to produce products; - Development of creativity. <p>Weaknesses:</p> <ul style="list-style-type: none"> -Not all preschoolers were involved in presenting their own work.
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>ShareAlike (sa)</p> <p>You let others copy, distribute, display, perform, and modify your work, as long as they distribute any modified work on the same terms. If they want to distribute modified works under other terms, they must get your permission first.</p>

More information on Social and Emotional Competences:
<https://drive.google.com/file/d/1Ao3gc4VEuBFE1LgVrSxdRBIK1ABa3nX/view?usp=sharing>





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By Mariana Iulia Pitiş - KINDERGARTEN NO. 13, TÂRGOVIŞTE, Romania

ACTIVITY / LESSON TITLE	WATER – THE MIRACLE OF LIFE
TARGET GROUP	Children aged 4 and 5 years old; Level of education - pre-school;
DURATION	3 days (25 minutes sessions at every beginning of a lesson)
LEARNING ENVIRONMENT	Indoor / outdoor
STEAM & SEL COMPETENCES	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input checked="" type="checkbox"/> Numeracy <input type="checkbox"/> Spatial thinking <input type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Drawing motivated conclusion

	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Problem solving <input type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Confidence & Assertiveness <input checked="" type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Integrity <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p style="text-align: center;">EXPECTED LEARNING OUTCOMES</p>	<ul style="list-style-type: none"> ● SCIENCE - to describe how does the water move in a cycle; ● TECHNOLOGY - to identify the rain with the help of digital technology (Iq Board); ● ENGINEERING – using instruments to experiment the four steps of water cycle: accumulation, evaporation, condensation, precipitation; ● ARTS - to create a cloud with rain drops; ● MATHEMATICS - to number rain drops from 1 to 5;
<p style="text-align: center;">SUBJECTS AND TOPICS COVERED</p>	<p>Science, Technology, Engineering, Art, Mathematics.</p>
<p style="text-align: center;">METHODOLOGIES</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Design Thinking <input checked="" type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input type="checkbox"/> SCAMPER <input type="checkbox"/> Montessori 3-stage lesson
<p style="text-align: center;">TOOLS / MATERIALS / RESOURCES</p>	<ul style="list-style-type: none">  Online movie about Water cycle https://www.youtube.com/watch?v=mylCQjryPiU  A poster with information and pictures about the rain;  Water Cycle mock-up;

	<p>🔊 Instruments for experiments: transparent glasses, water, boiled water, shaving foam, pipettes, blue paint, sprinklers, a mirror, transparent bags, measuring cups;</p> <p>🔊 Integration of arts and mathematics: Making a cloud with raindrops (numbering 1 to 5);</p>
<p>DETAILED DESCRIPTION OF THE STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS</p>	<p>The first day, during the morning routines, the children were outdoors and observed nature, mainly the weather characteristics and the sky, the air, and the rain. They observed the water forms (rain and clouds). They are invited to wonder about what they observed and to ask questions. Indoors – 20 min the next day, children watched a movie Pixi – the Water Cycle and talked about the water cycle, and on the third day, they investigated the water cycle through experiments with water, talked about what they discovered and learned, and drew clouds and rain.</p> <p>Link with the activity:</p> <p>https://www.canva.com/design/DAFS18XeePg/OPXCF98mB_F88gwMncKNMg/view?utm_content=DAFS18XeePg&utm_campaign=designshare&utm_medium=link&utm_source=homepage_design_menu</p>
<p>INTEGRATION OF ART</p>	<p>Preschoolers coloured rain clouds and drew raindrops.</p>
<p>GENDER SPECIFIC ASPECTS AND ADAPTATIONS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>Preschoolers, both girls and boys, from different backgrounds participated in the activity. Two preschoolers from disadvantaged backgrounds also participated. This method allows each preschooler to work at their own pace, using their preferred learning style. Girls and preschoolers from disadvantaged backgrounds can express their thinking in the best possible way.</p>
<p>FEEDBACK & ASSESSMENT</p>	<p>The evaluation of the activity within the project was done through a game called the Magic Microphone. The children had the opportunity to share impressions about the project (what</p>

	activity/experiment they liked the most, what activity they would repeat).
EVALUATION (FOR PURPOSES OF GRADING)	- Observation list for children;
WAS IT IMPLEMENTED/ TESTED OR NOT? IF YES, PLEASE EXPLAIN THE PROCESS (DURATION OF THE IMPLEMENTATION, GRADES, PROCESS)	<p>The project <i>WATER - the miracle of life</i> was implemented to pre-schoolers from Kindergarten no.13 from Târgoviște.</p> <p>Participants: 16 preschoolers aged 4 years, girls and boys, from different backgrounds;</p> <p>Place: The project took place over a period of 3 days, 25 minutes / day, indoor/outdoor;</p> <p>In the first day of implementation, pre-schoolers had an environment observation: they went outside and observed the weather. Pre-schoolers spent 25 minutes in the kindergarten yard and noticed rain / rainfall, clouds, soil. They asked questions about rain: Why is raining? How is raining? Where goes the rain?</p> <p>In the following activities, the next two days, pre-schoolers discovered information about water through the Inquiry Based Learning method. Preschoolers became researchers, searched for information about water. They used instruments to experiment the four steps of water cycle: accumulation, evaporation, condensation, precipitation (transparent glasses, cold water, boiled water, shaving foam, pipettes, blue paint, sprinklers, a mirror, transparent bags, measuring cups).</p> <p>For integration of arts and mathematics, pre-schoolers made clouds with raindrops (numbering 1 to 5).</p>
IF YES, WILL YOU PLEASE WRITE YOUR REFLECTION/ EVALUATION? (CONSTRAINTS)	For the implementation of the project, I used materials for pre-schoolers. The movie <i>Pixi - the water cycle</i> was created for pre-school education. The experiments were accessible to children.

<p>ABOUT THE TIMING, MATCHING THE OBJECTIVES ETC.)</p>	<p>Steps:</p> <ul style="list-style-type: none"> 🔊 GROUP OBSERVATIONS – children observed the environment. (kindergarten courtyard/park; a rainy weather; precipitation) 🔊 ASKING QUESTIONS – children asked questions about water, the water cycle etc.(How is the weather today? What is a cloud? Do we have clouds on the sky? What is the rain? Where does the rain come from? Can the rain return in the clouds? What is a water cycle? Can we see the water cycle?) 🔊 EXAMINATION OF THE MATERIALS – The children searched for information in the kindergarten yard and from watching the movie Pixi – the Water Cycle, they played with water, and listened to the sound of the rain. 🔊 PLANNING THE INVESTIGATIONS – children received information about water through various experiments about accumulation, evaporation, condensation and precipitation. 🔊 UNDERSTANDING - children proposed answers, and explanations and communicated the results of the experiments.
<p>INTELLECTUAL PROPERTY RIGHTS (IPR) / ORIGIN OF THE ACTIVITY</p>	<p>https://www.canva.com/design/DAFS18XeePg/OPXCF98mB_F88gwMncKNMg/view?utm_content=DAFS18XeePg&utm_campaign=designshare&utm_medium=link&utm_source=homepage_design_menu</p>

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By Teacher Alina Ștefănescu, Kindergarten No.13, Targoviste, Romania

ACTIVITY/LESSON TITLE	„TRAVELLING THROUGH THE UNIVERSE!”
TARGET GROUP	Age of the kids: 5-6 years Level of education: preschool
DURATION	3 days
LEARNING ENVIRONMENT	Indoor (classroom) Small groups and individual work In the dedicated area of Thematic Centre will be exposed pictures of the Solar System and a project map. The classroom will be organised in 7 activity centres (Literacy, Art, Science, Mathematics, Building Materials, Roleplay, Sand and Water).
STEAM & SEL COMPETENCES	<input type="checkbox"/> Knowledge about the natural world <input checked="" type="checkbox"/> Mathematical and scientific language <input type="checkbox"/> Numeracy <input type="checkbox"/> Spatial thinking <input type="checkbox"/> Basic science concepts <input type="checkbox"/> Computational thinking <input type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Tech Literacy

