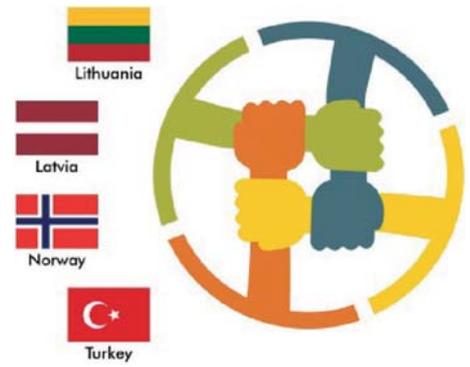




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Erasmus+ KA2 strategic partnership project's “Effective International Partnership: Success for Every Student”

Training (learning) measure for educators and parents



KAUNAS TEACHERS
TRAINING CENTRE



FITJAR VIDAREGÅANDE SKULE
HORDALAND FYLKESKOMMUNE



RĪGAS IZGLĪTĪBAS UN
INFORMATĪVI METODISKAIS
CENTRS



Kaunas Saule
Gymnasium



KAUNAS PANEMUNĖ
PRIMARY SCHOOL



KAUNAS ST. KAZIMIERAS
PROGYMNASIUM

Publication promoter
Kaunas teachers training centre

Ginta Tarankienė, project's "Effective International Partnership:
Success for Every Student" coordinator.
Renata Dudzinskienė, the manager of creation of tasks for a publication

Erasmus+ KA2 strategic partnership project's
"Effective International Partnership: Success for Every Student"
Training (learning) measure for educators, parents
Project number 2017-1-LT01-KA201-035254

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CONTENTS

Project “Effective International Partnership: Success for Every Student”174

Preface.....176

TEACHING METHODOLOGY FOR TEACHERS AND PARENTS

Tasks for 5–9 years old pupils.....179

Tasks for 10–14 years old pupils.....247

Tasks for 15–18 years old pupils.....303

Project “Effective International Partnership: Success for Every Student”

Kaunas Teacher Training Center has implemented an international project “**Effective International Partnership: Success for Every Student**” (agreement No. 2017-1-LT01-KA201-035254; “Effective International Partnership: Success for Every Student”), Key Action 2 - Strategic Partnership under Erasmus + program.

The aim of the project was to consolidate internationally existing experience to develop teaching and learning tools for both learners and educators. The project also aimed at designing methods and tools to foster advanced and critical thinking, develop the measures, which successfully apply a variety of gaming and IT methods and to establish the ways for successful implementation of the chosen learning program.

The coordinator: Kaunas Teacher Training Center.

The partners: Kaunas Kindergarten “Giliukas”, Kaunas Panemune Primary School, Kaunas St. Kazimieras Progymnasium, Kaunas Saule Gymnasium (Lithuania), Riga Education and Information Center (Latvia), Fitjar vidaregåande skule (Norway), “Kocaeli II Milli Egitim Mudurlugu” (Turkey).

The result of the project: new education tools designed:

- teaching / learning tools for pupils of all ages,
- teaching / learning methodology for educators: teachers and parents.

Reasons for the project

PISA data show that the educational outcomes of Lithuanian pupils do not satisfy the educational community and do not meet public expectations; furthermore, the country has a high number of low achievers and few high achievers.

Lithuanian, Latvian and Turkish pupils have lower scores than OECD average and a project of this type was necessary for the particular countries. Norway, although its pupils are above the OECD average, is interested in getting better, or at least staying stable, and therefore considered participation in the project expedient.

High quality of education and high student achievements are at the heart of the education strategy of all partner countries.

The current educational situation obliges teachers to set goals for themselves:

- find effective tools to help the learner achieve better learning outcomes;
- create a school that helps all pupils develop skills to excellence.

The partnership recognized that there were too few educational tools available to help develop advanced thinking through play, interactive activities, and integration of various learning subjects motivating students to learn and master knowledge.

What has been done within the project?

- *The change of educational culture discussed.* It involves properly selected teaching / learning tasks; a new learning strategy justifying approach; a set of thinking developing tools; systematic approach to developing pupils' thinking, taking into account the psychology of age groups.
- *The model of Thinking School implemented.* Students and teachers learn to think critically, adjust their skills in designing the curriculum; pupils and teachers achieve good teaching / learning outcomes by being able to act independently, interact and cooperate in educational activities and become more eager to learn.
- *Effective and modern intellectual products have been developed.*

Pupils completing the tasks designed within the project, will learn to collaborate, develop thinking skills, improve their listening competence and develop public speaking abilities through speaking tasks (speak persuasively, maintain unity of text and form, and avoid mistakes).

Teachers from Lithuania, Latvia, Turkey and Norway participating in the project have defined creative and critical thinking, provided educational opportunities and guidelines for self-improvement including professional mastery as ability to generate ideas, develop new teaching products, improve existing ones and motivate the student to learn.

Kaunas Teacher training Centre believes that participating in the project was beneficial to all parties, since the teachers tested and validated their professional competences, assessed and evaluated them, developed a learning product involving a set of tasks for students and guidelines for teachers and parents; have already conducted and will carry out dissemination of the project information and knowledge in the future.

A nice proof of the teachers' international communication and collaboration is this actual publication.

Kaunas Teacher Training Center wishes both those involved in the project and those who will use the product created by the project, every success and discovery in the pursuit of each student's progress.

*Rasa Bortkevičienė,
Director of Kaunas Teachers Training Center*

PREFACE

Developing critical and creative thinking for better student achievement and quality education

What does learning success mean for each student?

Learning success for each student is based on the notion that the student must achieve positive outcomes while learning in and outside the classroom.

Success in today's world depends on the ability to find, summarize and communicate information, to take action in solving complex problems and the ability to create learning products / deliver desired outcomes using modern technology and state-of-the-art methodologies.

The role of the teaching professional is significant in developing the 21st century students' learning skills and competencies.

It is important for the teacher to learn with the students and help them learn promoting their autonomy in looking for the best solution, new facts or analyzing information. It is useful to apply science and their own knowledge to new contexts or problematic situations. Therefore, developing critical and creative thinking and imagination is of paramount importance.

The teacher must constantly develop personal and professional competences for successful teaching and learning. Thus, during the project, teacher teams learned how to create assignments for students and write recommendations for teachers and parents.

Teams followed the principles of the Thinking School (<http://www.thinkingschoolsinternational.com>) whose aim is:

- To develop students' intelligence to work with information: analyze, visualize, systematize and draw conclusions; explain, classify, find laws, construct sequences, compare, interpret and etc.
- To develop intellectual capacity: evaluate facts, situations, and problems, generate ideas, imagine, predict what if (...), follow criteria, raise hypotheses, predict, idealize, etc.
- To teach students different methods: reflection, creativity and critical thinking.
- To teach students to learn.
- To improve thinking skills in the learning process.
- To organize a meaningful, self-directed learning process.
- To develop advanced thinking: use teacher and student experience, games and other learning methods.

The role of pupils and teacher's expectations.

The aim of the teachers preparing the set of tasks for students is to help students think creatively and critically, be able to find information on a given topic, analyze the information found, systematize it, draw logical conclusions or argue and quote various information sources.

The student is able to:

- *Analyze information sources;*

Independently, following the work plan designed by themselves or by the teacher, students search for answers to questions, examine the information found, answer questions, analyze facts and so on.

Students work independently, collect information, analyze, systematizes and conclude information, interview a variety of contacts: parents, professionals, museum staff, etc.

- *Organize information;*

Students are able to explain, visualize, compare, classify, interpret, analyze, draw conclusions, sequences and etc.

- *Ask themselves questions and use questions raised by the teacher;*

The students guide the learning process by asking questions to themselves and a friend, looking for an answer to the questions they and their friends have and seek for answers to the questions asked by the teacher.

- *Use thinking tools;*

The students are able to create and use mind maps, ask questions, think, research and solve problems. Pupils create and apply new models of mind maps and forms that help organize information and decisions. They even might find a specific, unique model of thinking and so on.

- *Apply the information;*

The students evaluate, generate, imagine, estimate, predict, guess what will happen if (...), apply rules, raise hypotheses, predict, idealize, etc.

- *Improve self-regulation skills;*

Students perceive proper behavior mode, set realistic goals and objectives; act purposefully, focus on purpose and activities, motivate themselves and friends, work independently and in a group, learn to communicate and cooperate; guide one's learning by planning steps and time; take responsibility for their actions and behavior; anticipate the consequences of their actions.

- *Reflecting;*

Reflection should help students to analyze and evaluate what was done in the task; what helped them achieve the goal? Why is the result so? What could be done better? What better not to do? What should be improved? Why is work good?

The purpose of reflection is to shape students' attitudes: motivation to improve the next time, avoid repeating mistakes, correct mistakes right away, think about their own learning and self-esteem, pursue further learning goals, and help develop skills that are less developed but required by the task.

It is the responsibility of the pupils to evaluate their own activities and to assess themselves: they use the results achieved in new situations and make the necessary corrections. This means taking the right steps and being aware of the development of one's own competences (self-regulation).

- *Create learning products / outcomes;*

Students prepare research models, interviews, various forms of presentation of learning outcomes; e.g. mind maps, cartoons, messages, stories, movies, debates, etc.

- *Public speaking;*

In compliance with the language rules students deliver learning outcomes and create learning products: storytelling, film, lecture, comic, poster, message, interview and etc.

- *Work in pairs and groups;*

Students identify and describe the methods used for this task and indicate why this method was chosen. Pupils work purposefully in pairs or groups and perform tasks.

The role of the teacher in the students' tasks.

The teacher is the coordinator of the educational process.

The teacher thinks about the task well. The tasks must be in line with the overall curriculum: content relevant and engaging, stimulating student thinking, and developing thinking and public speaking skills.

Thinking is visualized and / or talked about.

The teacher advises and helps the students by:

- Identifying appropriate learning resources, learning spaces, both traditional and non-traditional: museums, various institutions, parks, etc.

- Encouraging thinking in questions, teaching students to ask themselves and others questions, learning to answer questions logically, briefly and comprehensively, drawing conclusions, reasoning, quoting sources of information.
- Encouraging creative and critical thinking tasks, problem solving models, mind maps, etc.
- Providing guidance on how to achieve the best learning outcomes, find ideas and implement them.

Within the project, 58 tasks developing creative and critical thinking were designed.

In the preparation of the tasks, the relevance and integration of the topic were sought both topically and regarding the subject. Critical and creative thinking requires analysis, evaluation, validation of information and ideas, problem solving and decision making skills, thus the tasks created offer a variety of ways to learn:

- place-based learning,
- project-based learning,
- problem-based learning.

Teachers preparing tasks set themselves goals:

- To develop students' advanced thinking skills; teach effective thinking and behavioral strategies that help to locate, analyze and systematize information independently and to draw logical, reasoned conclusions. Operate at different levels of thinking, effectively achieve the goal of performing tasks well and achieving the best learning outcomes;
- To prepare students who know what to do when they do not know what to do;
- To develop life-long learning personalities;
- Communicate and collaborate with gifted, talented teachers in order to exchange information.

The tasks might be assigned to:

1. The whole class, group, or a student individually.
2. During the lesson. Teacher is a coordinator who guides and assists students.
3. Outside the class: consultations, clubs or field trips. In formal and informal spaces: working independently, in pairs or in a group, at school, at home, with the assistance of a teacher, parents or others.

While designing the tasks, the teachers sought education that fosters a desire to learn and master knowledge. The authors pursue education that is closely related to life when teachers guide the learning process, give questions, show steps leading to the right answer and help a student who experiences some difficulties.

In this publication the project partners provide tasks stimulating students' creative and critical thinking.

*Renata Dudzinskienė,
The Manager of Tasks Creation for a Publication*

TEACHING METHODOLOGY FOR TEACHERS AND PARENTS

Tasks for 5–9 years old pupils

Topic: WATER AND COLOR

Target audience: Preschool children (5–6 years old)

Aims: to find water and colors interaction.

How will the activity develop children'?

- cooperation and individual performance (children will develop skills of communication in artistic activities; children negotiate, make experiments acting individual and together);
- thinking (children will develop observation skill, creativity, thinking (children will conceive that color's intensity is related to the amount of water), children will gain new knowledge and experience;
- behavior (children will have to wait patiently for their turn, be friendly, keep attention while listening);
- cognition (children will count, measure, compare);
- motoric (children natural curiosity will be stimulated while developing sensorics and minor motoric (using pipettes and other means).

Teacher's expectations towards students (or the roles of students' involvement)

Children will be able to work alone or together, listen to one other thoughts, be active, will not repeat their friends statements. Every child will make conclusions, will be able to rise questions for himself/herself.

- E.g. Why are colors needed?
- Can we survive without colours?
- What will happen on Earth if there were no colours and water? Etc.

The role of the teacher in the task and presentation: while pupils are solving tasks

During the conversation with children (Morning circle), the teacher gives tasks and asks questions (based on Bloom taxonomy).

Knowledge

What colors do children know?

E.g. What are colors? What colors are called "warm", and what "cold"?

Comprehending

Do colors change water, or water colors?

An experiment is carried out.

- Two colors are chosen using paints intended for food, and solution for experiments is prepared in two glasses. The glasses are filled half with water.
- The solution of one color (e. g yellow) is taken away, and the experiment is carried out using another solution (e.g. blue):
 - we use 10 small glass beakers (or other vessels of small capacity) with water and using pipette the prepared solution is dripped in this way: 1 drop in first beaker, 2 drops into the second, etc. Children compare the change of color in water (how blue color tint in water);
 - after this, children try to drip water into the beakers and observe if there are any changes;
 - 10 petri plates are taken and the colored water is dripped into them (blue in our experiment) till water covers the bottom of the plate. Then children put the plates with water on the light table and examine how the colored water changes in this way;

- later we use the second glass with another prepared color (yellow in our experiment) we put away for some time. It is filled with water, there should be more than half of liquid. The glass is put in front or behind the beakers with blue color paints. Children try to find the change of color through glass. Also, the beaker with blue color is put into the glass with water of yellow color and children observe if there are changes of colors.

NOTE. The glass with yellow water is put in front the beakers with blue water beginning from the one with only one drop of blue paint we have put in water, then two drops and etc. Or we can decide with children to take only the first with one drop and the one with 10 drops.

Applying

Paint can be get out while using natural materials.

Children can work alone or in groups. It is suggested to get out colors from natural materials (e.g. juice of beetroot, red cabbage, spinach, tea verges. Children paint using the colors they have got.

Analyzing

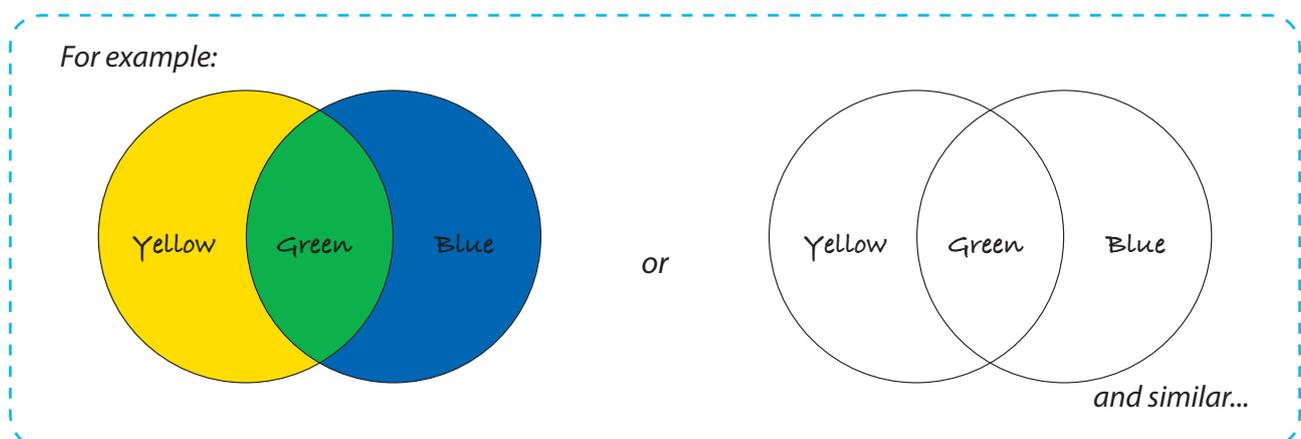
Can we clean the colored water?

The colored water can be filtrated using sand or plants. Children can observe if colored water can be cleaned through sand, how the color change, etc. Children figure out what concepts “colorless”, “transparent”, etc. mean. For example, they compare what is “white” and “transparent”, distinguish between “white is colorless” or “transparent is colorless”, etc.

Synthesizing

How and what colors can be get out while mixing them?

Children have got three main colors. They mix them and get out other colors they know. They depict them in Venno diagram.



Evaluating

What would happen if the world were colorless?

Children formulate their answers according their experience from further activities levels. An activity for children can be suggested: to divide the list of paper into to parts and draw on one part black and white and color everything on the other part. Then, every child can compare and evaluate the two drawings. The teacher can ask such questions:

- Is it more fun to live in colored world, why?
- What need do colorless things bring?

Creating of educational environment. How it will be prepared?

- Illustrations, diagrams of colors changing are presented to children
- Cartoon "Colors" is being watched
- ICT interactive game "Find which color?" "Lotto of colors", etc.
- Creating of Mind Map from children drawings.

Evaluation (criteria showing that teachers and students achieved the successful results).

- students active participation, involvement into suggested activities;
- students positive emotions;
- students answers to questions, students' questions while solving the tasks, completion of tasks.

Self-assessment criteria. Criteria of teaching results evaluation.

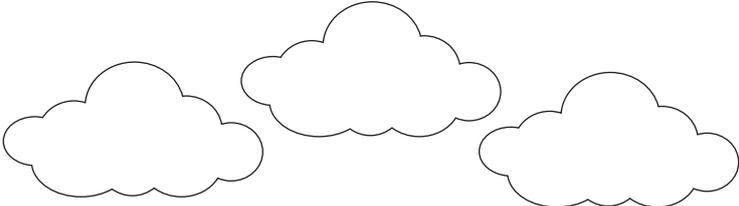
Game-reflection 3...2...1 "Clouds of thoughts".

Students are given activities evaluation sheets where they draw or write down:

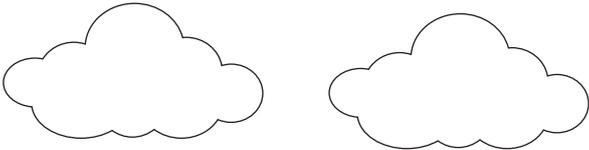
- 3 clouds – 3 new things I have learned.
- 2 clouds – 2 things I've already knew.
- 1 cloud – 1 more questions I still would like to ask.

Student's name

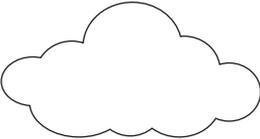
3. 3 new things I have learned.



2. 2 things I've already knew.



1. 1 more questions I still would like to ask.



- Conversation with children where do they apply what they have known. Why it is useful for them?
- The comparisons children have made according (e.g. Venn diagram) criteria. Naming of advantages and disadvantages, making conclusions.

*Author: Daiva Bobinaitė
Kaunas kindergarten "Giliukas"*

Topic: THE STATES OF WATER

Target audience: preschool children (5–6 years old).