	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Communication <input type="checkbox"/> Digital literacy <input type="checkbox"/> Asking meaningful questions <input type="checkbox"/> Information management skills <input type="checkbox"/> Drawing motivated conclusion <input checked="" type="checkbox"/> Problem solving <input type="checkbox"/> Creative Thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Collaboration <input checked="" type="checkbox"/> Confidence & Assertiveness <input type="checkbox"/> Curiosity <input type="checkbox"/> Integrity <input checked="" type="checkbox"/> Empathy
<p style="text-align: center;">EXPECTED LEARNING OUTCOMES</p>	<ul style="list-style-type: none"> ● Enrich children`s knowledge about the universe, planets, galaxies, the Sun, and the Moon. ● Foster children's interest and curiosity in their environment. ● Enrich vocabulary with new words and expressions related to the project's theme such as cosmos, solar system, planets, orbits, constellations, moon phases, and eclipses. ● Develop skills in conducting experiments. ● Identifying more solutions for the inquired STEAM project.
<p style="text-align: center;">SUBJECTS AND TOPICS COVERED</p>	<p>Science, Mathematics, Art, Language, Technology, Engineering.</p>
<p style="text-align: center;">METHODOLOGIES</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Design Thinking <input checked="" type="checkbox"/> Inquiry Based Learning <input type="checkbox"/> Problem Based Learning <input type="checkbox"/> SCAMPER

	<input type="checkbox"/> Montessori 3-stage lesson
<p>TOOLS/MATERIALS/RESOURCES</p>	<p>Earth globe, telescope, "My first encyclopedia", "Children encyclopedia", books, magazines, atlases, 3D glasses, toy projector, Earth mold, magnifying glasses, lighting table, designed little stones, buttons, shadow game, planets shape, laptop, video projector, markers, paper, watercolours, coloured sand, puzzle, coloured sticks, coloured beans, blue plates, illustrated recipe.</p> <p>Online movie about Solar System https://www.youtube.com/watch?v=XIBlVNtzymU</p> <p>Paxi is on Moon exploring : https://www.youtube.com/watch?v=2jVsuVZbez8</p>
<p>DETAILED STEP-BY-STEP DESCRIPTION OF THE ACTIVITY / SEQUENCES OF THE UNITS</p>	<p>STEAM ELEMENTS THROUGH THEMATIC PROJECT:</p> <p>SCIENCE:</p> <ul style="list-style-type: none"> ✓ Planets diversity and similar characteristics <ul style="list-style-type: none"> ✓ Planet's and satellite's structure ✓ Experiment- floating, diving, sliding on wet surface ✓ Solar system curiosities. <p>TECHNOLOGY:</p> <ul style="list-style-type: none"> ✓ Using measurement instruments: centimeter, unstandardized measurement units ✓ Using magnifying glass /photo camera ✓ Using audio-visual technology and internet <p>ENGINEERING:</p> <ul style="list-style-type: none"> ✓ Building space rockets/ spaceships/ flying saucers ✓ Building „Three-dimensional Universe” <p>ART:</p> <ul style="list-style-type: none"> ✓ Making of plastic and practic works individually and collective ✓ Audition of a music songs collection as well as a part of a classic area ✓ Making of an eurhythmics momment.

MATHEMATICS:

- ✓ Classification
- ✓ Numeration
- ✓ Formation of mathematical sets.

In the dedicated area for **Thematic Centre**, the project map will be exposed and in the same time, on a table, other materials will be displayed.

In the first day, I started the activity by showing the children a piece of material in three colours (yellow, red and orange). I addressed the children the following question to stimulate them to investigate: What are you thinking of when you look at this piece of material? I asked them to make some predictions about what they observed, using the brainstorming method. After that, the preschoolers had the task of searching for similar objects with the same shape and colour as the presented material. Following the observation and investigation of the objects chosen by the kids, predictions have been made and as a result, they found out the colour spots are in fact, balls.

After the pupil's answers, I presented a mould with a section of the Earth as a result the children associated with the presented material at the beginning of the activity.

In the next 2 days, children played in different areas of the classroom:

SCIENCE CENTRE - pre-schools observed the planets of the Universe through a rotating Solar System. The teacher together with the kids discussed the planets' features and some information was given to preschoolers about the subject. Also, they act as a small researcher using the magnifying glass and their senses to discover a Solar System made of unconventional materials.

Another task was to make a new experiment named „Magic galaxy”. For this, the necessary materials for children were: a bottle of water, cotton pieces, glitter, watercolour, water, little

	<p>stars and...a lot of imagination. All pieces, the planets”, „ the stars”, „celestial forms” will move as in the Universe.</p> <p>MATHEMATICS CENTRE- pre-schools performed exercises using small material,, Counting planets”(numbering 1-8).</p> <p>BUILDING MATERIALS – the task was to build space rockets and flying saucers made of coloured sticks.</p>
<p>INTEGRATION OF ART</p>	<p>In ART CENTRE children painted the Earth globe using the stamping by corks technique.</p> <p>During the practice activity, pupils made the Solar System using modelling clay. Also, another practice activity theme was called „My Constellation”. In order to get done with this work, preschoolers needed one piece of paper, pencils, small stars, plastic beads, and pasta stars.</p> <p>Children will draw on the paper a constellation shape, arrange the materials on drawing corners and finally choose the constellation name.</p> <p>At the end of the activity, the project „Traveling through the Universe” has been closed with an eurhythmics moment - „Stars dance”(background - „Fantastic symphony” by H.Berlioz). Also, the children listened a collage of songs about the planets- – Eight Planets and more Space Songs Pinkfong Songs for Children https://www.youtube.com/watch?v=WApvQ8yp5WE&t=41s</p>
<p>GENDER SPECIFIC ASPECTS OR STRATEGIES FOR INCLUSION OF DISADVANTAGE STUDENTS</p>	<p>This project implies both preschoolers gender, boys and girls being part of center activities, as well as working in small teams.</p>
<p>FEEDBACK AND ASSESSMENT</p>	<p>The evaluation of the project was done through:</p>

	<ul style="list-style-type: none"> ➤ an exhibition for preschoolers` art crafts organised in the kindergarten area; ➤ making a thematic photo album of activities which were developed; showing in front of the parents the movie „Travelling through the Universe” ➤ taking a tour of Astronomical Observatory „Amiral Vasile Urseanu” from Bucharest. <p>At the end of the activity, the teacher gave her appreciation regarding the kids' ideas and encouraged them to make connections between previous experiences.</p> <p>The teacher also offered a feedback to pre-schoolers about strengths and weaknesses, helping them to evaluate their activity.</p>
<p>EVALUATION(FOR PURPOSES OF GRADING)</p>	<p>Not the case.</p>
<p>LESSON PLAN WAS IMPLEMENTED?</p> <p>IF SO, PLEASE EXPLAIN THE PROCESS (DURATION, AGE LEVEL)</p>	<p>This project has been inserted to pre-schoolers aged between 5 and 6 years. Insertion period was three days.</p>
<p>IF THE ANSWER IS AFFIRMATIVE, PLEASE DESCRIBE A SHORT EVALUATION(STRENGTHS AND WEAKNESSES)</p>	<p>STEAM education represents a constructive and applied approach, using the concept children are learning by doing. Preschoolers answer to new challenges, and frame new ideas, and conclusions, for when they are about to reach school will be already familiarised with this type of education which learned it in kindergarten.</p> <p>STEAM activity is a challenge for the teacher as well as for preschoolers.</p> <p>Planning a STEAM project needs additional time from the teacher in order to have elaborate research, for innovative teaching resources according to the proposed thematic project</p>

	<p>with the aim of following step-by-step investigation („Inquiry based learning” method).</p> <p>Strengths: Little researchers, engineers, artists, and mathematicians are the beneficiaries of these innovative methods, teaching resources and material base with experimental purpose, investigation and critical thinking stimulation.</p>
INTELLECTUAL PROPERTY RIGHTS/ORIGIN OF THE ACTIVITY	<p>Activity link: https://www.canva.com/design/DAFTseFKPKo/palRVpkAYdr-fp9IT8TFZA/view?utm_content=DAFTseFKPKo&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton</p>

NGSS Lesson Plan (Bulgaria)

By Pavlina Simeonova, kindergarten "St. St. Cyril and Methodius", town of Dve Mogili (Ruse county), Bulgaria

TITLE OF THE LESSON / ACTIVITY	PAPER - HOW IS IT MADE?
TARGET AUDIENCE	<p>Preschool age, third age group 5-6 years old</p> <p>There are no specific requirements for children. Children with SEN /autistic spectrum/ are included</p>
DURATION	3 classes
LEARNING ENVIRONMENT	Indoors, tables are arranged comfortably for group work
<p>STEAM & SOCIAL-EMOTIONAL COMPETENCIES</p> <p>(CHECK APPLICABLE COMPETENCIES)</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Knowledge of nature <input type="checkbox"/> Mathematical and scientific language <input checked="" type="checkbox"/> Counting <input type="checkbox"/> Spatial thinking <input type="checkbox"/> Basic scientific concepts <input type="checkbox"/> Computational thinking <input type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input type="checkbox"/> Technical literacy <input type="checkbox"/> Assignment skills <input type="checkbox"/> Digital literacy

	<ul style="list-style-type: none"> <input type="checkbox"/> Meaningful questions <input type="checkbox"/> Information Management <input type="checkbox"/> Reasoned conclusions <input type="checkbox"/> Solving problems <input type="checkbox"/> Creative thinking <input type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Communication <input checked="" type="checkbox"/> Confidence and assertiveness <input checked="" type="checkbox"/> Cooperation <input checked="" type="checkbox"/> Honesty <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p style="text-align: center;">EXPECTED RESULTS/GOALS</p>	<p>At the end of the lesson, children should:</p> <ul style="list-style-type: none"> • They know the principle of making paper; • Have a responsible environmental behavior towards the use and recycling of paper; • They can make handmade paper in domestic conditions /with the help of an adult when using an electrical appliance; • They can make a greeting card from a handmade paper
<p style="text-align: center;">STUDY SUBJECTS AND TOPICS</p>	<p><u>Mathematics</u> – the children reinforce their knowledge of quantity. And measure paper quantity and quantity liquid. During the production of the greeting cards, students reinforce their knowledge of the geometric figures square and rectangle;</p> <p><u>Environment</u> – children learn responsible environmental behavior. They know different human activities for taking care of nature. They know how to recycle old paper into new paper;</p>

	<p><u>Arts</u> - make and decorate a greeting card. They strengthen their skills to compose elements in two-dimensional space. They acquire a sense of aesthetics;</p> <p><u>Bulgarian language</u> – the children enrich their vocabulary while communicating in group work. They strengthen their storytelling skills, show emotion when presenting their favorite book. They learn to present.</p>
<p>METHODS</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Design thinking <input type="checkbox"/> Learning through inquiry <input type="checkbox"/> Problem-based learning <input type="checkbox"/> SCAMPER <input type="checkbox"/> The 3-step Montessori lesson
<p>TOOLS / MATERIALS / RESOURCES</p>	<p>Children's books, advertising brochures, used notebooks, blender, sieve, cheesecloth, absorbent sponge, flower seeds, dried flowers, food coloring, colored pencils, felt tip pens, scissors, glue, colored paper.</p>
<p>DETAILED DESCRIPTION</p>	<p>In the first pedagogical situation, children are introduced to the topic by talking about their favorite books and characters. Different types of books - encyclopedias, puzzle books - can be given to them to look at and discuss, coloring books, etc. Gradually, with questions, they turn to the topic of paper and do they know how and what it is made of. They are shown a woody twig, on which the bark is peeled so that the children can see the wood fibers. Looking at favorite books and actually touching wood fibers is very emotional for children. To calm the group down, a short, animated video about the origin of the paper is provided. When and where in our daily life we use paper and what we do with the used paper is discussed with the children, thus directing their attention to ecology and recycling. A task is given that for the</p>

	<p>next time everyone should bring an advertising brochure, a used notebook, an old newspaper, etc.</p> <p>The second situation begins with a discussion of where in your daily life you use paper and what we do with the old, already used paper. I update their knowledge of why we should recycle paper and how we thereby protect nature. The children are offered to turn the old used paper into a new one to make a beautiful greeting card for their moms. I show the course of action, explaining why we do each thing. First, each child tears up an old piece of paper. Then, they measure two cups of torn paper, and 1 cup of water, with which students pour on the paper. They put the wet paper in a blender and grind it to obtain paper pulp. At this stage, children wishing to color paper, add some food coloring. The resulting paper pulp is poured into a basin with water. Children scoop out the mash with a sieve. After that, they carefully soak the resulting sheet with an absorbent sponge and they turn it over on a sheet to dry in the sun. Here children, who wish, can decorate with dried flowers and seeds. At the end of the situation they are given a task to think about their own card design.</p> <p>The third situation begins by looking at different greeting cards. Children discuss what they like, share and discuss their designs as well who they will give it to and why. The moment is very emotional as each child prepares the card for their loved and significant adult. Every child chooses and picks the necessary according to their idea - pencils, felt tip pens, scissors, glue, colored paper, etc. and proceed to realize their ideas.</p>
<p>ROLE OF THE ARTS</p>	<p>Children learn aesthetics. They learn to distribute decorative elements in two-dimensional space. They decorate the handmade paper with seeds, dried flowers, food coloring. Combine colors.</p> <p>They prepare designs on a greeting card and demonstrate aesthetic taste in decorating.</p>

<p>STRATEGIES FOR INCLUSION OF GIRLS AND DISADVANTAGED STUDENTS</p>	<p>In the implementation of these activities, there are no prerequisites for stereotyping the roles or excluding girls. All children are given equal opportunities to tell about their favorite book, to answer the questions, to decorate their handmade paper according to their own desire.</p> <p>When making the handmade paper and the greeting card, children with SEN are involved on an equal basis with the others and according to their own capabilities and desires.</p>
<p>FEEDBACK</p>	<p>Assessment is done during the work by observing the children. The stories about the favorite books, which are often the same, are emotional. Care should be taken to avoid any controversy about literary characters, and explain the right of everyone to like one character or another. Children can be asked to guess what the favorite book of the non-verbal children with SEN is based on their observations during bedtime reading and the positive reactions of children with special needs. This will teach them acceptance of difference and empathy.</p> <p>Making handmade paper itself is very emotional and fun, as at first kids tear paper to prepare it for recycling, and then work with water. Water activities are therapeutic and we can let the kids have a few tries at scooping up the paper pulp as well as decorating with leaves, seeds and food coloring. In this activity, which is purely manipulative, it's okay to observe children with SEN and their emotional reactions.</p>
<p>EVALUATION</p>	<p>Assessment is done by observing the children during the activities. The degree of understanding of the instructions is ascertained. The final lesson form, where the children design a greeting card and decorate it, begins with a conversation with questions aimed at establishing to what extent the children have understood the way of paper production, the need to recycle paper, the way of making paper at home.</p>