Aims: to find three different states of water (solid, liquid, gas), analyze, make conclusions, insights.

How will the activity develop children?

- interest in exploring (children experiment, perform the tests, suggest ideas, try to implement them, tell their doubts, make conclusions);
- cooperation and individual performance (children negotiate, combine their desires with others, will work individually and together);
- thinking (develop logical and critical thinking, gain new knowledge, experience);
- spoken speech development (children tell their experience, debate naming various details, characteristics, states, use the new words they have heard);
- creativity through experience (children alone or together with others look for answers, unexpected ideas, individual solutions, performance techniques, implement artistic – creative ideas);
- cognition (observe, analyze, compare, fix their insights).

Teacher's expectations (The role of the learners)

Children will be able to work together and individually, listen attentively to their friends' thoughts without interrupting them, do not repeat the same ideas, participate actively. Every child will choose the group he/she is going to work together and will make experiments with friends. He/she will look for information individually or with adult help, make conclusions, raise questions, and will look for answers.

The role of the teacher in the task and presentation

The teacher presents the tasks and questions (based on Bloom taxonomy)

Knowledge

What states of water do you know? or What water can be?

Children name what states of water they know, saw, and came across. Watching the film

<https://www.youtube.com/watch?v=2+NOPxvH7dc>.

Smart robots. Ice, water, gas.

Brainstorming, discussion.

Comprehending

What do we need if we want to change the states of water?

At first, we try to find out what understanding children have got. Children name what they know already. Also, children try to answer to problem question: how to change water into ice.

Applying

Think and create a mosaic, creative art work from natural materials, beads, glasses, etc. Pour water on it and freeze. Children can work in pairs or in groups.

Analyzing

Practical task:

The vessel is filled with water and put into the fridge to freeze. What are the reasons for water to change? Can water have some kind of form? Children poured water into vessels of different forms, and when water froze, children can find that the form of frozen water is the same as a form of vessel they poured water in.

How do gas form? How can we notice it?

Key task together with parents

to boil water (an adult demonstrates, children sit in safe distance and watch: the task is too dangerous for children, even with an adult help).

Fill the kettle with water and measure the temperature of water. When the water begins to boil, evaporation is in process (steam appears), and the amount of water decreases.

The task for parents

together with children write the temperature of water. Write the verbs children say while watching the states of water change. Prepare the text, cut it into pieces- A, B, C. Also, you can add photos of experiment. Put the text or pictures, photos in right order.

Children find out how the state of water changes with the change of temperature.

AN EXPERIMENT with water and a candle. Why does the water rise?

Children fill in the task lists individually, make conclusions. Make self-evaluation.

Synthesizing

Create a story, tale about water.

Related themes, subjects

- learning to learn;
- counting;
- environmental knowledge;
- artistic activities (minor motoric).

Description

- Find the features of water using senses: taste, sight, and smell. What are the characteristic features of water (colorless, odorless, and tasteless)? The game "Guess what is it?".
- The task at home together with parents: frozen water in one-time plates, using various natural materials, glasses, beads or other to make mosaic.
- Watch with children how the states of water change: ice becomes liquid in room temperature.
- Make experiment with boiling water.
- Create a story, tale about water.

Methods:

- experiment;
- conversation;
- narration;
- game "Guess what is it?".

Teaching means:

- interactive board;
- encyclopedias, books;
- artistic means;
- natural materials.

Questions developing critical thinking:

- What do we need to change water into ice?
- What states of water do you know?
- How can we see steam?
- How does steam appear?
- In what temperature does water begins to boil?
- On what different states of water do depend?
- Why did ice melt?
- Why do some things stay on the top and other in the bottom in frozen ice?
- What will happen if we boil water for the long time?
- Will the color of frozen water change?
- Why cannot salt water be frozen?

Evaluating

- Why water is useful and where can we use it?
- Why water is needed in nature, human life? (Additional questions from teacher may ne needed to help children to formulate their thoughts).

Creating of educational environment. How it will be prepared?

- Watching of the cartoon „Smart robots“.
- Ice, water, stream
- Means that help to carry on the experiments

Evaluation (criteria showing that teachers and students achieved the successful results).

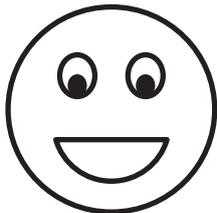
- students active involvement into suggested activities.
- students' positive emotions;
- students answers to questions, raising questions while solving the tasks, completion of tasks.

Self-assessment criteria. Criteria of teaching results evaluation.

- Conversation with children what new things have they known, why is it useful for them.

Smiles

Criteria for self evaluation of the activity

		
Broad smile – I fulfilled the task myself and could help others	Restrained smile – I fulfilled the task with the help of friends, parents, teacher	A face without smile – The activity was difficult, not interesting

Suggestions for further independent studying:

- make an experiment with salt solution, observe if the water freezes up.
- look for answers why if we freeze the things of different weight in water, some of them stay on the top and other lay on the bottom.
- grow salt crystal.
- a task with parents together with children „Why does water rise?“

*Author: Aušra Šlemo
Kaunas kindergarten "Giliukas"*

Topic: MACHINES AND CARS

Target audience: preschoolers (5–6 years old).

Aims: the learners will find out why for and how many different kinds of machines are created? Analyze the types of autocars, the purpose they are created for, will find out the advantages and disadvantages of autocars and will make their own evaluations and insights.

How will the activity develop students?

- Cooperation and individual performance (students will develop skills of communication in creative activities, they negotiate, will work individually and together);
- Thinking (students will develop observation skills, encourage the creative and critical thinking while analyzing the types of autocars, the advantages and disadvantages; will understand the variety of machines types as well as the variety of machines purposes; students will gain new experience and knowledge);
- Behavior (students will be encouraged to ask questions about machines and autocars, will be guided by the questions of a teacher as well; compare the differences or combabilities using a Venn diagram; will make and compare the conclusions and insights they have done and will be active participants in a process sharing them);
- Cognition (students observe, will learn how to analyze, to cope the knowledge)

Teacher's expectations (or the roles of students' involvement)

Students will be able to work together and individually, will be an active listeners and participants in the process, and will be encouraged to share their personal thoughts, trying not only to repeat the thoughts or shared insights of a friend, who spoke before him or her, as this is typical way of preschoolers :)). Every student will choose the cars he or she likes the most and will compare, will create the questions as for example:

- *Is it possible to fly to the Moon with a machine (autocar)?*
- *Why we can't wash dishes with a washing machine?*
- *Why a sewing machine is created if we can sew just with a needle? and etc.*

The role of the teacher in the task and presentation

At first, a teacher tries to involve students into conversation. At pres-school, it's usually „Morning Circle talk” strategy is used. The teacher presents the tasks and questions using Bloom's taxonomy steps:

Knowledge

What type of machines have you got at home?

Students share their knowledge on this level. You can expect such replies from preschoolers: *my Mom's or Dad's machine, sewing machine, washing machine and etc.*

The teacher involves students to participate actively by giving such simple questions as for example:

- *What is a machine?*
- *Tell me at least 3 machines you know?*
- *Are there machines without wheels? Etc.*

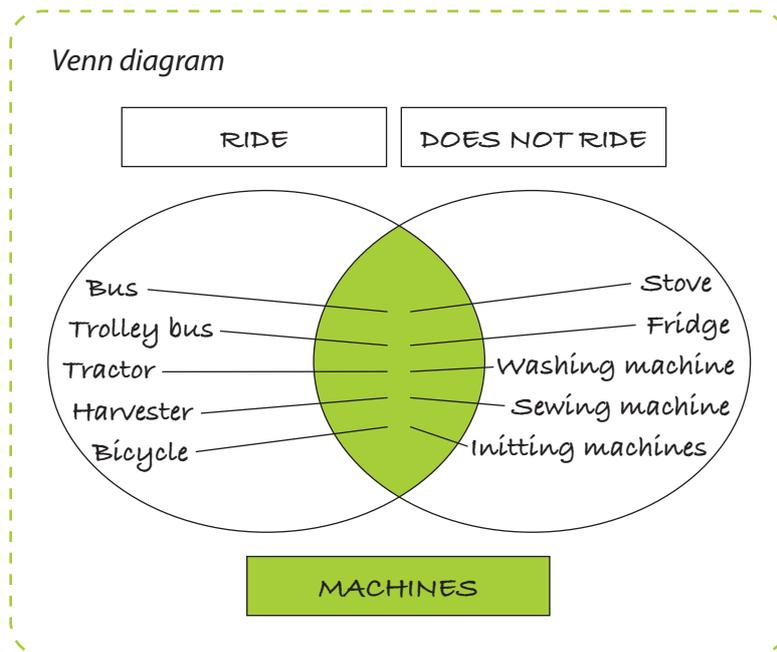
Comprehending

If a TV (refrigerator, microwave) is a machine?

The main purpose now, it is to make students understand what we describe by using a word "MACHINE" (Note: usually "a machine" for a preschoolers is an automobile their parents take them on a ride, to a school and etc.). Sure, they have heard that a word "machine" is used to name a 'washing machine', 'sewing machine' and etc. And then again, they can start to name even such things as, microwave, refrigerator and etc. So, at first, it might sound confusing for them. For this reason, the teacher's purpose in this level, is to help for students to understand the difference among all these mentioned things they have named, by giving such questions as for example:

- What machines are doing? (Most expected reply: rides)
- Explain, why a refrigerator isn't a machine?
- Can you ride using a sewing machine? It's a machine, isn't it?
- Can you explain, what is a machine in your own words?

NOTE. Pre-schoolers make comparisons among the things they might explain as a "machine" to a Venn diagram. And at the end they will come to a conclusion, that not all things they do know and call as a "machine" are able to ride, but most of them have got one thing in common - a wheel. Has a sewing machine got a wheel, hasn't it? A washing machine usually turns the laundry in a wheel, doesn't it? As most machines operate, you can see a movement. In a case, a TV set hasn't got a wheel, so... (Hope you get the clue).



Applying

Use a recycling material to create your imaginary machine (note: this time "machine" in the meaning of autocar).

(Here's all the space is used for students' creativity).

Analyzing

What's wrong with your machine? What do you need if you want to ride it in real?

Students analyze what they need for the car to be able to ride. Here come such questions as a hint, to make every student think deeper and to learn whilst analyzing. For example:

- *What's needed for TV set (refrigerator, sewing machine, or a washing machine) to function? (Mostly expected reply: electricity...and for a machine (as autocar) - gas or petrol).*
- *What are the differences between a tractor and a trolleybus?*
- *Compare a bus and a trolleybus?*

Synthesizing

What kind of machine would you like to invent? Create an imaginary story about your parent trip with this imaginary car.

Students have to create what kind of car it will be and explain why and how parent use such an invention.

Evaluating

If your machine (autocar) was real, what advantages and disadvantages it would have?

Possible questions:

- *If a machine (autocar) charged by electricity is better than the one which needs a petrol?*
- *If it's possible to ride a machine (autocar) without pedals?*
- *What can be changed to increase safety of a machine?*

* * *

Suggested activities for pre-school children (3–4 years old)

Knowledge

Find the machines you can see in the group.

Comprehending

Is a chair a car? Can the table go? Why?

Applying

Make a car using Lego Duplo bricks. (Children can work individually or in groups)

Analyzing

Why your car can go?

Teacher (or other adult) shows pictures and asks children questions. E.g. what are the similarities between a car and a tricycle?

Name the parts of a machine. (The machine children made is taken to pieces, discussing about different parts – how they are named and why they are needed, e.g. a seat, a steering wheel, wheels, brakes, etc. The task is to get answers from children.

Show the differences between a car and a motorcycle?

Synthesizing

Create a funny machine or a story about the machine adventures in the city.

Children answers or activities can be different.

Evaluating

What can you bring in your car and what things will not fit in it?

Any children' answer or explanation is acceptable.

Methods and tools of creative and critical thinking

Conversation, games, brainstorming, comparing and analyzing (Venn diagram).

Creating of educational environment. How it will be prepared?

- illustrations, posters, picture -cards for visualizations of machines are given;
- animated movie "Cars" is suggested;
- table games are played "Find what's missing", "Where it matches"
- excursion to Lithuanian Roads museum in Vievis;
- interactive games on a IQ whiteboard;
- creating Mind Maps about cars using children drawings, clippings from old magazines, newspapers and etc.

Evaluation (criteria showing that teachers and students achieved the successful results).

- students active participation, involvement into suggested activities.
- students positive emotions;
- students answers to questions, students' questions while solving the tasks, completion of tasks.

Self-assessment criteria. Criteria of teaching results evaluation.

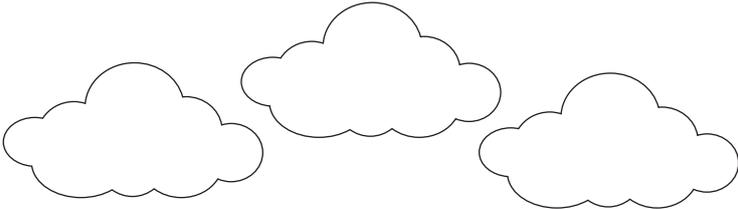
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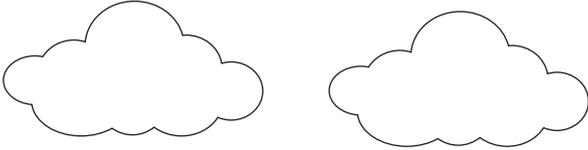
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Student's name

3. 3 new things I have learned.



2. 2 things I've already knew.



1. 1 more questions I still would like to ask.



- Conversation with students, how they are going to use what they have learned? Why is it useful for them?
- Comparisons students made according Venn diagram criteria: naming advantages and disadvantages, making conclusions.

Topic: MY PET (A DOG)

The theme is suggested by children themselves when one child took a little dog from a shelter. The child has got so many impressions that we all decided that he has to tell everything about his pet to his friends.

Target audience: preschool children (5–6 years old).

Aims: Children will get acquainted with different species of dogs, will clear out what species the pet is. Children will make their insights, conclusions.

How will the creative cognitive activity develop the learners?

- cooperation and individual performance (children listen to other opinions, learn one from another, take part in discussions, conversations, cooperate benevolently);
- thinking (develop curiosity, tell their point of view, reason in what they succeeded, find information by themselves, think what they still do not know and what they like to know, gain new knowledge);
- creativity through experience (children look for information, suggest ideas and they to implement them);
- spoken speech development (children tell about their pets, ask questions, gather information);
- cognition (children observe, analyze, make their insights about dogs' species).

Teacher's expectations (or the roles of students' involvement)

Children will be able to gather information by themselves or with friends (parents) help. They will be ready to present their pet, ask questions, take part in discussions, debate.

The role of the teacher in the task and presentation

A teacher gives tasks and asks questions (according Bloom's taxonomy)

Knowledge

What species of dogs do you keep at home?

Children talk what they know about their pets. Predictable answers: e.g. not all children know what species their dog is.

Comprehending

Why do people keep dogs? How did your pet appear in your home?

Applying

Encourage children to prepare presentations about their pets, what new knowledge has he/she gained. The teacher prepares pet's presentation map for children (children sticks all gathered material into corresponding place).

Children are asked such questions:

What would happen if there were no dogs at all?

- Why people are the best dogs' friends?
- What do we need to know if we keep dogs? (watching film "Save behavior with animals") www.civilinèsauga.lt
- How to communicate with animals safely? (7 lessons prepared by Lithuanian Cynologists' association, "Domestic animals and plants" www.ismaniejrobotai.lt).
- Children are suggested to play a game during which they have to extend the story according given situations.

Analyzing

How did the different species of dogs appear?

After children fill the pet's map they visit dogs' shelter and get knowledge how dogs live there.

What is the difference of dogs live in dogs' shelter and your home? Possible questions: why do dogs live in dogs' shelter?

Compare if all dogs behavior is the same. Etc.

Synthesizing

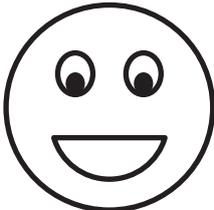
If a dog can talk, what will it ask? Children create a story (stories can differ).

Evaluating

- Why it is better for a dog to live at home than in a dog shelter?
- What do you have to know if you have got a dog?
- How do you behave with your dog?
- What benefits do you get if you have got a dog?

Creating of educational environment. How it will be prepared?

Criteria for self evaluation of the activity

<i>Smiles</i>			
	<p><i>Broad smile – I fulfilled the task myself and could help others</i></p>	<p><i>Restrained smile – I fulfilled the task with the help of friends, parents, teacher</i></p>	<p><i>A face without smile – The activity was difficult, not interesting</i></p>

Evaluation (criteria showing that teachers and students achieved the successful results).

- students' active involvement into suggested activities;
- students' positive emotions;
- students' answers to the questions, raising questions while solving the tasks, completion of tasks.

Description:

- get acquaintance with various dogs' species (slide watching, films);
- children presentations (children present a story about their pet, if they haven't got it, they gather information about dogs shelters that are in Kaunas);
- creating a story "If my dog could talk what would it say...";
- interview, presentation about dogs that live in dog shelter;
- draw your pet, if you haven't got one, then "A dog I would like to have..."

Methods:

- Observation
- Discussion
- Conversation
- Story telling
- Game.

Questions developing critical thinking:

- What would happen if there were no dogs at all?
- How did dogs' species appear?
- Why do people keep dogs?
- How did your dog appear in your home?
- If a dog could speak, what it would ask?
- Why people are the best dogs' friends?

Suggestions for further independent studying:

Illustrate drawings and photos children have brought making a book "My pet".
Visit dog shelter.

*Author: Aušra Šlemo
Kaunas kindergarten "Giliukas"*

Topic: I SORT, MEANS, I THINK (PAPER)

Target audience: preschool children (5–6 years old)

Aims: to find out and discover how to use paper as second raw material

How will creative and/or critical activity develop the learners?

- thinking (children will be able to conceive and evaluate the main ecological and environmental protection problems).
- consciousness (children will learn main principles of consumer culture).
- cognition (children will deepen their knowledge about rubbish sorting (will be able to separate second raw materials and waste, observe, compare, analyze, fix their insights).
- creativity (children will be able to use the knowledge they have got and apply them in practical situations, will gain value attitudes).
- spoken speech development (children tell their experience, debate naming various details, characteristics, states);
- cooperation and individual performance (children will improve their skills of cooperation in creative activities; they negotiate, experiment together and individually).
- behavior (children will be able to wait for their turn friendly and patiently, will concentrate attention while listening).

Teacher's expectations (the role of the learners)

Children will be able to work individually and together, listen to their friends, will learn one from another, will try not to repeat the ideas told by the friends, tell their thoughts bravely. Children will work in small groups, compare their insights, make conclusions, will be able to raise questions for themselves.

What is the role of the teacher in the task and presentation?

During the conversation with children (The Morning Circle), the teacher presents tasks and questions (based on Bloom taxonomy).

Knowledge

What has happened in the world when paper was invented?

At the beginning of the activity, children chose one of their works they like best from their work folders. During the discussion with children they talk about what they have drawn. The "magical" box is opened to children where they can find various things from paper (e.g. books, magazines, paper present bags, etc.) Children are asked to find links between their drawings and things in the box (children are given hints to answer that this link is paper). The Mind Map is created (e.g. according to Bubble map principle the ideas are fixed in the middle of circle or visualized on the page).

Comprehending

Why do people need paper?

Children are suggested to watch a short film, which provides various facts from history: when people didn't know paper, they draw and write on cliffs, stones, later on clay or wax tables, animal skin, silk, papyrus, etc. And when paper was invented in early times it was very expensive and only rich people can buy it.

Applying

Is it possible to recycle paper?

It is suggested for children to establish paper recycling workshop in the group. Children with parents (or other adult) help gather waste paper all the week (e.g. old newspapers, magazines, paper boxes, etc.). Later they sort them according to the thickness, colors of paper (e.g. cardboard, newspaper, drawing paper, etc.). Preparations are done to produce paper mass.

What we need to make paper mass:

Sorted paper (according to texture, color) is torn into small pieces, the water is poured on it and the mass is kept for some days. Then the mass is whipped up with a mixer, and wood glue is added (3 big spoons of glue into 0,5 l of mass). Then we take the prepared mass and using special frame with a net or spoon or simply by hands form a list of paper (the form we like: circle, square, rectangle or other form) on the piece of fabric. Then we can put on another piece of fabric and smooth our list with a mangle.

The paper mass is often drained with sponge through the fabric from both sides, turning it over. When the list gains its form, it is put on the clean fabric and left to dry naturally or in the oven. Or it is possible to iron it covered with newspaper or fabric.

Later children thoughts – suggestion map is created, writing in it what can we do from the paper mass.

- Children can use prepared paper mass to make paper, various cards, invitations, toys, frames.
- Recycled paper can be decorated using dried plants: flowers, herbs (the plants should be put into paper mass before it dries).
- If we prepare paper mass from colored magazines, it is possible to form colored ornaments, patterns, etc.
- Make mosaics while cutting or tearing old magazines or newspapers.

Analyzing

What need do we gain if paper is recycled?

The Mind Map is created (Cause Effect Multi flow map).

Synthesizing

Create a story what will happen if there were no trees on Earth (they all would be cut off).

Children create a story in the groups of four. Every group gets a big list of paper and create the story drawing.

Evaluating

Does the paper recycling help to protect nature? How and why?

Possible questions stimulating critical thinking:

- If there were no paper on Earth, would we have books or magazines?
- If there were no paper on Earth, maybe we would have less rubbish?
- What do people need more: paper or trees?
- What other things can change paper (now and in ancient times)?

Creating of educational environment. How it will be prepared?

- Watching film "The appearance of paper";
- The boxes for waste paper collection;
- Creating of Mind Map.

Evaluation (criteria showing that teachers and students are satisfied with the achieved results).

- students active participation, involvement into suggested activities.
- positive emotions of students;
- students' answers to questions, students' questions while solving the tasks, completion of tasks.

Self-assessment criteria. Criteria of teaching results evaluation.

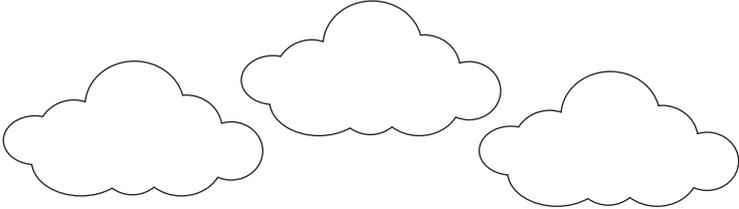
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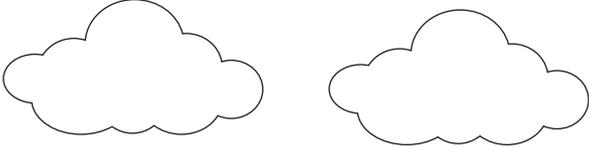
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Student's name

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- Conversation with children where can they apply the things they have known? Why is it useful for them?
- Comparisons children made according specified criteria (e.g. created Mind Maps). Naming advantages and disadvantages, conclusion making.

*Author: Daiva Bobinaitė
Kaunas kindergarten „Giliukas“*

Topic: FIRST FLOWERS OF SPRING

Target audience: preschool children (5–6 years old).

Aims: to analyze the similarities of flowers.

How will the activity develop the learners?

- cooperation and individual performance (children will get skills of cooperation working together, they negotiate, work alone and together);
- cognition (children observe, analyze, compare, fix their insights);
- thinking (children will develop their curiosity, creativity, observation skills, systematize information, will gain new experience, knowledge);
- creativity through experience (children will ask questions, try to find out new solutions, ways to act raising questions,);
- spoken speech development (children will describe the plants, make plans, express their thoughts).

Teacher's expectations (the role of the learners)

Every child will choose the flowers he/she likes, analyze it, compare, and make conclusions.

What is the teacher's role at the time children are fulfilling tasks?

The teacher presents the tasks and questions (based on Bloom taxonomy).

Knowledge

What are the similarities and differences between first spring flowers (dandelion and anemone)

Children tell what they know about these flowers. They divide into groups according to what flower they will explore. Additional questions of the teacher help to widen children knowledge, e.g. how does the blossom of the flowers look like? (Color, form, similar to what). What kind of leaves, roots has it got?

Comprehending

Before observation, children make plan of an excursion in kindergarten's territory, draw a scheme. If they couldn't find the plants in kindergarten's territory, the excursion into meadows will be planned.

Critical questions are presented for children in order to deepen their knowledge:

- Why do these flowers grow without any care of people?
- What do we need if we want the flowers to grow?
- What flowers are meadow flowers?
- Why are they the first flowers?
- What are they needed for?

Applying

Children works in pairs or in groups.

Analyzing

The teacher asks questions while showing pictures, illustrations:

- How the flowers do appear in meadows?
- Why are they needed and useful?
- Are there other first flowers in the world?
- How can we find them?

Synthesizing

- Make conclusions: do these flowers have more similarities or differences? Why?
- Create a story, tale about flowers.
- Draw a house decorated in flowers.

Related themes, subjects

- Ability to look for, observe and find details, systemize.
- Environment knowledge.
- Artistic activities.

Description

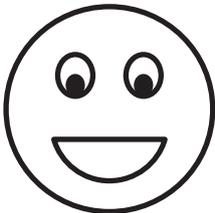
- Analysis of the first meadow flowers: dandelion, anemone, the parts of plants.
- Planning of the trip, analysis of route.
- Excursion to meadows, plant finding, observation, analysis, comparing.
- Practical tasks: to create a puzzle, write (plant's parts).

Questions developing critical thinking:

- What is a meadow flower?
- What will happen if there were no flowers in meadows?
- Why do need flowers for?
- In what way do flowers appear in meadows?
- What do flowers need in order to grow?
- Where should we look for these first flowers?
- Where do they grow near our flower garden?

Self-assessment criteria of the activity

Criteria for self evaluation of the activity

<i>Smiles</i>			
	Broad smile – I fulfilled the task myself and could help others	Restrained smile – I fulfilled the task with the help of friends, parents, teacher	A face without smile – The activity was difficult, not interesting

Suggestions for further independent studying:

- Brainstorming (to evaluate the knowledge children have got about plants).
- Draw a scheme of the trip in/or outside kindergarten's territory (using the kindergarten's plan).
- Draw, color dandelion, anemone.
- Fill in the names of plants parts.
- Put a puzzle.
- Conversations with parents, grandparents: why do we need plants, the use of them?

*Author: Aušra Šlemo
Kaunas kindergarten „Giliukas“*

Topic: WHAT CONDITIONS ARE NECESSARY FOR PLANTS TO GROW?

Target audience: preschool children (5–7 years old).

Aims: to find the conditions that are necessary for plants to grow.

How will the activity develop the learners?

- cooperation and individual performance (children will develop cooperation in creative activities, negotiate, will experiment in pair and individually);
- thinking (children will develop critical thinking, observation skill, will gain new knowledge and experience);
- behavior (children will have to wait patiently for their turn, be friendly, keep attention while listening);
- cognition (children observe, compare, analyze fix their remarks).

Related topics and subjects:

- exploring and gathering information;
- learning to learn;
- language development;
- environmental knowledge;
- artistic skills development.

Methods: conversation, observation, experiment, brainstorming.

Description

At the beginning of the activity, during the conversation with children we find out what children know about onion (e.g. that onions can be white and red, is onion a fruit or vegetable? ect.)

Equipment needed for the activity

Transparent plastic bowls, materials: sand or gravel, turf, moss, tree bark, clay, water, box of carton or other non-transparent material, magnifying glasses, encyclopedias of gardening, interactive board, etc.

- The transparent plastic bowls are prepared for the first observation:
 - with turf;
 - with clay;
 - with sand or gravel;
 - with tree bark and moss;
 - with water.

The onions are planted/ merged in all these bowls. The bowls are left on the window sill for two weeks. Children water the plants according to the need and observe how onions grow and change.

In the middle of the next week children are suggested to do another kind of observation. The conditions of onions growing are changed deciding with children how:

- For example, in this observation is suggested:
 - to cover the bowl with turf with carton (or other impenetrable material) box;
 - to not water the onion growing in the bowl with clay;
 - to take the onion that grows in the bowl with tree bark and moss from window sill and put somewhere further from sunshine.
 - the onion that grows in sand or gravel bring in the yard.

Children observe changes for a week. All onions are watered, except one (that grows in the bowl with clay or another according to agreement with children). At the end of the week all bowls with onions are brought again on the window sill.

Children make „Mind Maps“to mark changes of onions (*Look at the example*).

The example of a “Mind Map”



Explanation

Five patterns of baskets (or other forms) are prepared (according as for 5 bowls, and 10 patterns of onions – two for one basket). Then the agreements with children are made how we are going to mark the baskets: e.g. we can write words as Turf, water, Sand, Tree bar, Clay; if children do not write or read, we can stick a little amount of the material in what the onion grows to the basket using insulating tape. Or children invented symbols can be also drawn. The basket is divided into two parts – to mark the first and the second observation.

While making first and second observation, children according to their notice draw, cut, stick onions springs and roots using patterns.

Environment

Environment of group and yard.

- Questions stimulating critical thinking:
 - Why did the onion grow up?
 - Why did not the onion grow up?
 - Which onion did grow up quicker? Why?
 - What happened when the onion was not watered?
 - Did the onion grow when it was covered with a box?
 - What happened when the onion was covered with a box?
 - Why did onions’springs become yellow and begin to dry?
 - Can the onion grow in clay?
 - How did the onion grow after it was brought to the yard?
 - What are the ways I can use this experience?

Criteria to evaluate the activities

Conversation with what they have known before, what new things they discovered, what was a kind of surprise for the, what things they liked the best, what they didn't like at all, why, what they understood and what was not clear.

After the conversation children do self-evaluation using the principle of „traffic lights“. Red color – it was hard, I didn't understand many things, green – I understood everything, I succeeded, yellow- I did not understand everything, I need some help to make some things clear. Evaluation is anonymous. The results of evaluation are discussed individually.

Suggestions for further independent studying:

Children make sandwiches with the onions they have grown, taste them and compare if the taste is different when onions grew in different conditions.

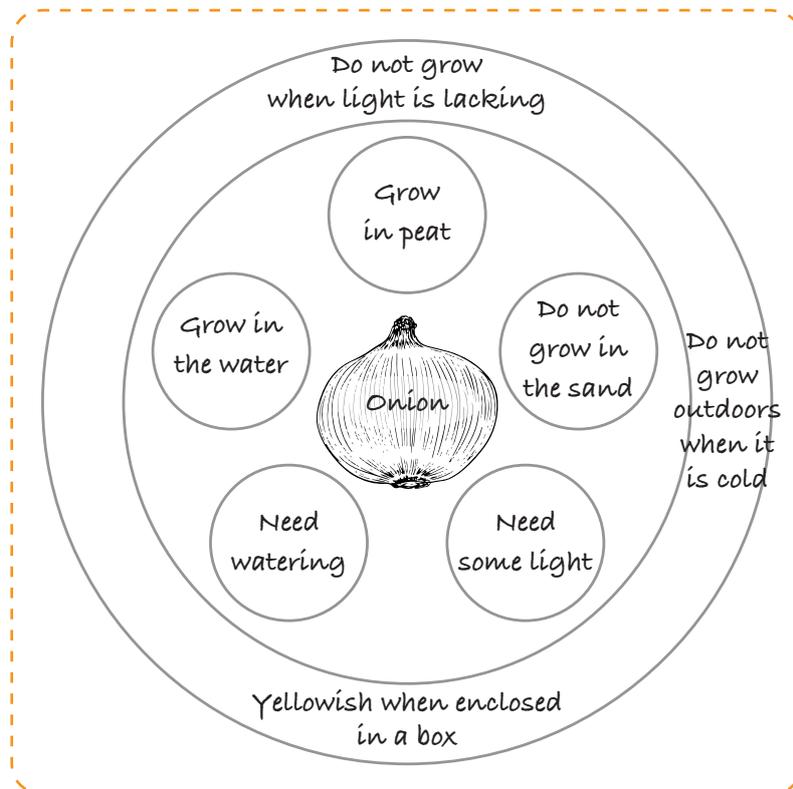
It can be suggested for children to grow another kind of vegetable or salads. Or grow up celery from the celery root.

Children can grow up and observe spring flowers that grow from bulbs, e.g. hyacinths, tulips, daffodils, saffron). Children choose bulbs and grow them up (in group or at home) and try to guess what flower will grow up and how it blossoms, then look for information about it.

Analysis

Compare the conditions under which onions grew better?

Children can depict it on the "Circle Map".



Synthesis

Imagine being a farmer and growing the biggest onion. Tell your story.

Children create stories and illustrate them with drawings.

Evaluation/Reflection

What plants are grown from bulbs? Will they be treated equally?

It is suggested to grow and observe spring bulbous flowers, such as daffodils, hyacinths, tulips or crocuses.

Children pick a flower bulb and grow it in a group or at home. They try to predict the process, looking for information on what the flower is.

Creation of educational environment. How will the educational environment be prepared?

- various plant illustrations, cards;
- „Chipoline“ cartoon;
- interactive FREPPY game "Shop";
- Mind map.

Evaluation/reflection

What are the evidence that students and teachers are satisfied with the results?

- Active engagement into the activity.
- Positive emotions.
- Answering questions, asking yourself questions, completing activities, completing tasks.

Self-assessment criteria. Criteria of teaching results evaluation.

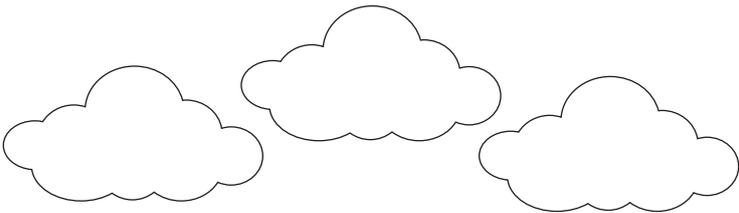
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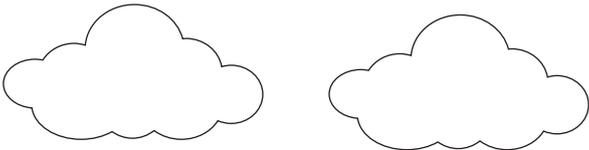
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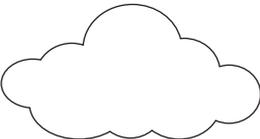
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- Conversation with children, where will they apply what they have learned? Why is it useful to them?
- Children compare their findings using a circle map or observation path criteria. Discussing the benefits, defining shortcomings and drawing conclusions.

Topic: “ME AND CLEAN NATURE”

Target audience: preschool children (5–7 years old)

Aim: to find out why we need to sort garbage, form habits of responsible behavior, analyze, make decisions, insights.

How the activity will develop?

- spoken speech development (children tell their experience, debate naming various details, characteristics, states);
- creativity through experience (children look for unknown information, experiment in the ways they choose, propose different ideas and implement them);
- cooperation and individual performance (children listen to other opinion, learn from others, cooperate benevolently);
- thinking (children tell their point of view, reason how they succeed to perform, look for information themselves, think over what they have learned and what they want to learn in the future);
- cognition (children observe, analyze, fix their insights, will be motivated to raise questions).

Teacher’s expectations (the role of the learners)

The teacher presents the tasks and questions (based on Bloom taxonomy).

Knowledge

Discussion “How to sort household waste?” Brainstorm “Why do we need to sort garbage?”

Children talk how they sort garbage at home. Children get acquainted with the word “ecology”.

Ecology in Greek language (οίκος – house, dwelling + λόγος – science, word) is a science that investigate the relationships between living organisms with the environment they are surrounded, including such physical factors as climate, geographical conditions, interaction between living and artificial nature. More simply, “this house” – it’s our world, nature, and “Logos” – a science investigating human behavior’s impact on nature.

Comprehending

ICT games, films (e.g. Wall-E (2008) that help children to get better comprehension, knowledge. Additional questions could be used to help children to figure out why we need to sort garbage. (Answer: it takes different term of time for various garbage to disintegrate). Maybe we can recycle garbage? What things are recyclable? How and why do we recycle? (Possible answers: old things look unattractive, we get bored from them, cannot be used longer. If recycled it will become new again and we can use it again).

Applying

Think and use second raw materials, make an imaginary think (toy or hero, spatial figure). Children can work alone or in pairs, groups.

Analyzing

How do you preserve nature? If there are no dustbins around, where do we put trash? What will happen if we throw all garbage on the ground?

Experiment

"Garbage disintegration": three boxes with different sort of garbage in them (glass, paper and plastic) are buried into the ground and observation is carried on how long does it take till the garbage disintegrates.

Synthesizing

Create a story, fairy tale *"Little trash"* or *"The story of the trash"*.

Evaluating

What evidence will show that the teacher and students are satisfied with the results reached?

What can I do, change in order to reach that nature should be less polluted? Additional teacher's question can be formulated to help children to formulate their ideas, thoughts.

Creating of educational environment

How it will be prepared?

- encyclopedias, books, stories.
- creating the Mind Map from children drawings.
- film watching *"How long does it take for garbage to disintegrate?"*
<https://sveikata.tv3.lt/straipsnis/per-kiek-laiko-suyra-siukšlės-2046>.
- practical task *"How do people pollute nature?"*
- children' answers to questions, raising question themselves while performing tasks, fulfilling the tasks to the end.
- children' active involvement into activities.
- positive children' emotions.

Description

Children get acquainted with the word *"ecology"*.

Watching of slides *"Ecology"*.

- ICT games, films.
- Discussion, brainstorm:
- How to sort household waste?
- Can an unnecessary thing turn into another thing, e.g. into a toy, book?
- Creative decisions of children how to use secondary raw materials according STEAM program, mathematical images, and spatial figures.
- Practical task – sort the garbage.
- Create a story *"Little trash"*, create the characters of the tale using second raw materials.
- Experiment *"Garbage disintegration"*: three boxes with different sort of garbage in them (glass, paper and plastic) are buried to the ground and observation is carried on how long does it take till the garbage disintegrates.

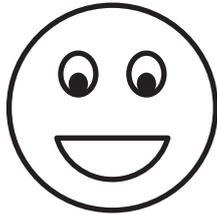
Questions developing critical thinking:

- Why do we sort garbage at home?
- Can we throw trash on the ground? Where must we put them?
- If there are no dustbins around, where do we put trash?
- How do you preserve nature?
- What will happen, if we throw all trash on the ground?
- If you get bored with your toy, do you need to throw it away? Where?
- How the process is called when new things are got from old ones?