<p>HAS IT BEEN IMPLEMENTED/TESTED OR NOT?</p> <p>IF YES, PLEASE EXPLAIN THE PROCESS (IMPLEMENTATION DURATION, EVALUATIONS, PROCESS)</p>	<p>The lesson was implemented with the third group "Winnie the Pooh" in 2022. In the group, 4 children with SEN /GRD and autism spectrum disorder/ are taught, who usually show little or no interest in the educational activities in the group.</p> <p>The duration is three pedagogical situations. Care should be taken to ensure that the questions of the introductory talks are specific and not to deviate from the topic, while at the same time giving all children the opportunity to speak.</p> <p>In the first situation, the children gained theoretical knowledge of the topic and shared their knowledge gained in other life situations.</p> <p>In the second situation, the children practically applied their knowledge and manipulated paper and water to make handmade paper.</p> <p>In the third situation, individual designs, their pros and cons were discussed. A high emotional charge of the activity was achieved with sharing who will receive the cards and why. The children put their ideas into practice.</p> <p>The lesson is suitable for including children with SEN.</p>
<p>IF YES, PLEASE WRITE YOUR OPINION/RATING? (CONSTRAINTS ON TIME, COMPLETION OF OBJECTIVES, ETC.)</p>	<p>The topic was well received by the children, it provoked their curiosity. They looked forward to every next situation.</p> <p>During the first situation, the children with SEN showed no interest, getting up and starting activities according to their current mood. This was due to the fact that children are non-verbal. During the second situation - tearing the paper and working with water, they joined the others themselves without being invited. Observing and imitating the other children, they began to tear the paper. They really enjoyed themselves while working with water and with some guidance from me and the other children they managed to make their hand paper. During the third greeting card situation, their interest was much lower</p>

	<p>than the paper and water task, but not lacking as in the first situation.</p> <p>As a limitation, we can accept the difficult and unnecessary provision of a blender and sieve for each child. They used a blender and a sieve, waiting to use them.</p>
<p>INTELLECTUAL PROPERTY (IPR) / ORIGIN OF THE LESSON (CLASS)</p>	<p>NonCommercial (nc)</p> <p>The tutorial may be copied, distributed, displayed, performed and modified for any purpose other than commercial.</p>

NGSS Lesson Plan (Bulgaria)

By Radka Georgieva - Gineva, Primary school "Dr. Petar Beron", village of Zhelyu
Voyvoda (Sliven Municipality)

TITLE OF THE LESSON / ACTIVITY	SUBJECT: MAN AND NATURE SECTION SEVEN: MAN AND THE HEALTHY LIFESTYLE LESSON TOPICS: 1. HEALTHY LIFESTYLE. 2. OUR HEALTH - STRENGTHENING. 3. MAN AND HEALTHY LIFESTYLE - SUMMARY.
TARGET AUDIENCE	<p>4th grade</p> <p>Age of students: 10 – 11 years</p> <p>Characteristics of learners: A differentiated approach is applied, which makes it possible to work effectively with heterogeneous groups of students in one common class, at the same time in a normal and everyday teaching process, making the learning content applicable to different types of students. In the differentiated approach, the class can be divided into groups according to similar educational needs to facilitate the learning process according to the needs of the students.</p>
DURATION	<p>The lesson takes place in three consecutive classes.</p> <p>Each class lasts 40 minutes.</p>
LEARNING ENVIRONMENT	<p>The educational activity takes place in the IT cabinet.</p>
STEAM & SOCIAL-EMOTIONAL COMPETENCIES	<ul style="list-style-type: none"> <input type="checkbox"/> Knowledge of nature <input type="checkbox"/> Mathematical and scientific language

	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Counting <input checked="" type="checkbox"/> Spatial thinking <input checked="" type="checkbox"/> Basic scientific concepts <input type="checkbox"/> Computational thinking <input checked="" type="checkbox"/> Observation <input type="checkbox"/> Mathematical models <input checked="" type="checkbox"/> Experimentation <input checked="" type="checkbox"/> Technical literacy <input checked="" type="checkbox"/> Assignment skills <input checked="" type="checkbox"/> Digital literacy <input checked="" type="checkbox"/> Meaningful questions <input checked="" type="checkbox"/> Information Management <input checked="" type="checkbox"/> Reasoned conclusions <input checked="" type="checkbox"/> Solving problems <input checked="" type="checkbox"/> Creative thinking <input checked="" type="checkbox"/> Responsible decision making <input checked="" type="checkbox"/> Communication <input checked="" type="checkbox"/> Confidence and assertiveness <input checked="" type="checkbox"/> Cooperation <input checked="" type="checkbox"/> Honesty <input checked="" type="checkbox"/> Curiosity <input checked="" type="checkbox"/> Empathy
<p>EXPECTED RESULTS/GOALS</p>	<p>EXPECTED RESULTS:</p>

	<ul style="list-style-type: none"> ● Name and indicate on the image cells, organs, system of organs and their functions, disabilities and diseases of the human organism; ● Recognize in text or image organs, systems of organs and vital processes in the human organism; ● Compare life processes in animals and humans according to selected characteristics; ● Describe rules for prevention and a healthy lifestyle; ● Analyzes connections and dependencies between body condition, health prevention and lifestyle; ● Extract and present information from/through text, simple models, diagrams, graphs, tables, as well as through information and communication technologies; ● Perform on site observations; ● Evaluate and support activities aimed at protecting personal and public health and the environment. <p>GOALS</p> <ul style="list-style-type: none"> ● Recognize the organs of the human body related to the processes of eating and breathing in a diagram. ● List the main substances needed by the human body and the foods that contain them. ● Give examples of healthy eating. It indicates the causes of infectious diseases /microbes, bacteria, viruses/ and the means of prevention and treatment/personal hygiene, vaccines, medicines/. ● Appreciate the importance of healthy eating, personal hygiene, physical activity and fitness to strengthen and protect one's health. ● Explain the harmful effects of nicotine, alcohol and drugs.
<p>STUDY SUBJECTS AND TOPICS</p>	<ul style="list-style-type: none"> ● Computer modeling and information technology: <ul style="list-style-type: none"> - solving interactive tasks on the platform LearningApps.org., Liveworksheets.com and the possibility of creating similar exercises; ● Using 4D educational maps - The human body;

	<p>- Using the Magic T-Shirt application - a new educational material with the help of which the human body is studied with interest and ease. Through the Body planet t-shirt you can see the inside of the body - all the organs, in full size, with a 3D effect, with movement and a real look.</p> <ul style="list-style-type: none"> ● Fine art - each student will try to draw/sketch a model of a daily diet; ● Music – while the students work there is background music with classical music, as surgeons do in operating rooms while they work; ● Bulgarian language and literature - development of communicative abilities and way of expression and presentation. Each student will present his or her scientific doctoral thesis from the conducted mission; ● Man and society - information about famous persons related to the medical profession, inventions, researchers; ● Mathematics - Calculation of BMI; ● Physical education and sports - a healthy lifestyle through sports and proper nutrition.
<p>METHODS</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Design thinking <input checked="" type="checkbox"/> Learning through inquiry <input checked="" type="checkbox"/> Problem-based learning <input type="checkbox"/> SCAMPER <input type="checkbox"/> The 3-step Montessori lesson
<p>TOOLS / MATERIALS / RESOURCES</p>	<ul style="list-style-type: none"> ● Reflection -We use the tool "In the shoes of...", which is the best way for students to see the world through the eyes of the relevant profession - "Doctor". In other words, this way we will not only see, but also feel what it is like to be someone else. The ultimate goal of this tool is to deepen our empathy for people in a given field and thus help us create more adequate and innovative products and services. To make good use of this tool, we need to keep several things in mind:

	<ul style="list-style-type: none"> • To meet with professionals, if possible, to visit him/her at his/her place of work to see the real world; • If we have the possibility, to bring appliances, tools, supplies from the profession that we can give the students to touch and use. • Use of a presentation to illustrate the lesson; • Use of tablets within advance downloaded applications for working with 4D educational cards - the human body and 3D T-shirt - the human body; • Pre-selected exercises on the platform learningapps.org, liveworksheets.com, wordwall.com, etc.
<p>DETAILED DESCRIPTION</p>	<p>Day 1</p> <p>Lesson 65 –Healthy lifestyle</p> <p>GET-TO-KNOW AND EXPLANATIONS – 5 min.</p> <p>Greetings from the teacher and introducing the students to the "HEALTH" Mission. Students receive information about the procedure with clear guidelines and criteria.</p> <p>I CHOOSE TO BE – 5 min.</p> <p>On the first day of the mission, a parent who is a doctor is visiting us / if there is not one, he can be invited/. He has prepared a brief introduction to the profession, where and how he works, what it takes to work as a doctor and how a day goes by.</p> <p>After this presentation, students can ask questions and we will move on to the essential part, which is the structure and functions of the digestive system.</p> <p>DEMONSTRATION WITH 3D T-SHIRT - THE HUMAN BODY - 10 min.</p>

A presentation has been prepared to illustrate the material, but to make the information even more realistic, we move on to a demonstration with a Magic T-Shirt - Appendix #2. One of the students puts on the t-shirt and another, using a tablet and a pre-downloaded Magic T-Shirt app, visualizes the digestive system.

A process of examination, explanation, questions, making sense of what was seen and received information begins. Enthralled by the 3D reality, students go on to consolidate knowledge about the human digestive system and move on to the main topic of the harm that nicotine, alcohol and drugs do to human health.

In the form of challenges/online worksheets/, the students confirm and summarize the information about the importance of the daily regime for health, about the importance of alternation of mental and physical work, about sports and active rest.

After successful solving, Day 2 - MISSION "HEALTH" will be unlocked.

APPLICATION - SOLVING INTERACTIVE TASKS – 15 min.

The worksheets are pre-selected from various educational sites:

- <https://www.liveworksheets.com/qc2631748lx>
- <https://www.liveworksheets.com/sm3287759kt>
- <https://www.liveworksheets.com/rq427135bj>
- <https://www.liveworksheets.com/fx324727xe>
- [Wordwall](#)

Additional tasks:

- [Wordswall 2](#)
- [Worldwall 3](#)
- [Worldwall 4](#)
- [Worldwall 5](#)

SHARE - WORK ANALYSIS AND REFLECTION – 5 min.

The teacher, in the role of director of a hospital, gives the floor to each of the students to share their impressions and comment on what is happening during the lesson. After the feedback received, students receive a key to the next stage. They get a piece of the puzzle, you picture the digestive system in the human body. Those who got the same pieces are grouped into one team for the next hour. However, two of them get a jar of honey and yogurt to prepare a food test.

Day 1 is successfully completed and you can proceed to the next level in MISSION "HEALTH".

Day 2

Lesson 66 -Our health - strengthening**GET-TO-KNOW AND EXPLANATIONS – 4 min.**

Greetings from the teacher and introducing the students to the "HEALTH" Mission, Day 2.

Students receive information about how the lesson is going.

I CHOOSE TO BE – 15 min.

The head of the department wants urgently to list, study and describe an exemplary daily regime and rules for a healthy lifestyle and what the consequences of the use of nicotine, alcohol and drugs can be on the human body. For this purpose, he formed 5 teams for rapid response, each of them receiving a key - a card with 4D augmented reality - Appendix #3:

General guidelines for team work:

- Select information from various sources on how to temper.
- Form it into small leaves, in a form suitable for gluing on a board.
- Select photos showing tempering methods.
- Discuss the mode of presentation.
- Arrange them on a white sheet in a manner of your choice.

Teams:

- Language. Oral Cavity - Team 1 "Tempering"

Operating instructions: Write a short text about the importance of tempering in strengthening and protecting one's health.

- Mouth. Oral Cavity - Team 2 "Healthy Eating"

Operating instructions: Compose healthy menu for breakfast, lunch and dinner. It can be represented by a drawing.

- Stomach. Front View - Team 3 "Sport"

Operating instructions: Compose rules to prevent injuries and accidents during sports.

- Gut. View In front – Team 4 "Personal hygiene"

Operating instructions: Drawing up rules for maintaining personal hygiene.

- Liver. Front View - Team 5 Harmful Substances

Operating instructions: Compose short text about the harm of the use of these substances on the human body.

After doing their research, the teams have to present their reports to the audience. The final materials can be made into a special class booklet related to a healthy lifestyle.

While the study is going on, two students are preparing for a demonstration.

I CREATE - DEMONSTRATION "USEFUL FOODS" - 6 min.

- EXPERIENCE WITH SOUR MILK – 3 min.

Student - chemical laboratory assistant, performs the experiment. He explains that yogurt is one of the most useful traditional Bulgarian foods, but unfortunately, it is very rare to find natural yogurt on the market - one without thickeners and enhancers. The most common additives in yogurt are: starch, salt, sugar and milk powder. Starch can be "caught" very easily with an experiment: take a spoonful of yogurt, drop 2-3 drops of iodine tincture on it and wait a few minutes. Milk that has been thickened with starch will change color to blue-purple. If there is no starch in the milk, the characteristic brown color of iodine will remain in place of the iodine drops. A demonstration follows, two products are used: yogurt brand - Sayana and brand - Elena. After performing the experiment, it is proved that one of them has a starch content.

- EXPERIMENTS WITH BEE HONEY – 3 min.

A second student takes on the role of a chemical laboratory assistant and performs an experiment with honey. He explains that the quality of honey can also be checked at home. Manipulated honey most often contains water and glucose. Pure honey placed in a glass of water sinks to the bottom and settles, while manipulated honey quickly dissolves and does not sink. When heated in a metal pot, the real one does not foam and caramelizes quickly, and this proves that no water has been added. A test can also be done with a drop of real honey, dropped on a napkin or blotting paper, it will retain its shape.

In turn, fake honey will spill over the napkin and a layer of water will form along the contours of the drop. A sequential performance and demonstration of the three trials follows. Three different brands of honey are used. Through the first experiment, it was found that one of them contains glucose. The second attempt to prove water - the result proves water content in two of the types of honey. In the third attempt of dripping onto a napkin, only the contents of one type of honey retained its shape.

SHARE - WORK ANALYSIS AND REFLECTION – 15 min.

The teacher, in the role of director of the hospital, gives the floor to each of the teams to share their impressions and comment on the work of the others, following the following scheme:

1. "Where are we now" - Each team briefly describes what they have done so far.
2. "I like it" - After the team has introduced itself, say something positive about the work of the other teams.
3. "I would like to ..." - Constructive criticism is given here.
4. "Thank you" - Feedback is a gift. No comments are made, only thanks are given for her.

Teams are given a key to the next stage by receiving a letter describing that they have been approved for the assignment they have applied for and must report to work as a nurse, dietician, emergency room doctor, GP, respectively, which confirms that Day 2 has been successfully implemented and can proceed to the next level in MISSION "HEALTH".

Day 3**Lesson 67 -The person and the healthy lifestyle - summary.****GETTING TO KNOW AND EXPLANATION – 3 min.**

Greetings from the teacher and introducing the students to the "HEALTH" Mission, Day 3.

Students receive information about how the lesson is going.

The class is divided into 3 teams, including:

Team 1 – a total of 9 students participate

- Specialists who work at the registry/nurses /3 students/,
- General practitioners - jeeps /3 students/ and
- Patients /3 students/.

Team 2 - a total of 9 students participate

- Specialists who work at the registry/nurses /3 students/,
- Specialists from the "Nutrition and Dietetics" office - nutritionists /3 students/,
- Patients /3 students/.

Team 3 - a total of 9 students participate

- Specialists who work at the registry/nurses /3 students/,
- Doctors in emergency department /3 students/,
- Patients /3 students/.