- Where we have to throw our old paintings?
- Where we have to put Christmas trees after Christmas?

Self-assessment criteria. Criteria of teaching results evaluation.

*Conversation
with children*



What new things have they known? What do they like, don't like?
Why do they not like? What need is of the knowledge the have got?
How will they apply the things they knew?

Additional tasks:

- Creative improvisation: to make a child's work from second raw materials in a group.
- To visit "Young naturalists center".
- Excursion to "Švara" ("Cleanness") – an enterprise gathering and recycling garbage).
- To organize an exhibition of children works made from second raw materials and invite to it other children, parents and teachers.
- To clean kindergarten's environment.
- Make illustrations to the stories about garbage children created themselves.

*Author: Aušra Šlemo
Kaunas kindergarten "Giliukas"*

Topic: WORKING WITH A TEXT OF A FAIRY TALE

Target audience: 7 years old, Grade 1. **Subjects:** Mother tongue, Social Sciences, Class lesson.

Aims: working closely with the text to find the necessary information, to train and improve memory and thinking processes of students such as the acquisition of information, the processing of information and the adoption of a decision in order to express oral attitudes.

Pupils will develop the following Students will develop the following competences:

- development of pupils' reading skills;
- ability to find the information what they need in the text;
- ability to analyze events, activities, issues and etc.;
- structure information and build independent conclusions;
- develop skills for decision making and / or proposals to solve the problem;
- develop pairwork skills.

Teacher's expectations and the role of students

Students:

- will be able to formulate the goal of the lesson and the expected results;
- will develop their reading, writing, speaking and listening skills;
- will work with information while working with a text;
- will work in pairs;
- will learn to answer questions that are deliberately asked to develop certain skills of thinking, behavior, co-operation and individual activity;
- will develop their memory, visualization and drawing skills;
- will visualize the information in the text and transfer it to real life experience;
- will provide feedback on the achievements at the end of lesson.

The role of the teacher in the task and presentation:

The pupils will work in pairs and independently. There will roles of actors and participants assigned in the lesson and the students will be encouraged to share their personal experience and thoughts in order to promote critical thinking processes.

The teacher will use the "Six Thinking Hats" Critical Thinking method in simplified way with the First Graders using six color cards in the lesson. The method focuses on problem-solving attitudes and roles, and ensures that participants in the discussion do not compete with each other, but tend to think in a similar way.

Up to 24 participants can take part in the activity. The time needed to apply the method can range from 30 to 120 min. The time depends of the task.

The participants will be introduced to color cards and their significance before launching the discussion. They follow the discussion on the question given. If at some point of the discussion the teacher feels that the process is starting to struggle; for example, the participants are overly critical or negative, or too complacent with the solution, the teacher will ask the pupils to address the issue with a "thinking color". For instance, yellow is used to draw attention to opportunities or green to draw attention to alternative solutions.

Usually this method is used with hats which can gradually be introduced in Grades 3 and 4.

Edward de Bono created a six-point hat method to improve thinking efficiency. Putting one of the hats on the head activates a certain type of thinking. The author uses the hat as a metaphor for thinking, because culture has a rooted association between thinking and a head – hat. The hat illustrates the

role that each participant has taken in this moment. The hat is easy to put, remove and is noticeable. It is also the type of thinking that a person uses. Throwing a hat puts emphasis on color or style. By choosing a way of thinking, emphasis is placed on the process and purpose.

WHITE HAT – related to objective facts, **RED HAT** – emotional view, **BLACK HAT** – critical evaluation of the idea, **YELLOW HAT** – concerned with optimism and positive thinking, **GREEN HAT** – engaged with creativity and new ideas, **BLUE HAT** – related to control and process monitoring.

Students' role in the activity:

Work with text.

- Students are offered a text for reading (according to the level of reading techniques and capacities) or text audio / video recording. The student, working with the textbook, works with the text to obtain the necessary information. The type of questions and answers used to work with the text.

Work in pairs.

- Students will be able to work in pairs (pairs help to develop speech skills in native language lessons in the primary school)

Targeted task completion.

- Students independently analyze sources of information, questions, objects, phenomena, etc. in accordance with the work plan.

Work independently: collect information, analyze it, structure it, compile, draw conclusions and answer questions.

The teacher (or students) orally asks questions related to a specific topic and elicit students' answers.

Problem solving.

- The teacher or students formulate the problem or question to which the answer should be sought. Students clarify the issue, devise a solution plan, implement it, evaluate the result and find out if it is a solution to the problem and if it is not possible, find other solutions.

Situational analysis.

- The analysis usually utilizes real-life situations (events) that students can relate to their experience. Events for situational analysis can be depicted in a text, drawings, photographs, videotapes or audio recordings. Students listen, read or watch the material, receive a specific task (for example, find the situation, predict the course of events, and choose a suitable solution), express their thoughts and possible options of the solution. They discuss and evaluate the outcomes in pairs, make a joint or the most appropriate decision, define the most appropriate solution and in the end report on the results of the work to the other pairs.

Exercises.

- A teacher offers a few similar tasks to students for strengthening certain knowledge or skills. Pupils repeat more similar actions that help to automate the use of knowledge or skills, to acquire or enhance physical or mental qualities or abilities.

Students will learn how to process information: explain, compare / contrast, classify, interpret, analyze, draw conclusions, set sequences, synthesize, search information, etc.

Students will answer questions.

What is The role of the teacher in the task and presentation?

The teacher deliberately designs tasks, foreseeing how the content affects the pupils' thinking, what level of thinking skills are developed within a specific task.

Thinking is visualized and / or discussed.

- Training Sources: student's worksheet, teacher's worksheet, teacher's presentation with a bear and mouse images, fairy-tale pictures.
- Questions that stimulate thinking.

HOTS (higher order thinking task) questions for task 1 to understand how students understood the text:

What were the living beings told in the fairy tale? Who slept on his nose? What did he catch? Why did he grab? What did the mouse do when it was caught? What happened to the bear on another day? What did the mouse do? How did the fairy tale end?

HOTS (higher order thinking task) questions for Task 5:

What did the bear catch? How did the mouse get out of the beard? Why did the bear laugh? Why did the mouse help the bear? What conclusions can you make on a mouse or a bear? Tell me when you're like a mouse or a bear! Which role - the bear or mouse would you choose and why?

- Tools and methods of creativity and critical thinking: working with text, working in pairs, question – answer method solving problematic issues, case studies, exercises.
- Creative and critical thinking products/ outcomes: develop students' memory and thought processes, which include the acquisition of information, information processing and decision-making, to express their attitude to oral Task 5.
- Each student could get one of the six color cards (white, red, black, yellow, green, or blue). An audio recording is made during Task 5. Audio material is a direct feedback material and proof of the work done.
- The teacher prepares 6-color cards (at least 5 of each color according to the number of pupils in class) using the six "thinking hats method", each color is characterized by shades of answers to the questions:
 - White color – objective facts
 - Red color – emotional view.
 - Black color – a critical evaluation of ideas.
 - Yellow color – optimism and positive thinking.
 - Green color – creativity and new ideas.
 - Blue color – control and monitoring of process.

Blue card can be received by the student who works well in a pair; to the frontal work has any incentive to talk, but the process is observed, understood and controlled.

Creation of a learning environment. How will the educational environment be created?

- In what environment (traditional and non-traditional) will the learning take place in order to complete the creative and critical assignments?

Work is provided in the study room. Pupils arrange their work places and prepare for work. The pupils receive a worksheet with a reading text (Latvian folk tale) and six-task terms. All pupils read the terms of reference together with the teacher and work with the teacher. Prior to task 4, the teacher indicates that the pupils completing the last assignment can also draw on the other side of the worksheet given.

The work is designed for one class, during which one or two short breaks can be scheduled. These may be related to the content of the work.

What tools will be used in the physical environment, why?

Worksheets are used by the pupils and the teacher without additional materials, also chancery and color cards.

What learning sources, equipment, IT technologies will be used, why?

Screen and projector for visualization and display of worksheets for front-end work.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

The proof will be the 5th task, the audio recording and the feedback given by the students, which will result in each pupils receiving at least one card of some color.

Activity evaluation criteria. Assessment criteria for learning results (products) .

Teacher-selected assessment and self-assessment tools are the following:

- feedback provided by pupils in task 5 and oral self-assessment thereafter;
- evaluation of worksheets according to the following criteria.

Criteria for Critical Thinking Assessment (for the teacher only):

Assign no.	Conditions for the tasks given on the worksheet	Evaluation criteria	Indicators	Maximum number of points
1.	Read the fairy tale and write the name of the fairy	Reading	Read correctly and knowingly – 2 p. Read – 1 p. (the teacher can also take an attention the pupil's previous reading skills)	2
		Text	Construct the title according to the read text – 2 p. for a chosen headline "Bear and Mouse"	2
		Sentence	It is possible to write separate sentences according to the written sentence (capitalization is 1 p. the end of the sentence is 1 p.) – 2 p.	2
		Thinking	Execute the task conditions according to the instructions – 2 p.	2
2.	Choose and delete the superfluous sentence in the story	Reading	Take the subject in its reading text – 3 p. for a scratched sentence "Wolf Waiting for Sarkangalvite", which does not correspond to the subject of the text	3
3.	Tell each other, what do you remember from the fairy	Speaking	Collaboration	Blue card
4.	Draw and write names of the main characters in the fairy	Reading	Recognizes fairy-tale heroes and draw them – 1 p. for each	4
		Writing	Writes main character's names – 1 p. for each	
5.	Reply to the questions asked by the teacher Questions/ answers	Speaking	Telling	Color cards
Acquired total number of points				15

Short conclusion. Teacher's reflection.

There are various obstacles to a successful debate. People take on one role and do not want to leave, such as "eternal critic"; people are tuned into each other and look for the other points they say; after the idea is put forward, complacency arises and people do not continue to think about alternative solutions. Depending on how the Thinking Hats method is used, it allows you to look at the problem from different points of view or to "single-boat" all participants, thus forcing people to violate their roles and think together in the same direction, while avoiding a ban, stuck in conformation.

Students compare their feelings at the beginning of the lesson and at the end of the lesson. During the work, the use of thinking hats in practical – real life is emphasized. Measuring can only be the result of a discussion that will be recorded in the audio and where it will be reflected, or whether all students have understood the main idea of the fairy tale and its instructive role or have come up with a common idea and implemented it.

Tips for Parents

1. Engage in the development of child's critical thinking skills with a positive attitude.
2. Read in front of or read the Latvian folk tales together with the children.
3. Help the child to understand and reveal fairy-tale events to develop memory, logical thinking, and search for relationships in family events.
4. Learn a variety of opinions, options and techniques before deciding.

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*Author: Sandra Graudina
Education and Information Services of Riga City (RIIMC), Riga, Latvia*

Topic: YOU AND I = WE

Target audience: 7–9 years old, Grades 1–3. **Subjects:** Social science and Teacher’s classes.

Aims: to emphasize student’s personal role and responsibility in making their class work as a collective.

Pupils will develop the following Students will develop the following competences:

- Building positive relationships with classmates.
- Realizing their own importance and place in their class.
- Developing ability to discuss, collaborate and listen to opinions.
- Improving personal communicational and collaborative skills and characteristics.
- Developing ability to make decisions.
- Improving student’s self-regulating skills.

Expected results

Students will:

- determine their current knowledge, which will be expanded with new information;
- working independently and within a group, students will see themselves as a part of the class;
- develop discussion skills, accept other classmates’ thoughts and opinions;
- develop skills to think analytically and critically, make decisions, further the understanding of the problem;
- learn by doing;
- pay attention to real life situations and find alternatives, apply knowledge from lessons to solve real problems.

Teacher’s expectations (or the role of the students)?

Using the case study method in class, students work individually, in pairs and as a whole class, actively participating and listening, sharing their personal thoughts and experiences. The method usually involves real-life situations (events), which students can associate with their own experience. Material for the analysis of the situation can be provided as texts, drawings, photos, video and audio recordings. Students listen, read or watch the material, receive specific instructions (e.g., to find the cause of the problem, predict the course of the events, determine a suitable solution), share their guesses within a group, generate possible solutions, discuss and analyse them, make a mutual decision on the most suitable solution and share their results with other groups.

The aim of the situation analysis:

- to create an active learning environment, where the problem discussed reflects real life issues;
- to improve the class ability to identify problems, causes and consequences and develop decision making skills;

The lesson will be based on principles of critical thinking, involving initiation, realisation and reflection phases. Using 6 critical thinking questions (Who? What? Where? When? Why? How?), students will learn to collect and compare information, explain, make decisions, find proof and etc.

Students’ role:

- to express their thoughts and feelings about their experiences, work in a group, get involved in discussions and games, create learning results and introduce them to the rest of the class;
- to recall already known facts, compare, interpret and find out the essential essence;

- to reflect on and analyse their work, by posing problematic questions.

How does Kristīne see her classmates' actions?

Why doesn't Kristīne have friends?

What is the the role of the teacher in the task and presentation?

Teacher asks students to take their places at the group tables (groups are managed before the lesson).

Teacher introduces th topic of the lesson: You and I = US

Teacher recounts A. Smagar's poem "Joy".

Teacher asks students to remember happy moments, words, sincere and joyful days in their class that week.

HOTS (higher order thinking task):

- *Have they received any nice words or a helping hand from their classmates? How did they feel then?*
Students express their thoughts and feelings about what they have experienced during the week.

Teacher gives every group a worksheet "Relationships in class and at school" (see Attachment 1) and encourages students to think about the negative and positive aspects.

- *What have they observed in their personal relationships? What are they like? What can they say..? How can they..?*

First, students work in groups, then get involved in discussions about what has been achieved. Afterwards each group introduces the results they developed. After the discussion the worksheets are put up on the whiteboard.

Teacher asks students to watch a video about relationships at school.

<https://youtu.be/ORhMZSA9NJM>

By asking questions the teacher encourages students to get involved in a discussion.

- *How do you see Kristīne classmates' actions? Why, in your opinion, Kristīne doesn't have friends? What is important? What is positive and what is negative? What impression does it leave on you? What do you think about it?*

Students express their thoughts and reflections, discuss, share their version of the situation and put forward a solution for it.

After the discussion the teacher asks students to play a game, called "A Friendly rabbit".

Instructions for the game: the teacher holds a soft toy rabbit, saying something positive and specific about the student the rabbit is given to, then it is passed on to the next student who hasn't heard anything positive about themselves. The game can be continued until everyone has taken part (can be repeated multiple times).

Teacher thanks the students for kind and sincere words, which students have said to each other and asks each group to take their seats.

Teacher gives out worksheets "My class values" (see Attachment 2) suggesting groups to discuss and pick five values characterising their class. Each particular value is rated from 1 to 5 (using stamps).

Teacher asks each group to share their values with other groups.

- *What changes would you make? What needs to be done? Would it be better if...? Etc.*

Teacher introduces a summary of each group's work, emphasising values which students have put forward: FRIENDSHIP, HELPFULNESS, HONESTY, HONOUR, DILIGENCE, RESPONSIBILITY and CURIOSITY.

Teacher encourages students to protect and develop these values in class by inviting them to join a dynamic pause activity "Trust!"

Instructions for the game: Students in their groups stand in a line one behind the other; each group chooses a leader, who is blindfolded and stands in front of the group. The rest of the participants put their hands on the shoulders of the person in front of them. Then the whole group is led by the blindfolded person all around the classroom.

Teacher thanks all the groups for participation and for being responsible during the game, the leaders of each group are also thanked by their individual group.

Creation of educational environment. How will the educational environment be prepared??

Materials:

- a computer or a tablet;
- lessons take place in a traditional classroom;
- a tablet for each student;
- magnetic whiteboard, magnets;
- worksheets, stamps;
- objects for a dynamic pause – a rabbit made out of fabric, a scarf.

Assessment (the proof that students and teachers are satisfied with the results):

Student's learning success is achieved together with the help of the teacher and other students, emphasising their personal role and responsibility in creating a collective outcome. Positive relationships between classmates are developed, skills to discuss, listen to opinions and cooperate are improved and self-regulation skills.

Self-assessment criteria help students to evaluate their personal progress.

The teacher asks every student to take their tablet, open and complete a lesson's evaluation questionnaire (see Attachment 3). The teacher creates a diagram that represents students' responses to the questionnaire and encourages them to share their opinions.

- *Do you agree? What is your opinion? Could it be better if...?*

Topic

- Analysing students questionnaire answers, it can be concluded that they enjoyed the lesson, as they worked individually and in groups.
- All students got along well in groups.
- Students actively participated in discussions, expressed their thoughts and reflections.
- Lesson's environment was friendly. The students were working close together in groups as a whole class. The aim of the lesson was achieved.
- To continue developing class's main values, develop students' communication and collaborative skills.

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Topic: MIND MAP: MY BEST FRIEND

Target audience: 8–9 years old, Grades 2-3. **Subjects:** Languages, Social and Teacher's lessons.

Aims: by using the mind map, form a story (introduction, main body, ending), prioritising information to tell it quickly and in detail.

Pupils will develop the following competences:

- realise their role in different situations;
- develop communication and social skills and abilities;
- understand themselves, be conscious of their attitudes and actions;
- develop ability to plan and deliberate learning processes and outcomes;
- develop ability to make decisions;
- improve originality and individual thinking;
- improve personal adjustment skills.

How will the creative and critical activity develop students?

- cooperative and individual activity (students will develop their communication skills in creative, actions, conversations working together and individually);
- thinking (students will promote creative and critical thinking, by listening and understanding their classmate stories, by analysing the type of a story and its content)
- speech development (expressing opinions by speaking clearly, using a varied vocabulary depending on the situation, take in information by listening, answer questions)

Teacher's expectations (the role of the students)

Students will work individually and together, actively listening and participating, they are encouraged (supported) to share personal thoughts and experiences by using Mind Map method. It is not only meant for oral activities but also to develop written essays. It is built like a game, because by following the instructions and answering questions in full sentences, shaping their story are not only simple but also interesting. At the same time students become acquainted with the structure of a story, identifying the introduction, main body and ending which is marked on the mind map in different colours.

When making a mind map first the aim needs to be set. Then, a draft of the mind map needs to be made, which is designed by drawing lines from the middle of a circle.

Tony Buzan's suggestions for making a mind map - making associations, clear questions, creating a hierarchy - by using lines of various thickness, different colours, creating an individual style.

A lesson will be based on principles of critical thinking – initiation, comprehension, reflection stages. By using 6 critical thinking questions (*Who, what, where, when, why and how?*) students will learn to gather, explain, analyse, make conclusions and find proof for them etc. With the help of Mind Map method they structure threads of thought; to begin with the general and move on to more specific information and then to details to create a story by following directions.

Student's role: to recall already known facts, compare, interpret, find a meaning, illustrate, gather, classify, find causes and motives, prove understanding of coincidences, gather information, combine existing knowledge in new ways, make and use original conclusions and judgements, solve problems.

Student's role: reflect and analyze the created story, ask questions.

What would you do, if you didn't have friends?

Why do people need friends?