The teacher - director of the hospital, specifies that the students take on the roles of young doctors who are placed in real life situations and have very responsible tasks: to show the knowledge they have acquired. The task of the doctors is explained, to carry out the necessary examinations of the patient, to make an accurate diagnosis, to explain the details of his condition, to prescribe treatment and, if necessary, to refer him to another specialist.

In order to motivate the students' work, emphasis is placed on the fact that the patient trusts only the knowledgeable and capable doctor and the one who treats him kindly.

I CHOOSE TO BE – 30 min.

ROLE PLAY - №1 - AT THE PERSONAL DOCTOR - 10 min

The role-playing simulation takes place in the GP's office. Three students are at the register, three are taking on the role of GPs and another three are taking on the role of patients.

Patient #1

A patient comes in with the following complaints: runny nose; sore throat; cough; fever; lack of smell, stomach pain, bloating, gas.

Patient #2

The patient has transient pain (sensitivity) of the teeth from chemical, thermal or mechanical irritants and the registry refers him to the general practitioner for a referral to a dentist and examination.

Patient #3

The patient complains of abdominal pain, constipation, bloating and diarrhea. The registry directed him to contact his personal physician for an examination.

ROLE PLAY - №2 - IN THE NUTRITIONIST'S OFFICE - 10 min

The role-playing simulation takes place in the "Nutrition and Dietetics" office. Three students register the complaints of three patients and refer them to specialist nutritionists.

Patient #1

has an elevated blood sugar value; Overweight. The specialist nutritionist calculates the BMI based on the data taken from the patient and comparing it with the values from the table that is presented, they find that the patient is obese first degree and this is a prerequisite for diabetes mellitus.

Patient #2

The patient very often says that he is not hungry and refuses to eat with his family and friends. After eating, he goes to the toilet and vomits what he has eaten. Loses interest in current hobbies

and indulges only in those activities that are somehow related to weight or food. He is usually irritable and careless. He is withdrawn and often in a bad mood, which can border on depression. There are sudden mood swings. Performance at school or work worsens.

Patient #3

The patient has decreased weight, an unrealistic perception of appearance, obsessive fear of gaining weight, weight control through voluntary fasting, induced vomiting, excessive use of laxatives and diuretics.

ROLE PLAY - #3 - IN THE EMERGENCY DEPARTMENT - 10 min

Patient #1

The patient has burning pain in the stomach area, nausea, lack of appetite and a premature feeling that he has eaten and the appearance of blood in the stool. The patient also consumes large amounts of alcoholic beverages.

Patient #2

The patient has muscle pain, nervousness, dehydration and unusual behavior.

Patient #3

The patient is 35 years old with shortness of breath, nausea and vomiting and a cold sweat. He has been a smoker for 20 years.

SHARE - WORK ANALYSIS AND REFLECTION – 7 min.

At the end of the mission, students self-assess their achievements using pre-set criteria using an interactive traffic light.

And finally, they familiarize themselves with the Hippocratic Oath and promise, like real doctors, to observe and apply what they

	<p>have learned with attention and care, both to themselves and to those around them - their relatives, friends and acquaintances.</p> <p>Each student fills out an evaluation card - Appendix #1, on the basis of which he receives a "HEALTH MISSION" certificate.</p> <p>The enthusiasm to discover, experiment and learn about the world around you is captivating. Students are imperceptibly drawn in and thirst for adventure, wanting more and more of the beauty of knowledge. The process is constant and engaging, challenges and provokes them, which keeps them motivated and curious about the learning process.</p> <p>STEM, Design Thinking and Experiential Learning methods, as well as play, are key to the student's heart because we are born creators, moving what we learn from our heads to our hearts through our hands.</p>
<p>ROLE OF THE ARTS</p>	
<p>STRATEGIES FOR INCLUSION OF GIRLS AND DISADVANTAGED STUDENTS</p>	<p>Specially selected activities, exercises and tasks that put these children in an active position can be planned and developed.</p> <p>Example tasks, for disadvantaged students, in relation to the topic of the lesson on a healthy lifestyle:</p> <p>Task #1 from an individual worksheet: Look carefully at the picture, marking those foods that are beneficial and others that are harmful to dental health. Questions: Which of these foods is your favorite? Should you eat them often or not? What happens to your teeth if you overdo it with chocolate and lollipops?</p> <p>Task #2 from an individual worksheet: The student looks at an illustration of a food pyramid, in which foods are arranged according to their importance and benefit to organisms. The information is explained in a way accessible to the child.</p> <p>Task #3 from an individual worksheet: The student is presented with a diagram of the human body to color. The task is to color by</p>

	<p>choosing the correct colors, as well as to write the name of the individual organs with an arrow.</p> <p>Task #4 from an individual worksheet: Modeling: Look at the illustrations in the textbook and try to make a model of a heart or teeth or a mouth with plasticine.</p> <p>Task #5 from an individual worksheet: The student looks at an illustration of a daytime routine. The information is explained in a way accessible to the child. Its task is to record the activities that it performs in its daily life.</p>
<p>FEEDBACK</p>	<p>Feedback handles are detailed in the "Detailed Description" field.</p>
<p>EVALUATION</p>	<p>An example assessment matrix is used /Source: NASA/ - Appendix 1</p>
<p>HAS IT BEEN IMPLEMENTED/TESTED OR NOT?</p> <p>IF YES, PLEASE EXPLAIN THE PROCESS (IMPLEMENTATION DURATION, EVALUATIONS, PROCESS)</p>	<p>At the moment, the lesson has not been implemented, because the topics are at the end of the "Man and Nature" curriculum - topic 65, 66 and 67.</p>
<p>IF YES, PLEASE WRITE YOUR OPINION/RATING? (CONSTRAINTS ON TIME,</p>	<p>-</p>

<p>COMPLETION OF OBJECTIVES, ETC.)</p>	
<p>INTELLECTUAL PROPERTY (IPR) / ORIGIN OF THE LESSON (CLASS)</p>	<p>NoDerivatives (nd) You let others copy, distribute, display and perform only original copies of your work. If they want to modify your work, they must get your permission first.</p>

EDUCATIONAL MATERIALS/PRODUCT FORM⁴ (Bulgaria)

By Veronika Milcheva Gecheva, kindergarten "Nezabravka", city of Mizia (Vratsa county), Bulgaria

Type (name) of the material/product: Board game "Kingdom of Mathematics"

Subject/field of study: Mathematics

Level/grade (preschool, elementary): Preschool (5+)

Objectives of the material/product: Memory improvement. Learning through play.

Justification of the need for such material/product:

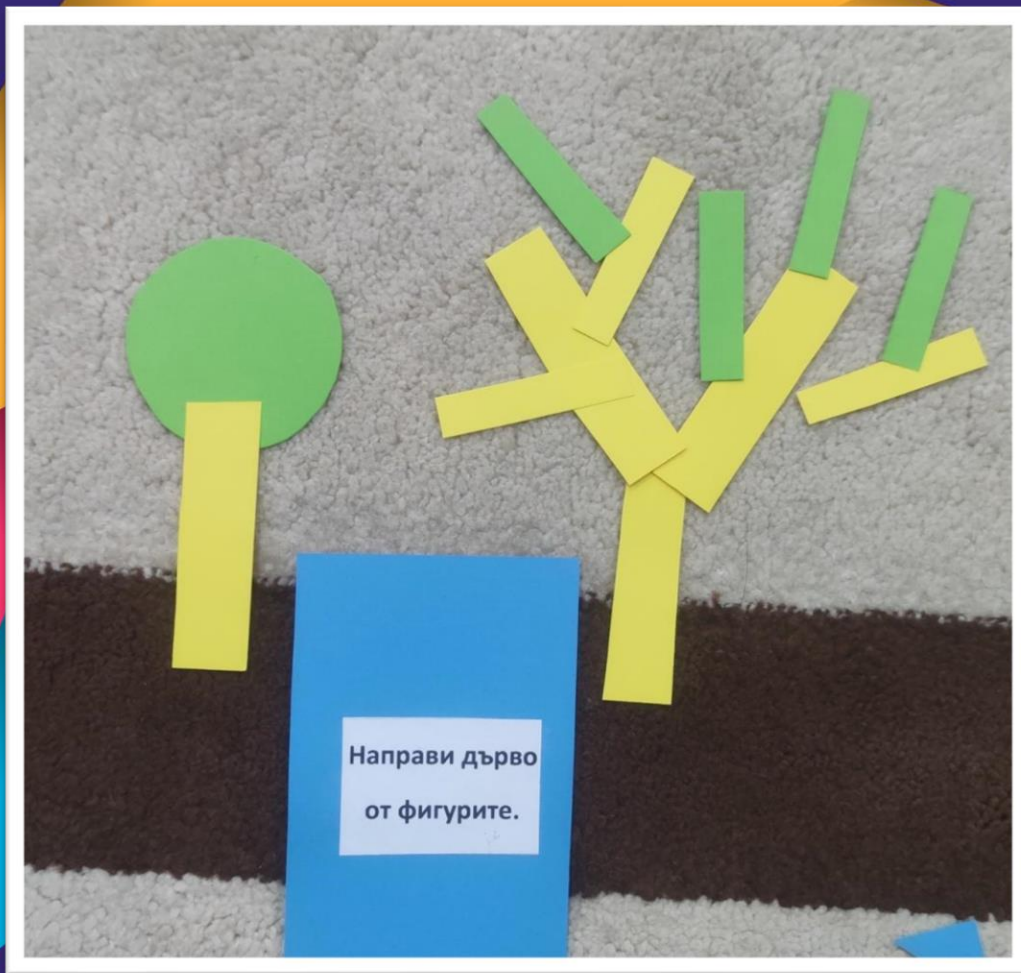
I developed the learning material in order to attract the attention of the children to the learning process. Learning and perceiving the content of mathematics through a game in accordance with the state educational standards. The game increases the interest and motivation towards mathematics. Through the various maps, the imagination develops, the intellectual development of children is stimulated, visual thinking develops, prerequisites for the development of logical thinking are formed, the basic educational content in mathematics is perceived and reinforced.

How is it applied in a learning environment? The game can be offered to children in activities of interest or for individual work with children.

Support/additional materials included in the product (video, prototype photos, etc.). Attach a link to the product if available.

⁴ Educational materials can be puzzles, graphics, charts, card sets, an online authoring resource, and other diverse resources that support learning through visualization, engage students, and/or prompt them to act, communicate, or collaborate.





Has it been tested/implemented?

The game was implemented with 5-6 year old children.

If yes, please describe the process (duration, evaluation, stages of implementation):

The duration of the game depends on the number of players and the speed of answering the questions. And also from whether they can handle the tasks. Through the questions from the cards, children absorb and improve their achievements in mathematics.

1. The game is played by 2 to 4 players.
2. The game begins by throwing the dice and the first turn is by the player who has drawn the biggest number.
3. Each player moves their pawns forwards according to the number on the dice.
4. If this place is taken already, the player moves their pawn on the next free place.
5. After the pawn is placed on a certain color, the player draws a card of the same color and follows the instruction on it.
6. If the player completes the task successfully, he/she keeps the card; if they don't- returns the card and skips a turn.
7. The winner is who reaches the final first.

If so, could you share your impressions of the product implementation? (challenges, compatibility with goals, working with children, etc.):

I implemented this game in the morning hours free from activities.

My observations are that most of the children were impressed and interested in the game. They coped excellently with the assigned tasks, constructed and had fun with the geometric figures. They built the construction tasks in different ways, according to their judgment and imagination.

I was very impressed by a child who is alert, knowledgeable and capable, but very distracted and violent. The game caught his attention so much that he played for a very long time and kept saying how nice and interesting it was. In ordinary situations, his attention is held for a short time and then he starts to wander, not paying attention and listening, talking and disturbing others. With this game the exact opposite

happened, he invited other children to play with him, he was focused, calm and looking forward to his turn again. **He helped his friends in trouble.**

I also made progress with two other children who had not attended kindergarten until now. At the beginning of the school year, they showed very low diagnostic results. We played the game and they joined in with interest when they didn't know how to answer some of the questions and the other kids helped them. I observed that they tried to remember new things for them, and so with each subsequent game they knew more and more and continued to learn something new. And in the construction tasks, they worked with interest and desire and were extremely creative.

The only failure I had was with a child who did not show interest, did not focus on the questions and did not show creative imagination with the construction cards - he was constantly waiting for someone to tell him exactly how to build a house, a tree or something else that he downloaded from the cards. But he was successful in counting the fields on the game because he was initially either skipping fields or counting a field twice.

For the next school year, I'm thinking of continuing to play the game by changing some of the questions on the cards and increasing the level of difficulty so that the children who are making progress can continue to stimulate their imagination, logical thinking and intellectual development.

I give my consent for the educational game "Kingdom of Mathematics" to be shared, used and applied by other teachers in the educational process.

NGSS LESSON PLAN (Poland)

By Urszula Lutak, School Complex in Wyzne, Poland

TITLE OF THE ACTIVITY	BUILD A HURRICANE PROOF HOUSE
AGE GROUP	7-11
DURATION	1-2 hours
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	The aim of this activity is to teach students about engineering and problem-solving. Students will learn how to build a house that can withstand a hurricane using simple materials like paper, straw, or cardboard. They will also learn about the importance of structural stability and how to test their creations
DESCRIPTION OF THE ACTIVITY	Students will work in groups to design and build a house that can withstand a hurricane. They will use simple materials like paper, straw, or cardboard to construct their houses. Once the houses are built, students will test their creations by turning on a fan to simulate a hurricane. The houses that remain standing will be declared the winners.
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	Paper, straw, or cardboard, scissors, tape, fan
REFERENCES, IF ANY (website – books)	https://carlyandadam.com/thecarlyandadam/hurricane-stem-challenge https://www.youtube.com/watch?v=6BOgna1KsxU

NGSS LESSON PLAN (Poland)

By Urszula Mita - School Complex in Ropczyce, Poland

TITLE OF THE ACTIVITY	DIY TURNTABLE: BECOME AN ARTIST
AGE GROUP	8-14+
DURATION	3-4 hour
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	<ul style="list-style-type: none"> Promote creativity and imagination Provide a hands-on experience in creating rotating art Explore the intersection of art and technology
DESCRIPTION OF THE ACTIVITY	<p>The assembly of the turntable is straightforward. Follow these steps:</p> <ol style="list-style-type: none"> 1. Take a piece of cardboard and cut a circle with a diameter of approximately 15cm. 2. Attach the motor to the center of the cardboard circle using tape or glue. 3. Connect the motor to a battery to provide power. 4. Place the paper or canvas on top of the turntable. <p>Once the turntable is assembled, you can begin creating rotating art:</p> <ol style="list-style-type: none"> 1. Put a marker or paintbrush on the rotating paper or canvas, ensuring it is steady. 2. Turn on the motor, and it will start rotating the paper or canvas. 3. Shift the center of the rotating paper or move the marker to create unique and creative drawings.