The role of the teacher in the task and presentation:

At the beginning of the lesson the teacher offers students to watch Atom Art studio's animation film "*Ursus*" (director; Reinis Petersons, 2011)

The teacher introduces the exercise and questions, using Bloom's classification steps.

Existing knowledge and notions

Teacher involves students into active participation, by asking simple questions (Who is...? Where is...? When did this happen?)

Students, who share their knowledge at this level, can expect such types of answers - it isn't interesting without friends, with friends you can play etc.)

Understanding.

The teacher encourages students to prepare their story about their friend by using the mind map, to prepare it accordingly to the given plan - by answering questions.

- Tell us, does everyone have friends?
- What role do friends have in your life? Etc.

Analyze

Students analyse what is necessary in order to be a good friend. This is where questions arise, so by analysing a student can think deeper.

- What is necessary, so you can have a good friend?
- What characteristics someone must have?

Synthesis

Students gather information, combining existing knowledge in new ways, creating original conclusions and judgements with the help of questions.

- If your friend was here, what would you tell or ask them?
- What will happen if...?
- What would you do, if...?

Assessment

With the help of questions students assess, justify, criticise, determine regularities, questions are posed.

- Do you agree...?
- What is your opinion on...?
- How meaningful is...?
- What is the value of...?
- What do you suggest to...? How do you rate...? Why is that better than...?
- What would you do if you didn't have friends?
- Why people need friends? etc.

At the end of the lesson the teacher invites students to write a letter or note to their best friend (can also be assigned as homework).

Creation of learning environment. How will the educational environment be achieved?

- the lesson takes place in a traditional classroom;
- computer, projector, screen, animation film;
- each student is given a mind map and some stationary.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Student's learning success is achieved by working together with the teacher and other students. To prove the ability to apply the acquired knowledge and skills, the students will need to develop and advance in these competencies.

- active participation of students and developed mutual collaboration skills and attitudes;
- positive student emotions;
- student's answers to questions, proposing questions during the exercise, at the same time solving problems.

Activity evaluation criteria. Learning results (products) assessment criteria.

Self-assessment criteria which helps students to self evaluate.

Self-assessment on balloons.

- colour the balloon in a colour that best shows how you are feeling right now.
- draw a face, that best expresses how you felt during the lesson
- write three things you learnt about friendships
- What did you enjoy the most during this lesson (why?)
- What would you like to do differently?

Short conclusion. Teacher's reflection.

The animation film made students re-think their relationships with their friends, they were encouraged to share their personal experiences and thoughts. Students were working hard together and individually, were active lesson's on-lookers, listeners and participants. By using the mind map, students were describing their best friend quickly and broadly. Mind map is not only useful for an oral story but also when forming a written story. It is designed as a game, following instructions and answering questions in full, shaping the story is not only simple but also exciting.

At the same time students familiarise themselves with the different parts of storytelling, by separating the introduction, main body and ending, which are marked on the mind map in different colours.

Students who have learnt how to work together with others have a higher self esteem, more positive relationships are established which cultivates motivation to learn, develop their network of friends and make friendships last longer.

By observing students's work, the teacher made conclusions about how thinking skills are being used by asking to describe how students worked, what routes they chose and what and how they were thinking. The lesson was based on the principles of critical thinking.

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Topic: A BEAUTIFUL HORSE

Target audience: 8–9 years old, Grade 1-2.

Aims: the aim is to enable students to:

- analyze material;
- formulate a verbal and specific answer to the question;
- systematize information;
- work in a couple.

Different methods will help you achieve the desired results:

- Mind Map (bubble). Children will get the scheme ready, they will have to fill it.
- Game (Think and Show).
- Using a QR code reader.

What are the teacher's expectations for the pupils?

- Students will be able to work in pairs (play).
- Will be able to process information (interpret, analyze).
- Use thinking tools (mind maps, game).
- Apply information (evaluate, generalize, visualize).

Reflect: (Students need to answer the following questions:

1. What did I learn?
2. What was important? Why?
3. What was useful?
4. What did you do well?
5. How much do I enjoy?
6. What are the difficulties?
7. Was there any useful activity?

What is the role of the teacher in the task and presentation: in the task of the students?

Thinking questions:

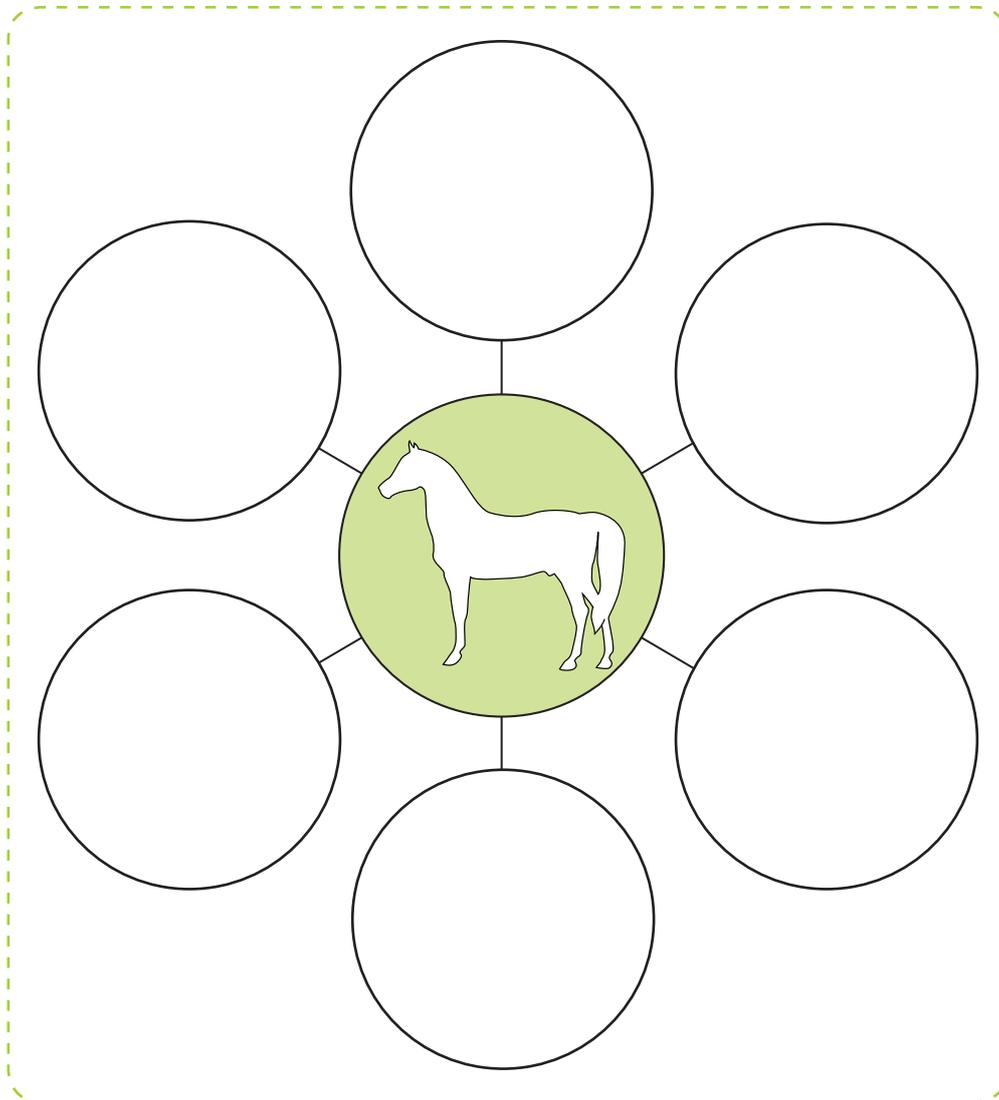
- Where and how does a horse help a person?
- Why horses need a horse?
- How do you think horses are communicating with each other? If so, how?
- Who helps to tame the horse?
- What helps the horse protect itself from flies?
- How do you think a horse (missed) would find a way home? Why do you think so?

Tools and methods for creative and critical thinking: Mind Map "Bubble"; game; casting.

Products / results of creative and critical thinking: completed Mind Map; the depicted situation is depicted; video preview.

Scaffolding

Pupils get a worksheet with a prepared bubble Mind Map (Appendix 1). They have to write what they know about horses: write adjectives describing the object in the outer bubbles (what?). Then all together briefly discuss who wrote and replenished.



Think and Show Game

Making as many leaflets as classroom pupils (Appendix 2). Each statement is followed by a different statement. Pupils pulling out the same statements work in pairs. They discuss how to play that horse. Others then try to guess what they played.

The horse is pulling the chariot	The horse is leaping
The foal cannot find Mom	The horse is plowing the field
The horse is performing in a circus program	The horse is running on the crossing
The horse is trying to rid the rider	The horse is kicking
The horse is eating apples	The horse is asleep standing
The horse is yawning	The horse is grazing in the meadow

Interesting, unexpected facts about horses: (You can make a slide show)

- *The ancestors of the horses had fingers.*

Evolution changes animal species very much in millions of years. Here, the ancestors of the horse had fingers, not the canoes. Modern horse hooves are essentially fingers, or what evolution has created from them. By the way, horse hooves are made up of keratin – a protein that makes up our nails and hair.



- *Horses graze on herds.*

Horses are social animals. Wild horses graze in 3–20 horses. The leader of the group is always a strong stallion, and all other members are mares and chicks. As young males become stronger, they are outgrown and usually grazing in small male herds until they are able to form their flock. Individual horses usually feel poor – they need to be in touch with other species. By the way, it is said that the only true herd of wild horses is grazing in Mongolia.



- *Horse eyes are incredibly large.*

Horses' eyeballs are the largest among all land mammals, including giants such as elephants and hippos. What's more, horses can see almost everywhere around them - their field of vision is very wide. This is because they are herbivores and have to look out for predators and look for food efficiently. Domestic horses are more often short-sighted and wild are far-sighted. For a long time, it was thought that horses see a black-and-white image, but that is not the case - their vision simply gives a yellow and green color.



- *Horse riding has long been a mystery.*

Everyone knows that horses are very fast – so they are racing. However, in the absence of modern cameras, it was very difficult to examine the rhythm of their running. In 1872, the famous US businessman Leland Stanford raised the idea that at least one horse at full speed had all its hooves risen from the ground. Not all of them agreed, because looking at the naked eye it seemed that the earth was touched at least by one horse horse at any time, unless he was jumping. 24 chambers and a racing horse were used to figure out this riddle. And so, Stanford's thought was right.



- *Horse brain are smaller than humans.*

The human brain weighs about 1.2 to 1.4 kg, while the horse's brain weighs only 600 to 630 grams. The oral cavity occupies a larger part of the head than the brain. However, it does not make the horse very stupid – they often come up with how to open the gate, get rid of the shackles, remember the delicious food, and recognize the people.



- *Warning sign.*

If you ever see a horse with a red ribbon on the tail at any show, horse race or other event, be aware that it is not closer to it. This is a sign of warning that the animal is kicking.



- *Horses are fast runners.*

Probably nothing surprising is that the horses are fast, at whatever speed they run? The highest racing speed was recorded in 2008 – the Winning Brew mare reached 70.76 km/h. However, it is said that horses can reach 88 km/h. Horses can also be very durable. Arab horses are said to be able to run 160 km without rest.



- *The smallest horse.*

Miniature horses that are smaller than ponies (or may be considered small pony) are often kept at home as dogs or cats. They are specially bred to be friendly and willing to be among the people. However, they retain the essential instincts of fighting, so the owners should always realize that it is not a dog or a cat. In the Guinness Book of Records it was recorded that in 2006 the world's smallest miniature horse was just 44.5 cm tall.



- *Gourmets.*

Horses have a sophisticated sense of taste. They are very picky for food: never eat spoiled oats, poisonous plants, drink water with bad breath, impurities of harmful substances.



- *Long-lived.*

Mareng, a French Emperor Napoleon Bonaparte, has reached a record of longevity for 63 years. In England, Billy survived 62 years. The average age of the horse is usually 30–35 years. The horse grows up to 5–6 years. He is the most active for 4–5 years and keeps his working qualities up to 18–20 years.



- *Horse Games.*

In many parts of the world, a variety of rider games are available - they can be counted up to 50. The most popular of these is polo – horseshoe hockey. In England, Czechoslovakia is playing horse football. Two teams of 5 horsemen competed. The projectile is about the size of the horse. Chenoburt played in Georgia – riders have to put a ball in a basket. All games are divided into several groups: ball games, spear throwing, racing between riders, speed racing, horse riding and chase.

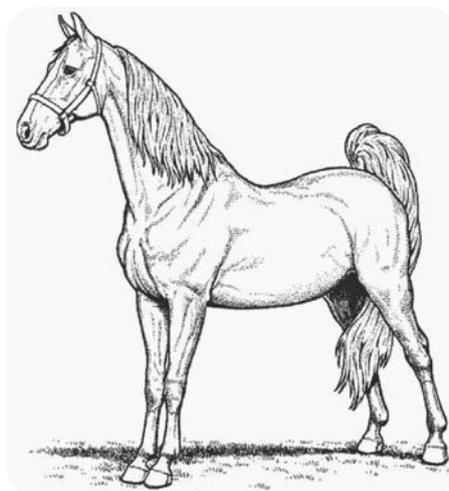


- Students are now refreshing their mind maps because they have learned a lot of new information.
- Each student receives a QR code (Appendix 3) and scans it.



The tablet has a dedicated gadget. Watch a short movie about the most beautiful horse species in the world.

- If there is time and willingness to use the additional task (Appendix 4). A split horse picture is split for each or a couple. Pupils have to put it together, glue and color.



Creating an educational environment. How will the educational environment be prepared?

- Activities take place in school, classroom.
- Tools used: various pictures (representing horses), paper sheets for thought maps, video material, QR code.
- Smart board used: for slideshows; tablets: for video.

Evaluation (What will be the evidence that pupils and teachers are satisfied with the results?)

Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

Selected aspects of teacher assessment:

- Originality (peculiar, unprocessed, unique, authentic, unpredictable product or solution without analogues).
- Smoothness (novelty).
- Tolerance (tolerance for ambiguity, uncertainty. Ability to understand other than myself).
- Imagination, fantasy (creating new images, seeing an activity or a result before the final activity).
- Sincere and empathic listening (assigning your mental energy to other people's ideas and thoughts, understanding other attitudes and feelings).
- Raising Questions and Understanding Problems (searchable problems).
- Thinking together (ability to work and learn together with others, in a team).
- Clear and accurate thinking and communication (clear language in oral and written communication, avoiding generalizations, distortions, inaccuracies).

Tip for parents:

Visit the stud farm.

*Author: Diana Kairiūkštienė
Kaunas Panemunė primary School*

Topic: EGG

Target audience: 8–9 years old, Grade 1–2.

Aims: the aim is to enable students to:

- analyze material;
- formulate a verbal and specific answer to the question;
- systematize information;
- work in pairs.

Different methods will help you achieve the desired results.

- Mind Map (Circle). Children will get the scheme ready, they will have to fill it.
- Various studies.

The teacher's expectations

- Students will be able to work in pairs (research).
- Will be able to process information (interpret, analyze, draw conclusions).
- Use thinking tools (mind maps).
- Apply information (evaluate, generalize, investigate).

Reflect: (Students need to answer the following questions:

1. What did I learn?
2. What was important? Why?
3. What was useful?
4. What did you do well?
5. How much do I enjoy?
6. What are the difficulties?
7. Was there any useful activity?

What is the role of the teacher in the task and presentation?

Thinking questions:

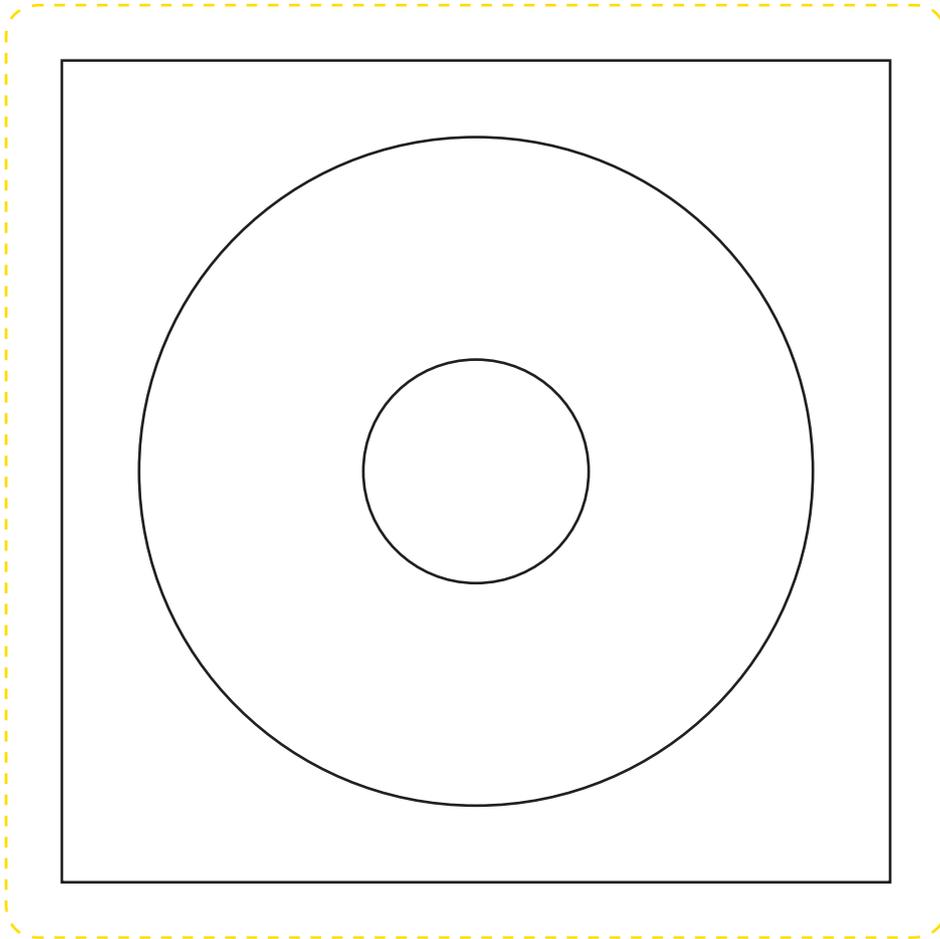
- What happened before: a hen or an egg? Why do you think so?
- Why does a fresh egg sink? Why do you think so?
- Why does it float in salty water? Why do you think so?
- Can an egg stand on the table?
- What quality of egg white do you know?
- Why does the protein scab become stiff?
- Is it easy to squeeze the egg shell? Why?

Tools and techniques for creative and critical thinking: circle of Thinking Circle; tests.

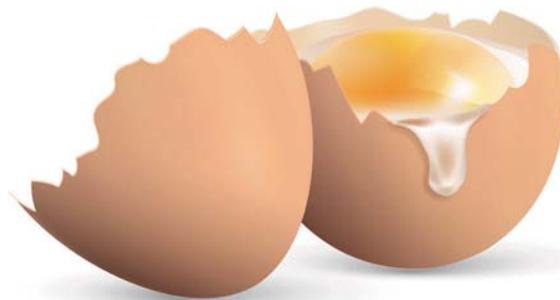
Products / results of creative and critical thinking: completed Mind Map; conducted studies, results and conclusions.