<p>MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS</p>	<ul style="list-style-type: none"> • Cardboard or other suitable materials for building the turntable • Motor • Battery • Paper or canvas • Markers or paint
<p>REFERENCES, IF ANY (website – books)</p>	<p>https://ai.thestempedia.com/project/diy-turntable-become-an-artist/</p>
<p>PICTURES OR VIDEOS UPLOADED</p>	<p>https://www.youtube.com/watch?v=5rLaa2YdkHI</p>

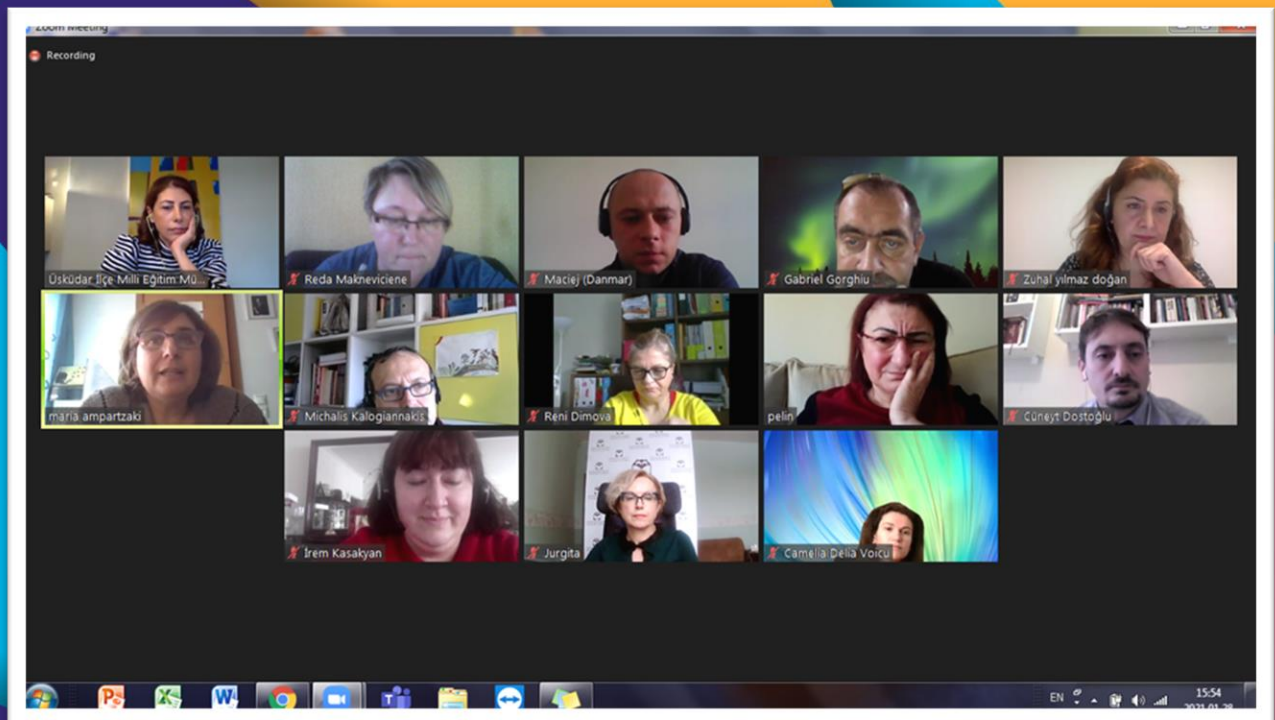
NGSS LESSON PLAN (Poland)

By Agnieszka Lesak - Primary School in Nowa Wieś, Poland

TITLE OF THE ACTIVITY	MAKING FIDGET SPINNERS
AGE GROUP	Primary school pupils 7-11
DURATION	1-2 hours
SETTING (OUTDOOR OR INDOOR)	Indoor
AIMS OF THE ACTIVITY	<ul style="list-style-type: none"> Promote creativity and imagination Provide a hands-on experience in creating a toy Explore the intersection of art and engineering
DESCRIPTION OF THE ACTIVITY	Students will work in groups to create their own fidget spinners using simple materials like cardboard, bearings, and markers. They will use their creativity and engineering skills to design and build their spinners. Once the spinners are built, students can test them out and see how long they can spin.
MATERIALS/RESOURCES/TECHNICAL REQUIREMENTS	<ul style="list-style-type: none"> Cardboard Bearings Markers Scissors Glue Coins
REFERENCES, IF ANY (website – books)	https://www.twinkl.pl/blog/10-steam-activities-for-elementary-students
PICTURES OR VIDEOS UPLOADED	https://www.youtube.com/watch?v=OLthvm6yOvY

Pictures of common activities



























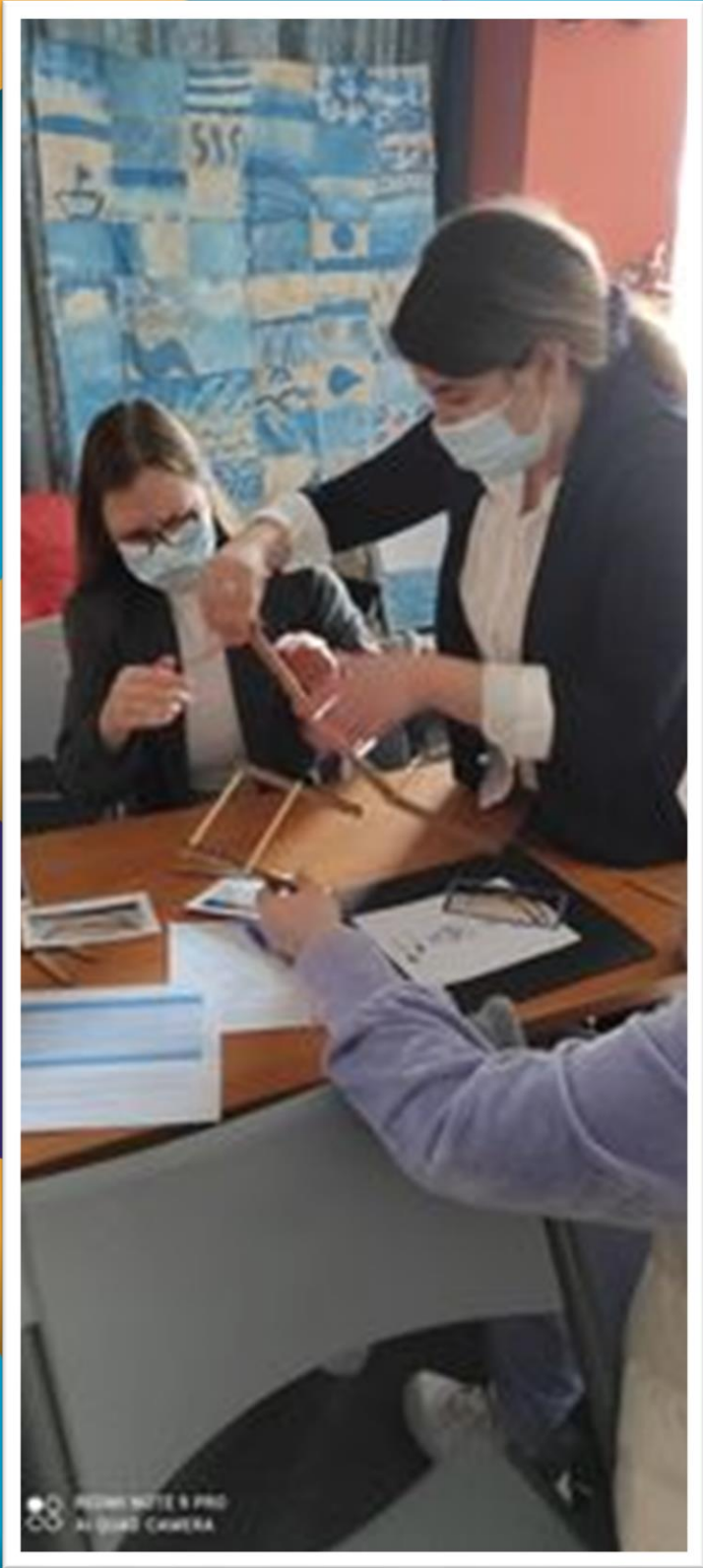












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