Scaffolding

- Pupils get a leaf with a prepared map of 'circle' thinking (Appendix 1). They have to write what they know about the egg: between the central and the outer circles, write everything they know about the egg. The signature of the outer circle from where it knows. Then, with a friend of the bench, he compares his knowledge and adds maps.



- Getting to know the structure of the egg.
- Performs pairs testing.



Is the egg fresh?

You will need: fresh and non-fresh eggs, two glasses of cold water.

The egg should be immersed in a glass of cold water. If it is fresh – drowned, if not – float.

Conclusion: Water is evaporated through the holes in the shell, which makes the old egg lighter and does not sink.



Hanging egg.

You will need: two eggs, two glasses, a teaspoon, salt, water.

Fill two glasses of water and dissolve a lot of salt in one of them. When the egg is placed in a container with water, the egg drops, and the other egg in a bowl with salt – he smashes like a vicious in the middle of the dish.

Conclusion: Salty water density is higher than fresh, so the egg floats in it.



Rubber egg.

You will need: egg, 9% vinegar, and a jar.

We put the egg in a jar and pour vinegar. We keep for 2–3 days.

We observe: the shell disappeared and the egg became rubber.

Conclusion: vinegar dissolved the egg shell and made it as a rubber yolk and protein.

- All the research done and the results are unlocked, shared with their observations and emotions.
- You can be warned by riddles:
 1. Without hands, without an ax house. (Bird is nesting nest)
 2. Straw soil, stoned with stones, live sprouts. (Nest and eggs)
 3. Go for a lady in a mansion with a hundred dresses. The breeze is a pure body. (Chicken)
 4. Double-born back ache. (Chick)
 5. Cucumber comes on two cuttings, with the mouth of the meat, with a beard. (Cock)
 6. Bone mouth meat beard, born twice, dies once and the devil is not afraid.
 7. Twice is born, once dies. (Egg or bird)

Creating an educational environment. How will the educational environment be prepared?

- Activities take place in school, classroom.
- Tools used: various photos, paper sheets for thought maps. Eggs, glasses, vinegar, salt, spoon, water.

Evaluation (What will be the evidence that pupils and teachers are satisfied with the results?)

Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

Selected aspects of teacher evaluation.

- Originality (peculiar, unprocessed, unique, authentic, unpredictable product or solution without analogues).
- Smoothness (notoriety, novelty).
- Tolerance (tolerance for ambiguity, uncertainty. Ability to understand other than myself).
- Imagination, fantasy (creating new images, seeing an activity or a result before the final activity).
- Sincere and empathic listening (assigning your mental energy to other people's ideas and thoughts, understanding other attitudes and feelings).
- Raising Questions and Understanding Problems (searchable problems).
- Thinking together (ability to work and learn together with others, in a team).
- Clear and accurate thinking and communication (clear language in oral and written communication, avoiding generalizations, distortions, inaccuracies).

Tip for parents:

At least one of the tests at home.

*Author: Diana Kairiūkštienė
Kaunas Panemunė primary School*

Topic: WHAT WOULD HAPPEN IF ALL THE TOYS DISAPPEARED IN THE WORLD?

Target audience: 8–9 years old pupils, Grade 3. **Subjects:** Technology, Science.

Aims: find out what children played in different historical periods and make the toy themselves.

Related topics: childhood, toy and game history, toy production.

Students will develop the following competences:

- ability to analyze the situation;
- interest in the history of your country and the world;
- ability to communicate and collaborate;
- creativity in solving problems.

What is the goal of the task? It is recommended to focus more on the result – pupils will create, evaluate, analyze. WHAT?

The pupils will imagine that one day all toys will disappear in all over the world. Find out what children played in different historical periods and make the toy themselves.

How do creative and / or critical activities educate pupils?

The goal of this exercise is to develop pupils' creativity in solving problems, interest in the history of their country and the world. The task will encourage pupils to become creators, develop hand-made skills. It is important for the pupils to form the idea of having fun playing with their own toys.

Teacher's expectations (the role of the students)

Pupils will learn how to get to know their experiences from where their toys come from. They will create an original circle mind map "What would happen if all the toys disappeared in the world?" Find out what you need to become a toy maker yourself. They will make the toy themselves.

What is the role of the teacher in the task and presentation?

There is a conversation at the beginning of the activity. The teacher first speaks about the kind of toys he asks students about what toys they are playing. Then everyone is considering where and how the toys are made. The teacher asks students to create circle mind map in the groups "What would happen if all the toys disappeared in the world?". All pupils' thoughts are discussed, and it is emphasized that there are no bad answers. Pupils choose the most unexpected and interesting answer they think is. The teacher tells the children what toys the children have played in different periods of history. What measures will be needed to create a toy yourself? The toy is being manufactured.

Learning Sources – Youtube

1. https://www.youtube.com/watch?time_continue=23&v=6sYe3mBmWSE
2. https://www.youtube.com/watch?v=6YKygXPNa_E

Questions that force questions:

- Where do children get the toys from? How many toys does a child need? What toys do boys, girls play with? How do toys differ in different age groups of pupils? Are children's toys the same all over the world?
- What would happen if all the toys disappeared in the world?

- Can children be toy makers and manufacturers?
- What are the toys made of?
- What impact do toys of some types have on ecology?
- Do you need to store toys?

Tools and techniques for creative and critical thinking

“The Opposite” method – When a question is turned upside down, it encourages pupils to look for new ways to solve problems, pupils will learn to think in a non-standard way, avoid standard answers. Circle mind map.

Products / results of creative and critical thinking

Creation an original circle mind map “What would happen if all the toys disappeared in the world”. Handmade toys made by pupils.

Create “Scaffolds”: promote pupil’s desire to become creators.

Creating an educational environment. How will the educational environment be prepared?

- In what environment (traditional and non-traditional) will the training (s) take place in order to perform creative and critical tasks?
Students will learn in a traditional setting in the classroom, in the Toy Museum.
- What measures will be used in the physical environment, why? What learning resources, equipment, IT technologies will be used, why?
Web resources will be used for visualization and problem disclosure. A circle mind map will be used to reveal the problem. Selected materials such as paper, adhesives, fabrics, etc. are used to create the toy.

Evaluation

The assessment should take into account whether the pupil had ideas and suggestions for creating a mind map. Has he succeeded in becoming a creator in while producing the toy?

Criteria for self-assessment of activities

An individual idea for each student on the mind map.

The originality of thoughts and ideas.

Creating and presenting the toy.

The role of the family in this task could be:

Helping to find out more about children’s toys in the world in different historical periods.

Make more toys at home together.

Visit the Toy Museum.

*Author: Vilma Gaubienė
Kaunas Panemunė primary school*

Topic: THE CHALLENGE

Target audience: 9–10 years old students, Grade 4. Subjects: Technology, Ethics.

Aims: challenge yourself and create a plan to implement it.

Related topics, topics: Planning skills. Character features.

Students will develop the following competencies:

- ability to set higher goals;
- ability to plan;
- interest in your own personality;
- ability to communicate and collaborate;
- improve the public speaking skills, deliver your original ideas courageously;
- creativity in planning.

Recommended goal to be more focused on the result – the students will create, evaluate, analyze. WHAT?

Purpose. Based on the experience available, students will face a personal challenge. It will be depicted by creating an original poster, which will showcase the creative steps to reach the challenge.

How will the pupils develop in creative and / or critical activities?

The purpose of this task is to develop pupils' creative competences, interest in their own and friends' personalities. The task will encourage children to achieve higher goals, develop their planning skills. While carrying out the task, it is important to set and plan the achievable goals. Pupils inspired by new perception will appreciate the importance of planning. They will understand that written and continuously visible steps help to achieve the goal.

Teacher's expectations (the role of the students)

Pupils who have received the assignment will share their experience, what are their personal accomplishments.

- They will remember how they felt after important achievements.
- Pupils will determine what important character features are needed to achieve higher goals.
- Pupils will create an original poster called „My Challenge“. It will showcase the creative steps needed to meet the challenge. Planning will benefit from coherent Mind Map.
- The poster „My Challenge“ and the steps shown there will be presented to a group of classmates.

What is the role of the teacher in the task and presentation?

Sources of learning. Talk about various children's experiences after important events and achievements. A few inspirational ideas about interesting people's challenges. (Youtube)

Thinking issues:

- What are the challenges?
- What character features do you need to achieve higher goals?
- Is it possible to overcome the challenge without effort?
- Why is it important to plan for the goal?
- Is it important to write down the goal and read it daily?
- How do the planned steps help us to improve?

Tools and techniques for creative and critical thinking.

Talk about challenges, a coherent Mind Map.

Creative and critical thinking products / results:

Creating an original poster "My Challenge".

Create Scaffolding: information that promotes your personality, challenges, and plans.

Creating an educational environment. How will the educational environment be developed?

- In what environment (traditional and non-traditional) will there be training for creative and critical tasks?
- Students will learn in a classroom environment.
- What measures will be used in the physical environment, why? What learning resources, equipment, IT technologies will be used, why?
- Online resources will be used for visualization and disclosure. A coherent Mind Map will be used for planning. Selected materials such as paper, adhesives, pens, etc. are used to create a poster.

Assessment (What will be the proof that pupils and teachers are satisfied with the results?)

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

The assessment should take into account whether the student created a poster based on his personality. It is important that the steps that help to achieve the challenge are planned in a consistent manner and implemented in real terms.

Criteria for self-assessment of activities

Individual assessment of the poster created by each student.

Presentation of poster in groups.

The originality of thoughts and ideas.

The role of the family in this task could be:

Help the child to choose the idea of the challenge

Encourage continuous discussion of the success of the challenge

Brief conclusions. Teacher's reflection.

*Author: Vilma Gaubienė
Kaunas Panemunė primary school*

Topic: A CLASS COMMUNITY PROJECT. “CHRISTMAS TREE. NOW AND A HUNDRED YEARS AGO”

Target audience: 9–10 year old students, Grade 4. **Subjects:** Arts and Crafts lesson, Science lesson, Lithuanian (native) language.

Aims: on the basis of various sources of information prepare for the debate on “Artificial Christmas tree – a nature friendly solution?” and create an original Christmas decoration of nature friendly materials.

Related topics: St. Christmas traditions now and 100 years ago; the choices of Christmas decor and ways of decoration; the use of cut Christmas trees in the post-holiday period.

Students will develop the following competences:

- ability to search for information through various sources of information;
- ability to ask questions, to formulate them;
- ability to capture, to discuss, to select and purposefully use the received information;
- ability to communicate and collaborate;
- ability to develop the public language: to speak persuasively, to discuss, to rely on citations;
- ability to indicate the characteristics of materials and how certain substances affect the environment.

What is the goal of the task? (It is recommended the goal to be more focused on the result - the students will create, evaluate, analyze. WHAT?)

Based on various sources of information, students will prepare for the debate “Artificial Christmas tree – a nature friendly solution?” and will create an original Christmas decoration from nature friendly materials.

How will creative and / or critical activities develop pupils?

The project aims to develop pupils’ social, initiative and creativity competencies. The class community project initiates / promotes three key activities:

1. Students are encouraged to be interested in Lithuanian Christmas traditions / festive decor, to discover and compare how they have changed in 100 years. These activities use a survey method involving families, especially senior family members.
2. Students are encouraged to actively discuss about the decoration of Christmas trees, and its consequences using the method of debate. While collecting material from the analysis, students will realize that massive festive decorations (such as tree flowering) have a negative effect on the earth; they will also discuss which decorative materials have a negligible influence.
3. Pupils inspire new insights to create Christmas decorations from materials that are friendly to the earth. It is likely that after this project, in the future children will choose materials that are friendly to the earth. This will help them to understand the importance of ecology.

What are the teacher's expectations about the pupils (or what are the roles of students)?

Students who receive the assignment will discuss the holy Christmas traditions that are going on in their family, after asking their elderly family members, pupils will find out how long they have been existing. Working in the classroom, they will discuss and compare their own traditions with other pupils' families. Pupils will also find out which traditions have changed. Pupils will create a Double Bubble Mind Map.

Pupils will independently search for information for the debate on „Artificial Christmas tree - a nature friendly solution?“ During the debate, the pupils will rely on argumen rather than opinion.

By analyzing the material, pupils will choose which Christmas decorations are nature friendly and which are not.

Based on the information available, after consulting with family members, they will create an original Christmas decoration from nature friendly materials.

Briefly and creatively introduce their idea in class.

What is the role of the teacher in the task and presentation:

Learning resources. Talk with family members, shopping places for Christmas decorations, shopping place to buy a real Christmas tree, the Internet.

Thinking issues:

- When was the Christmas tree decorated in Lithuania for the first time? How did your grandparents and greatgrandparents decorate it?
- How does your family decorate your home during the Christmas season?
- Where and how can a Christmas tree be bought?
- Is decorating an artificial Christmas tree a sustainable environment?
- What to do with a live Christmas tree after the holidays?
- How many friends in your class want to decorate an artificial Christmas tree, and how much does it really cost?
- What is your dreams Christmas Tree? Why?
- What decorations are nature friendly?
- What decorations can we make from secondary materials?
- Which of the ideas have turned out to be the most original for you? Why?

How has your approach to Christmas decorations changed? Why?

- Tools and techniques for creative thinking and critical thinking – Double bubble Mind Map, debate method, creative work from nature friendly materials.
- Creative and critical thinking products / results – Two-dimensional bubble Mind Map, debates, Christmas decoration made of nature friendly materials.

Create "scaffolds". Information, encouraging to look for nature friendly solutions for Christmas tree decorations:

Artificial Christmas tree: Most artificial Christmas trees are imported from China and are made of neoprene materials (eg, plastic). But even choosing to buy this type of Christmas tree remains an opportunity to be an eco-friendly consumer. Although the plastic tree does not contribute to the conservation of nature, if you use it for many years, then you will surely compensate it for the production of used resources. Another "green" variation – choose a Christmas tree that is made from already recycled materials. Ask for such information from the seller, read the labels.

In Lithuania, people started to decorate Christmas trees only a little more than a hundred years ago. So it's a fairly new tradition, but incredibly well-worn. Sprinklers are the undisputed attribute of winter holidays.

Christmas trees are grown in specialized nursery gardens or they are cut, with prior agreement with the forester. The woods should not suffer from Christmas fever. However, in nursery gardens, Christmas trees are grown using chemical fertilizers and pesticides. Then the trees are transported by cars that emit gases and pollute the environment.

On the other hand, many artificial Christmas trees are produced in China from petroleum products, polyvinylchloride plastic, whose production is very bad for nature. Most of the artificial Christmas tree even contain lead! When they are eventually discarded, it will take many centuries to decay. In North America, even 70 percent of Christmas trees are artificial. In Lithuania artificial shoots become more stable every year.

Lovers of artificial Christmas trees say that these holiday decorations do not need to be transported every year, which reduces emissions from vehicles. Especially nature is protected if the same Christmas tree is used year after year, even from generation to generation.

Given all the factors, it is difficult to say which tree is more environmentally friendly. If you buy a real Christmas tree, buy from the nearest nursery garden. You can donate used, but still good looking artificial Christmas trees to charitable organizations, churches or children's shelter. But perhaps the easiest option would be to buy a live Christmas tree planted in a pot. It will grow and you will enjoy it for years or you can decorate a Christmas tree in outside.

A Christmas tree that has just been cut. Even though such an option does not help to preserve forests and the environment in general, but if you have decided to buy a real Christmas tree cut from the forest, do not forget that you will have to take care of it even after the holidays. It is even better to buy a Christmas tree that was grown on a special plantation. Because of such a tree cutting at least the forest did not suffer. Do not be lazy to take care after the Christmas tree after the festive season. One of the best ways is to use it for compost. The Christmas tree should be shredded and put into a comat, which will then be used as organic fertilizer. Another option – collecting Christmas trees free of charge after each Christmas in the cities of Lithuania. They are used in biofuel boiler houses. If your house is heated with firewood, maybe after shredding it will be possible to burn the Christmas tree too? It will be better for you at the same time to heat your home, rather than throwing it in the forest or landfill. Christmas tree with roots The most ecological option is to buy a Christmas tree with roots, and to plant it after using it. If you do not have a place where you can plant a Christmas tree after the holidays, maybe you can give it to someone who has this opportunity? Initiatives for tree planting are always welcome. When buying such a Christmas tree, do not forget to take care of it – do not place it close to the radiator or the fireplaces. Do not forget that this Christmas tree is alive, so you have to water it. Buy a Christmas tree and plant it in your garden or yard – so you will have a Christmas tree each year and you do not have to search every year for the place to buy. Upon approaching celebrations, you will have just to decorate it.

Spruce branch. If you do not have possibility to keep a real or artificial Christmas tree at home, one more option is left – it's a branch of a spruce or a pine tree. You can hang it anywhere on the wall, and if it's small – dip into the vase. It should not be difficult to get a branch – it's enough to look for wind broken branches in the woods or just talk to tree vendors – they usually have branches. Just before Christmas, the foresters usually give branches free of charge. You can also try to find other alternatives – if you have a fantasy and you want to make your Christmas different. You can make a Christmas tree yourself from the materials around you, while raising them for the second life. You can use woodcuts, paper, cans, bottles, and cutlery, knit or even sweets.

Creating an educational environment. How will the educational environment be developed?

- In what environment (traditional and non-traditional) will there be training for creative and critical tasks?
- Pupils will also learn in classical and non-traditional environments: in festive shopping (Christmas towns, markets, flower shops).
- What measures will be used in the physical environment, why? What learning resources, equipment, IT technologies will be used, why?
- Online resources will be used for visualization and disclosure. Looking for environmentally friendly materials to create the most original Christmas decorations.

Assessment (What will be proof that pupils and teachers are satisfied with the results?)

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

The assessment should take into account whether the pupils used several sources of information, or the ability to distinguish facts from the point of view.

When designing Christmas decorations, the idea of the choice of material for a friendly nature, or the original Christmas presentation is appreciated.

Criteria for self-assessment of activities

An individual assessment of each subject's material on this topic.

Assessment of team preparation for debate and debates already held.

Visitors vote for children's Christmas trees made from nature-friendly materials.

The originality of thoughts and technologies

Pupils will choose the most original Christmas decorations idea by voting. All made Christmas decorations will decorate the pupils' homes during the Christmas season, encouraging to of friendly nature solutions.

*Author: Vilma Gaubienė
Kaunas Panemunė primary School*

Topic: READING IS ENJOYABLE AND EASY.

Target audience: 9–10 years old, Grade 3. **Subjects:** Lithuanian language, Ethics.

Aims: reflect on your personal reading experience and create a Circle Mind Map “Reading is Enjoyable and Easy”.

Related Topics: reflection on reading. Reader’s character features and habits.

Students will develop the following competences:

- ability to develop higher reading goals;
- ability to reflect on your experience;
- interest in your personality;
- ability to communicate and collaborate;
- public speech skills, ability to present your reading ideas;
- creativity in presenting your experience.

What is the goal of the task? It is recommended to focus the goal on the result - pupils will create, evaluate, analyze. WHAT?

Based on the experience available and the questions received, the pupils will discuss the different reading experiences in the groups. The ideas discussed in the groups will be presented to the classmates. Your personal reading experience will originally portray the Circle Mind Map. The Mind Map will incorporate new exciting reading experiences and habits and will test them for the purpose to make reading enjoyable and easy.

How do creative and / or critical activities educate pupils?

The goal of this exercise is to develop pupils’ ability to reflect on their own experience and to incorporate new interesting experiences and habits into life. The task will improve the competence of creativity, interest in your and your friends’ personalities. The task will encourage children to achieve higher reading goals. During the task it is important to hear and diversify your reading experience with some interesting things. Pupils will create a picturesque tool that will allow them to keep in mind the goal of the reading „*Reading is Enjoyable and Easy*“. Pupils will understand the importance of reading habits in development of reading.

Teacher’s expectations (the role of the students)

After getting the question pupils in the groups will share their reading experience. Pupils will remember what they know about reading, why it is important to achieve higher reading goals. Pupils will find out what important character features a reader needs in order to achieve higher reading goals.

Create a Circle Mind Map „*Reading is Enjoyable and Easy*“. They will creatively portray their personal reading experience, expand it with new reading habits. The created Mind Map „*Reading is Enjoyable and Easy*“ will be hooked up at home in a visible place and pupils will try out the new reading habits in it.

What is the role of the teacher in the task and presentation?

The teacher divides the children into groups, distributes the questions for discussions. Questions for groups should be different. Later, the teacher organizes feedback of group discussions. Explains the structure of the Circle Mind Map and the criteria for evaluation and self-assessment.

Learning Sources. Chats and discussions on different children’s reading experience.

Questions to think:

When is reading enjoyable and easy?
Where is it enjoyable and easy to read?
Who is it enjoyable and easy to read with?
Why is it enjoyable and easy to read?
What is it enjoyable and easy to read?
How to read that it was enjoyable and easy?

Why is it important to reflect your reading experience?
Are there any differences in reading experiences between boys and girls?
What character features do you need to achieve higher reading goals?
Is it important to write down your reading goal and read it daily?
Why is it important to make reading easy and enjoyable?
If an adult person made such a circle Mind Map, would it be very differ from yours?

Tools and methods for creative and critical thinking:

Discussion about reading experiences and habits. Circle Mind Map.

Products / Results of Creative / Critical Thinking

Creating a Circle Mind Map "Reading is Pleasant and Easy".

Create scaffolding: information that encourages to become familiar with your, as reader's, habits and character features, and to raise your reading goals.

Creating an educational environment. How will the educational environment be prepared?

In what environment (traditional and non-traditional) will the training (s) take place in order to perform creative and critical tasks?

Pupils will learn in the school library and in the traditional environment in the classroom. Discussions will take place in the library. Creation of individual Maps of Thoughts will take place in the classroom.

What measures will be used in the physical environment, why? What learning resources, equipment, IT technologies will be used, why?

Library resources will be used for visualization and disclosure of problems. A Circle Mind Map will be used to portray the goal of reading and personal reading experience. Materials such as paper, glue, pens, etc. are used to create a Mind Map.

Evaluation (What will be the evidence that pupils and teachers are satisfied with the results?)

Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

The assessment should take into account whether the pupil was actively involved in the group discussion on reading experience or presented the group's ideas. The creative design of the Mind Map is evaluated, or the map has been supplemented with new reading habits. It is important that the created Mind Map becomes a tool that hangs at the pupil's home and helps to continually seek reading and improve reading habits.

Criteria for self-assessment of activities

Individual self-assessment of the Circle Mind Map developed by each student.
Creating new exciting reading habits.

The role of the family in this task could be:

- Discussion and suspension of a pupil's Circle Mind Map in a visible place.
- Continuously to discuss new reading habits at home and their impact on reading skills.

Conclusions – Teacher Reflection.

TEACHING METHODOLOGY FOR TEACHERS AND PARENTS

Tasks for 10–14 years old pupils

Topic: INVESTIGATING THE ANCIENT WORLD

Target audience: students of all ages, preferably 10–11 years old students. **Subjects:** various subjects, a task encourages critical thinking.

Aims (recommended goal-oriented result - students will create, evaluate, analyze ... WHAT?): The task is given individually, it encourages learners to think creatively, analyse the data and arrive at the conclusion. Students will find out the new information and will gain new learning outcomes.

Students will develop the following competencies:

- Research, problem solving skills: how do the students use or create research models to achieve conclusions or problem solving?
- Critical evaluation skills based on arguments.
- Working in pairs and /or a group.
- Systematizing information.

How will the creative and critical activity develop the students':

Students will be able to analyse, interpret and synthesise evidence coming from different types of sources.

Teacher's expectations (the role of the students)

Students will study ONE of the individuals and will investigate, applying requisite historical skills. Students investigate the past through an examination of issues relevant to the nature of the evidence including the ethical practice, ownership and representation of the ancient world.

Teacher's expectations (the role of students)

The work will be in the form of presentations and discussions. The teacher will pay attention to the ideas presented during the discussion while sharing information. At the same time, the teacher will pay attention to the student's ability to access research and information.

- Students independently analyse information sources, questions in accordance to the work plan. Students collect information from different sources and analyse, organize and make conclusions.
- Students will learn to process information: to explain, compare/contrast, classify, interpret, analyze and make conclusions.
- Students will be able to ask themselves questions and/or use the questions provided by the teacher.

HOT (higher order thinking task) Questions:

- What could be used during the assignments?
- What has helped in achieving the results?
- What needs to be improved?

Creation of a learning environment. How will the educational environment be achieved?

- Tasks are carried out in lessons, classroom hours or various extra-curricular activities.
- IT technologies, e-libraries and traditional libraries will be used.

Performance evaluation criteria. Criteria for the assessment of learning outcomes/products.

- Ability to express ideas.
- Research skills.
- Group work skills.
- The ability to reach the conclusion.
- Generate different ideas.

Topic

Help and guide students.

Encourage students to cooperate.

Highlight the important points of the discussion.

Topic: UNRELATED RELATIONS

Target audience: 10–11 year olds. **Subjects:** English.

Integration: depending on the lesson or educational activity to be performed: foreign languages (activities are then conducted in a foreign language as a foreign language, engaging in enriching vocabulary), IT.

Students will develop the following competencies:

- ability to apply learned vocabulary;
- research skills;
- independent thinking, originality;
- ability to communicate, raise questions, gather information;
- research competences;
- ability to plan and reflect on the learning process and outcomes.

Teacher's expectations (the role of the students)

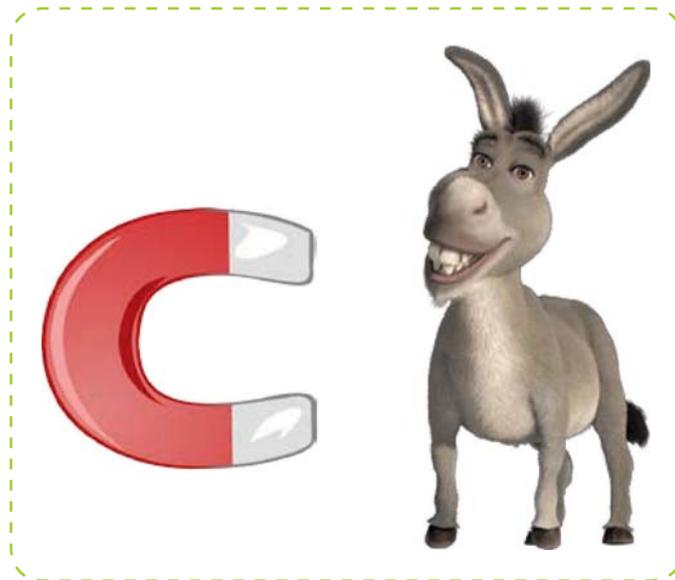
The group of pupils is divided into smaller groups of 5-6 pupils. They are given two items: for example, a few pieces of cherry and cake, a candy and a portion of ice cream. Non-edible items may also be provided, eg. ruler and punch, etc.

First, students are asked to describe things in two sentences. For example, cherry is red. Cherries are berries. Cake is a pastry. It can have different flavors.

Then, after a certain time, for example, 10 minutes, students are given the task of finding at least three links between these things, how they could be linked. Ex. the cherry can be used to decorate the cake.

At the end of time, each group presents their results. Can be performed either in realistic or narrative. The team that comes up with as many links as possible between two things wins.

Visualization



Higher order of thinking stimulating questions

Is it always the only answer that is directly visible?

How did you find links between things? What thinking strategies have been used?

What was most surprising?

Will I be able to use the connection I find in everyday life? Where?

Attractiveness

This is an attractive task for pupils as it encourages them to think creatively, to accomplish their task in their world of cognition and using ICT skills. If the task is to be performed individually, it will encourage the pupils to concentrate, awaken in themselves, and be able to think creatively, while combining creativity with practical application, trying to look deeper into things or phenomena. If the task is to make groups of pupils, encourage collaboration, listen to another's opinion, be able to express one's own understanding, develop leadership qualities.

Collaboration

Collaboration, working in pairs, helping a friend, leadership.

Reflection

How did the task work? What succeeded / failed?

What did you find out after completing the task?

What was the most difficult in the task? Why?

Was it easy to collect information?

What Grade will you write yourself? Why?

What should be improved?

What would you do differently?

Evaluation criteria of creative thinking tasks

Foreign language lessons:

Language coherence, fluency, regularity in delivering discovered interfaces.

Correct use of foreign language

Proper use of foreign language words.

Using daily foreign language phrases.

In other lessons or activities:

Ability to adopt the right strategy, to allocate roles in the team, to take the leadership.

Topic: BEST FRIEND

Target audience: 10–11 years old. **Subjects:** Native language, Ethics, Knowledge of the world.

Aims: Students will develop the following competencies:

- analyse the received material, collected data and networks;
- ask questions and answer on the basis of the information and describe the structure of an object;
- critically evaluate their characteristics;
- work pair;
- deliver illustration of their work.

To achieve the desired results a variety of methods will contribute.

- Brain storm (what is a best friend).
- Mind Map (bubble). The scheme, children can draw themselves or the teacher may give the prepared template. Students work individually and fill out the map. Then, in pairs, they discuss it.

Name _____

Bubble Map Graphic Organizer

```
graph TD; C(( )) --- U(( )); C --- D(( )); C --- L(( )); C --- R(( )); C --- B(( )); C --- T(( ))
```

- PAA method: praise, advise, ask a question (students attend class in a friend's Teacher's expectations (the role of the students), comments on this is what I heard (praises, mentor and asks what for them was not clear).
- Venn's diagram (comparison of the results of the thoughts of the maps).
- The generation of questions (ask 5 questions to your friend).
- Analysis and systemizing of collected data (preparing to Teacher's expectations (the role of the students) in writing).
- The description.

What are the teacher's expectations for students?

- Students will work individually, in pairs (maps, questions).
- Students will be able to process information (explain why they thought like this, compare, interpret, analyse the results, conclude).
- Students will be able to use thinking tools (maps, PAA method).
- Students will be able to apply information (generalize, imagine, assess, evaluate, illustrate).
- Reflection: (Students need to answer the following questions):
 1. What have I learned, what have I done?
 2. What was the matter? Why?
 3. What was the benefit?
 4. What has helped to perform well?
 5. What was the most successful?
 6. What were the difficulties encountered?
 7. Was the activity useful?
 8. What did I expect from a presentation?

Develop learning products/results (the presentation of their descriptions for classmates, illustrations. Then everything will be bound in a book "*My best friend*". Later (selected evening) in the classroom, will be the presentation of the book the relatives of the pupils).

What is The role of the teacher in the task and presentation?

- Critical thinking promoting questions:
 - What are friends like? Why do you think so?
 - What, in your opinion, is the most important characteristic of the best friend? Why?
 - What would happen if people didn't have best friends?
 - If you went with a friend to an uninhabited island, what would you do?
 - Do you think you are a good friend?
 - Why do others want to be friends with you?
 - How don't we behave with our best friend? Why?
 - What do you call a really strong friendship?
- Creative and critical thinking tools and methods:
 - the Mind Map "bubble";
 - Venn diagram;
 - brain storm;
 - PAA method;
 - presentation;
- Creative and critical thinking, products/results:
 - Developed the best friend's description;
 - Illustration;
 - The book's "*MY best friend*" presentation.

“Scaffolds”.

Friendship is a connection that fosters the openness of communication, sincerity, based on mutual trust, respect for the other person’s opinion, needs and freedom, and tolerance.

Friendship in some sense without hesitation caring for someone. Definitely mutual! Not enough to share the only good emotions, celebrate the holidays while on vacation or discuss daily events.

A true friendship-relationship, checked all the moments of life, together wiped off tear, tip, specific aid support.

Friendship takes time. Friendship should constantly nurture, strengthen, cherished.

Rules as to be a good friend:

A good friend is honest. A good friend doesn’t talk about every event in his life, but they will be open to you. They will show you the “real face” and in good faith to you. When something looks wrong to them, they’ll tell you about it.

A good friend is a fun, unique and interesting. With some friends, fun, because they are a “convivial”, with other fun, because they observe every slightest detail, strange situation. With some people is fun just because they look at life differently than everyone else. If you are interested in this, what does the other person, if you are interested and you want something to learn, if the activity that leads from the mind of your friend, you are also acceptable-then you are sure to find a common language for quite a long time.

A good friend is considerate and learning to adapt. A good friend is a good listener and note how small the daily things you work. A good friend can’t read your thoughts, but can usually find when you are happy/sad, excited, shocked or melancholic. If he knows that doing something that bothers you, as if trying to stop making or at least endeavour to reach agreement with you, you really have to call him/her best friend.

A good friend always will support you and your goals. A really good friend knows how you live and will help you become a person you want to be. He / she will not try to change or put you in situations where you feel uncomfortable, he / she will not take you to risk something that is very important to you.

A good friend is the one that you can trust. A good friend will not try to mimic you. He / she is not tired of you. He / she will tell you when he / she will be worried about you, and will try to be near you when you are in trouble.

A good friend will tell you that he cares about. Different people in different ways show that you care about them. One can show it by hugging you, the other one can not fail to mock. The fact that he / she is often chatting with you that you want to know what is happening in your life and is interested in you shows that you care about him / her.

A good friend will not leave you in joy or misery. Fidelity is a property that almost every person identifies as the main attribute of a good friend. When you are not lucky, a faithful friend will be with you. If you resign or change the school, he / she will try to stay in touch with you.

A good friend accepts you as you are. When you get married, your ability to take you as you are, goes hand in hand with loyalty. A real friend, as you grow up, goes up with you and knows how to react to your excitement and dogness. He / she is also patient if you are wrong. Even when you make big mistakes, he / she learns to forgive you when you hit him / her. In other words, he / she behaves with you the way you would like to be treated with you, even when you’re acting abusively.

Creating a civic environment. How will the educational environment be developed?

- Activities take place at school, in the classroom.
- Tools used: various pictures (illustrating friends), paper sheets for thought maps, essays, illustrations.
- Smart board used to show slide shows.

Select the teacher's assessment.

- Originality (peculiar, unprocessed, unique, authentic, unpredictable product or solution not analogous).
- Smoothness (a feature of the abundance of ideas, novelty).
- Tolerance (tolerance for ambiguity, uncertainty, ability to understand more than myself).
- Imagination, fantasy (creation of new images, visualization of an activity or result prior to its final performance).
- Sincerely and empathetic listening (allocating your mental energy to other ideas and thoughts, understanding others' attitudes and feelings).
- Raising questions and understanding problems (problems that need to be addressed in the search).
- Thinking together (ability to work and learn with others in a team).

Clear and precise thinking and communication (clear communication in oral and written form, avoiding generalizations, distortions, inaccuracies).

Topic: THE SOLAR SYSTEM

Target audience: 10–11 years old. **Subjects:** Knowledge of the world, IT.

Aims: the aim is to enable students to:

- analyze the material obtained;
- to formulate a network and a concrete answer to the question;
- systematize information;
- work in a group;
- to present their job.

Different methods can help achieve the desired results:

- brain storm (what you know about the planet and the solar system).
- Mind map (a tree). The scheme has to be painted and filled up by the children themselves.
- the game („What planet do I tell?“).
- analysis and systematization of collected data (poster creation).

Teacher’s expectations (the role of the students)

- Students will be able to work in groups (play, create a poster).
- Will be able to process information (interpret, analyze, draw conclusions).
- Will use the thinking tools (mind map, game).
- Apply information (evaluate, generalize, imagine, illustrate).
- Reflect. Students need to answer the following questions:
 9. What did I learn?
 10. What was important? Why?
 11. What was useful?
 12. What did you do well?
 13. What am I most happy about?
 14. What difficulties have you encountered?
 15. Has the activity been beneficial?
- Create learning products / outputs (create posters on a planet that will go along the way, present your spells and organize a poster exhibition).

What is the role of the teacher in the task and presentation?

- *Thinking Issues:*
 1. What happens if the Earth turns up?
 2. How do you think it would be otherwise if there was no Sun?
 3. Why do we call the “Solar System” and not, for example, the “Moon System“?
 4. How long do we travel from the Earth to the Sun? Why?
 5. Would a beautiful necklace be received from the planets if we could be thrown out of heaven?
 6. Why is Mars so small?
 7. Where did the water come from?
 8. How do you think the planet is growing?
- *Creative and critical thinking tools and methods:*
 1. Mind map “tree“;
 2. brain storm;
 3. game;

4. illustration;
 5. presentation.
- *Creative and critical thinking, products/results:*
 1. Fill in the Mind Map.
 2. Planet poster created;
 3. Presentation of work.

“Scaffolding”

The movie show (<https://www.youtube.com/watch?v=Qd6nLM2QIWw>).

The game.

Student groups are compiled after 8. Extraction of one card. The pupils will agree who will start the game. The student who started the game reads only the description of the planet (it does not mention the header because it does not match the content). A student with a card with a planet that has just been called by his classmate, says, „I have ...“. But some, but not all, descriptions are flawed. It should be mentioned before reading your card information. Hears and answers his own and so on.

<p>EARTH The planet closest to the Sun. She circled around the Sun in 88 Earth days. Its surface is similar to the surface of the moon—all the circles of varying sizes are set. At sunset it burns up to 430 degrees at midday. Many films have been created on this planet. (Mercury)</p>	<p>URANIUM The only planet with water, besides being covered by a gas shell - an atmosphere that contains oxygen. It allows you to survive. It brightens all other lights. (Earth)</p>
<p>JUPITER Blue planet It has a good cold. Strikes (1000 km/h) winds. The nearest planet to Earth. (Neptune)</p>	<p>MERCURY The largest solar system planet. It consists of layers of gas. This planet takes about 10 Earth hours, and the year is more than 10 times the Earth's year. The planet Earth is the next. (Jupiter)</p>
<p>VENUS The planet is also called Red. Her poles are covered with ice caps. It is believed that there were rivers on the planet, i.e. water. (Mars)</p>	<p>SATURN On the Sun, this planet rotates very slowly - one of its days lasts 243 Earth days. It is extremely hot because the planet is covered with clouds of volatile acids. (Venus)</p>
<p>NEPTUNE This planet is a huge gas ball. She has bright rings. Around dozens of pilots ride around it. (Saturn)</p>	<p>MARS The planet has many thin, dark rings. She is „lying on the side“, which is why she is called „irregular“ planet. (Uranus)</p>

The project.

Class students are divided into two groups. Then they pull the path of what kind of planet they deliver (rock or gas).

After that, each group divides into four groups. They agree with each other (or find out by lot) which group on which planet the poster will deliver.

When done, posters are presented and arranged for their exhibition.

Creating a civic environment. How will the educational environment be developed?

- Activities take place at school, in the classroom.
- Tools used: various photos (representing the planet), paper maps for thought cards, posters, video material (<https://www.youtube.com/watch?v=Qd6nLM2QIww>).
- Smart board used, slideshow, video material.

Select the teacher's assessment.

- Originality (peculiar, unprocessed, unique, authentic, unpredictable product or solution not analogous).
- Smooth (a feature of the abundance of ideas, novelty).
- Tolerance (tolerance for ambiguity, uncertainty, ability to understand more than myself).
- Imagination, fantasy (creation of new images, visualization of an activity or result prior to its final performance).
- Sincerely and empathetic listening (allocating your mental energy to other ideas and thoughts, understanding others' attitudes and feelings).
- Raising questions and understanding problems (problems that need to be addressed in the search).
- Thinking together (ability to work and learn with others in a team).
- Clear and precise thinking and communication (clear communication in oral and written form, avoiding generalizations, distortions, inaccuracies).

Tip for parents: visit the planetarium.

*Author: Diana Kairiūkštienė
Kaunas Panemunė primary school*

Topic: MY DUTIES AND RIGHTS

Target audience: 10–14 years old, Grades 4–7. **Subjects:** English and Education lessons.

Aims: to develop pupils' creative thinking skills, improve learning skills, raise awareness and independent judgments using an hourly mosaic method that makes students use internal creative resources.

Teacher's expectations (the role of the students)

- students structure information and create new forms of presenting information;
- criticize allegations based on arguments;
- practice thinking abilities (thinking processes), teaching thinking as a basic skill;
- form ability to structure information and learn new presentation skills;
- critically analyze activities;
- critically evaluate allegations based on arguments;
- demonstrate teaching and learning processes used to develop certain skills in thinking, behavior, co-operation and individual actions;
- provide feedback (AS) on the result to be achieved (SR);
- work in pairs and groups.

Teacher's expectations (the role of the students)

- students structure information and create new forms of presenting information;
- criticizes allegations based on arguments;
- learn together, compare and create ready-made examples of innovative products and interesting solutions;
- demonstrates teaching and learning processes used to develop certain skills in thinking, behavior, co-operation and individual action;
- provide feedback (AS) on the result to be achieved (SR).

The role of the teacher in the task and presentation:

- the mosaic method requires pupils to use internal creative resources;
- develop critical thinking skills;
- students learn together, compare, create ready-made examples of innovative products and interesting solutions;
- interpret, analyze, draw conclusions, set sequences, synthesize;
- students ask each other questions and answer the teacher's questions.

Students' role

- take responsibility for their learning;
- ask questions to each other (metacognition) and answer the teacher's questions;
- create and present various training products: interviews, etc.;
- develop social skills such as co-operation, communication, etc.;
- work in pairs or groups (3–4);
- use different thinking tools (think patterns, problem solving models, etc.);
- use different thinking tools using internal thinking resources;
- provide Feedback (AS) – which help to achieve the result (SR), understand why it could be used next time, why and what needs to be improved, what is good, what's less successful, what will happen next time in other situations.

What is the role of the teacher in the task and presentation?

- the teacher must understand that the learner's learning process is more important than the result;
- includes personal responsibility for the perfect choice;
- raise pupils' knowledge with different information;
- the teacher must anticipate the consequences of their own decisions;
- the development of a dialogue culture allows for joint activities.

Creation of a learning environment. How will the educational environment be achieved?

- in the classroom, a traditional learning environment;
- encouraging students and learners cognition, encouraging new discoveries and risks in the learning process;
- building faith for one's own strength and self-control;
- selection and analysis of information.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

All the students and the teacher participate in the assessment in English.

Criterion explanation	Explanation	Complete	Partial
Information processing	I can compare, inform, evaluate internal resource information		
Communication	I share knowledge, use various communication tools, actively participate in discussions		
Content creation	I can use and combine different information		
Conclusions	Clear conclusions have been drawn at the end of the work		
Language usage	In English class (vocabulary, discussion). The teacher also evaluates students.		

NOTE. If the student works in a group (or a pair), all members of the group (pair) receive the same rating.

Short conclusion. Teacher's reflection.

Using the mosaic method, students used internal creative resources; they took responsibility for their learning, developed their thinking skills, and critically evaluated allegations based on arguments. Students learned together, compared and created ready-made examples of interesting solutions.

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*Author: Sarmite Katkevica
Education and Information Services of Riga City (RIIMC), Riga, Latvia*

Topic: INSERTING IMAGES INTO A TEXT DOCUMENT. TEXT AND GREETING DESIGN

Target audience: 11 years old, Grade 4. **Subjects:** IT, Languages, Social Science, Class Lesson.

Aims: to be able to find the necessary information on the Internet, to develop thinking processes that include obtaining information, processing information and decision making how to express one's own attitude towards accomplishment.

Pupils will develop the following Students will develop the following competences:

- find and select existing, pre-existing experiences and information needed to create new experiences;
- analyse events, actions, issues etc.;
- structure information and draw conclusions;
- develop skills in decision-making and / or develop proposals for solving the problem;
- work in pairs;
- learn how to insert images into a document;
- learn how to change the position of a text and image;
- develop skills of formatting text and pictures.

How will creative and critical thinking stimulating activities develop students?

Students:

- will be able to formulate the goal of the lesson and the results to be achieved;
- develop their information retrieval and processing skills, reading skills, literacy skills, ability to talk and listen;
- will work with information in the Word document;
- will work in pairs and independently;
- learn to choose images according to the content of the text;
- develop the ability to place images in the text and to design them according to the terms of the order;
- visualize the information in the presentation and transfer it to life's experience;
- will be able to provide feedback on the achievements in an hour.

Teacher's expectations

Pupils will work in pairs and individually, will be purposeful performers and participants in lessons, where they will be encouraged to share their personal experiences and thoughts to promote critical thinking processes.

The Critical Thinking Method "Quadruple Microscope" will be used in an hour in a simplified and Grade 4 way. The method focuses on attitudes and roles that contribute to solving the problem and ensures that the participants in the discussion do not compete each other but think in a similar direction.

Up to 24–30 participants can take part. The time required to apply the method can be 10–15 minutes.

Before the discussion begins, the pairs of participants are introduced to the essence and meaning of the method. Discussion in pairs on the question / task raised. If at some point the teacher feels that a pairwork should be supported, they do so.

The role of students

- *Working with a worksheet.*
Students are offered a worksheet for working in pairs (based on the topic of the lesson). Pupils work with the tasks of the page in way how to get a joint result and get information from each other. The question and answer model in pairs is used for completing work.
- *Work in pairs.*
Pupils will be able to work in pairs (pairwork helps to develop speech skills in mother tongue classes at primary school).
- *To work with the aim to complete the assigned tasks.*
Students independently analyse the information and sources of information at their disposal, considering the issues, objects, phenomena, etc. following the work plan.
- *Work independently, collect information, analyse, structure, summarize, draw conclusions and answer questions.*

Teacher (or pupils) ask questions orally about a specific topic and pupils answer questions.

- *Solving problems with learning outcomes.*
The teacher or pupils formulate the problem or question to which the answer should be found. Pupils clarify the problem, develop a plan for solving it, implement it, evaluate the result and find out whether it is a solution to the problem and whether the problem can be solved otherwise.
- *Analysis of the situation.*
Usually, real situations (events) that pupils can associate with their experience are used for the analysis. Events for situation analysis can be displayed in text, drawings, photos, video clips or audio recordings. Pupils listen, read or watch the material, get a specific job assignment (for example, find the cause of the situation, predict the course of events, choose a suitable solution), pair their conjecture, possible options, etc., discuss and evaluate them, make a joint decision on the most appropriate, the most appropriate solution and the end result is reported to the teacher.
- *Exercises.*
The teacher offers students some similar tasks to strengthen some specific knowledge or skills. Pupils repeatedly carry out homogeneous activities that help automate the use of knowledge or skills, acquire or develop physical or mental qualities, abilities.
- *Creating a new product.*
Based on previous experience, new knowledge and skills, pupils create their own digital greetings. They can also create digital invitations.
- Pupils will learn how to process information: explain, compare / contrast, classify, interpret, analyse, draw conclusions, set sequences, synthesize, search information, etc.
- Pupils will create a paired text document by inserting images related to the content of the text.
- Pupils will make a birthday greeting on their own, choosing pictures and text independently of the greeting conditions.
- Pupils will practise inserting a picture into the document.
- Pupils will learn how to change the size and position of the image relative to the text.
- Pupils will know the level of the picture, which is the font, size, bold, italics, underline, and alignment.

The role of the teacher in the task and presentation:

The teacher has offered tasks by giving content and tools about how each task affects the pupil's thinking, what level of thinking skills are created with specific tasks. Thinking is visualized and / or discussed.

- Sources of learning: a student worksheet, a presentation about inserting of the images and changing the size and position of the image relative to the text.
- Questions that stimulate thinking:

HOTS (higher order thinking task) questions for the beginning of lessons to understand how students understood the topic of the lesson:

What do you mean by inserting images into a text document? What could it be? Who has done it? How do I insert an image into a text document? What is the hardest thing to do? How can this be done in a different way? How is it easier and why? What concepts do you know or see in a presentation that you should remember how to properly insert an image? Why do I need to add text to my text? Which technique do you use? What conclusions can you draw? What can I do if I can insert pictures into text? Why do we need congratulations? What does the greeting look like? What's in it?

Creation of a learning environment. How will the educational environment be created?

- *In what environment (traditional and non-traditional) will learning take place to complete creative and critical thinking tasks?*

Work can be done in a computer room equipped with computers. Pupils arrange their work and prepare for it. Pupils receive a worksheet with the terms of the method "Quadruple Microscope", where four windows are provided for filling in. Pupils together with the teacher read the terms of the method regarding the lesson's assignment and work with the teacher. Before the task, the teacher indicates that the students can draw or write in each of four windows in the worksheets. First, every pair of students have 5 minutes to work together and fill in the first method window "Associations", then 15 minutes the teacher works frontal, asking HOT questions and the students answer and at the same time the teacher responds and manages the work, reflecting on the presentation with the study material. Then, 5 minutes are allotted to fill in the second method window "Concepts" that the teacher helps to find in the study material – presentation. Dynamic break – 2 minutes. Completion of the 3rd method window "Visualization" – 3 minutes, then 10 minutes of work in practice on computer. The teacher observes the work and demonstrates the presentation as needed. The next step of 10 minutes continues with the completion of the fourth method window of "The Knowledge" with oral feedback from the teacher, following the HOT Questions and Answers. Then, the pupils make up their own greetings (15–30 minutes each). While one student is running on the computer, the other pair's participant follows the first participant's independent work and, if necessary, helps with advice or demonstration. Peer teaching helps to learn best.

The job is for one lesson (2 lessons) during which one or two rest breaks can be scheduled. They may be related to the content of the work.

- *What tools will be used in the physical environment, why?*

Worksheets are used, which the teacher can use without additional search material, the cancellery, 12–15 computer workstations for working in pairs, 24–30 work places for pupils.

- *What learning sources, equipment, IT technologies will be used, why?*

Screen and projector for visualization and presentation of worksheets for frontal work, computers with MS Office software.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

The evidence will be the results of the lesson – a filled-in worksheet and greetings, as well as feedback from the pupils, which will result in each pupil receiving each of their new experiences, building on the experience of their own and their peers.

Criteria for assessing activity. Criteria for assessing learning outcomes (products).

Teacher-selected assessment and self-assessment tools will be 2:

- feedback provided by the pupils within one hour at the end of the lesson and the greetings created;
- worksheets filled in pairs in accordance with the Quadruple Microscope method.

Short conclusion. Teacher's reflection.

Pupils compare what their feelings were at the beginning of the lesson and are at the end of the lesson. During the work they use a critical thinking method "Four windows microscope" or "Quadruple Microscope" in practice. The only result of work (the greeting cards) can be assessed. The teacher observes whether all the students have understood the aim of the lesson, the tasks of the lesson.

Critical thinking method "Four windows microscope" or "Quadruple Microscope"	Association Here are the first associations that come to mind when you hear the title of the topic you are learning. Sometimes this window is completed before reading a text.	Concepts Here are all the concepts that can be found in the learning material. It is recommended to add these entries by working in pairs or groups. If necessary, an explanation of the concepts is also recorded here.
	Visualization It is not advisable to draw an illustration, but to create a reflection of the nature of the topic in symbols.	Quotes You could also write the conclusion.

Tips for Parents

1. Engage in the development of child's critical thinking skills with a positive attitude.
2. Allow your child at home to use the Microsoft Word application for creating greeting or invitation cards.
3. Help the child find the most convenient way to insert and format images in order to create a greeting or invitation cards for family events.
4. Ensure that the child looks for information in reliable sources.
5. Identify the amount of opinions, options, and techniques before deciding and making a new product.

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*Author: Sandra Graudina
Education and Information Services of Riga City (RIIMC), Riga, Latvia*

Topic: DIFFERENCES BETWEEN INDIVIDUALS AND SOCIETY

Target audience: 11–12 years old students (students of all age groups). **Subjects:** various subjects.

Aims: The task is given individually, it encourages learners to think creatively, analyse the data and arrive at the conclusion. Students will find out the new information and will gain new learning skills.

Pupils will develop the following Students will develop the following competences:

- the student will be able to produce the right solutions and make the right decisions in their own life;
- the student will be someone who can create their own thoughts and question and evaluate others;
- critical thinking skills will help them become empathetic, controversial and compassionate individuals;
- the student will be able critically evaluate statements backed-up by arguments.

Teacher's expectations (the role of the students)

The work will be based on a group discussion method. Discussion is a teaching method in which two and / or many people examine any topic by speaking, listening, criticizing and asking questions when necessary. Students will research in advance the differences and similarities within a group and the whole class and will discuss it with their groups.

The role of the teacher in the task and presentation:

In the case of the teacher who manages the debate, it can be said that the duty and responsibilities of the teacher are difficult at a certain level. Because this method requires more time to spend. There may be noise in the class, the topic may be dispersed, some students may not want to participate, and class management problems may arise. However, if it is necessary for effective learning the teacher will guide the students.

- The students will be able to work in pairs, groups (different groups will be created and the discussion method will be used).
- Independently analyse information sources, questions in accordance to the work plan. Students will collect information from different sources and analyse, organize and make conclusions.
- Students will be able to ask themselves questions. Students will be in charge of their learning by asking questions.
- Teachers who are expected to support the development of critical thinking in the pupils should be open to different forms of information and thinking, can think critically and thus model their students in this way. Students will choose and create different learning results in order to showcase newly acquired skills.

Creation of a learning environment. How will the educational environment be achieved?

- In an unconventional environment, teaching / learning will be undertaken to carry out creative and critical tasks.
- Tasks are carried out during lessons, during classroom hours, during various extra-curricular activities.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

- Ability to express ideas
- Persuasion skills
- Research skills
- Respect for the different thoughts of others
- Group work skills
- Communication skills
- The ability to reach the conclusion
- Different ideas

Short conclusion. Teacher's reflection.

- Help and guide students.
- Encourage students to cooperate.
- Highlight the important points of the discussion.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: INDEPENDENT CREATIVE PROJECT WORK

“GENEOLOGICAL JOB TREE”

Target audience: 11–12 years old, Grade 6. **Subjects:** English.

Integration: Entrepreneurship education, ICT, art, technology.

Aims: Pupils will create a genealogical tree of family members’ professions, write to their family members (grandparents, grandmothers, aunts, uncles, etc.), or otherwise ‘attach’ the profession they have acquired. They will present this created project to classmates.

The teacher will prepare questions to develop critical thinking:

How have family members’ jobs changed over time?

What could have affected the disappearance of some professions or the emergence of others?

How to collect information from family members?

What professions can be described as endangered?

What was most surprising?

What did I learn about the professions of different times? What was unexpected / usual?

Students will develop the following Students will develop the following competences:

- ability to analyze objects, phenomena, events, actions, problems etc.;
- systematize information and create new forms of information provision;
- research and presentation skills;
- critically evaluate statements based on arguments;
- skills in decision-making and / or proposing solutions to problems;
- self-regulation skills of pupils (individual models of pupils’ thinking in solving the given tasks, questions, etc.);
- independent work and responsibility for proper performance.

This task will develop both individual and collaborative skills

Collaboration will take place during the preparatory phase of collecting data on the occupations of the family members, activities, talking to people, helping them to get involved in project models in order to gather the widest and most accurate information.

Teacher’s expectations:

- *Students will be able to*
 - perform the task individually, apply time management skills;
 - collaborate with information providers (relatives) purposefully to obtain the information they need;
 - independently analyze the information sources, questions, objects, phenomena according to the work plan;
 - will work independently, collect information, analyze, systematise, summarize and draw conclusions, conduct interviews from different addressees (relatives);
 - will be able to process the information: to interpret, compare / contrast, classify, interpret, analyze, draw conclusions, and put sequences;
 - will be able to ask questions and use the questions asked by the teacher;
 - use thinking tools (self-asked questions, thinking patterns, research or conclusion models);

- apply information – evaluate, generalize, imagine, evaluate, predict, predict
- reflect.
- *Questions for reflection:*
 - How did the task work? What succeeded / failed?
 - What did you find out after completing the task?
 - What was the most difficult task for the task? Why?
 - Was it easy to collect information?
 - What Grade will you write yourself? Why?
 - What should be improved?
 - What would you do differently?

The role of the teacher in the task and presentation:

The teacher focuses on a student centered learning, deliberately presents the task to convey the content, thinking how each task affects the pupils' thinking, the level of thinking skills that certain tasks develops. Thinking is visualized.

Thinking questions

- How has family members' work changed over time?
- What could have affected the disappearance of one profession or the emergence of others?
- How to collect information from family members?
- What professions can be described as endangered?
- What was most surprising?

What did I learn about the professions of different times? What was unexpected / usual

Creating an educational environment. How will the educational environment be achieved?

In the preparatory phase (collecting information on relatives' professions), learning will take place in non-traditional settings. Once the information is gathered, the creative project will be designed at home and at school, free from lessons. The final result – a presentation of the work, will take place during the lesson in a traditional classroom.

Evaluation

Created an original genetic tree of professions, creatively presented discoveries and insights which will serve as the main aspect for evaluation.

The competences listed above, which will be developed during the engagement.

The criteria by which they will be assessed.

*Author: Asta Macežinskiene
Kaunas st. Kazimieras progymnasium*

Topic: SOUP FOR DESSERT

Target audience: age group 11–12, Grade 5- 6. **Subjects:** cross-curricular task within health and care subjects, could be used in Mother tongue or a Foreign language lessons for advanced pupils

Aims: students will develop the following competencies:

- ability to apply the learned vocabulary (food words, meals, fruit and vegetables);
- research skills;
- independent thinking, creativity;
- ability to communicate, make questions, collect information;
- research activities.

Ability to plan and reflect on learning process and results.

How will the creative and critical activity develop the students?

Pupils have to create a recipe for the original soup, which can be had for dessert. In order to achieve this, the pupils will do preparatory work for the smooth running of the process. The teacher proposes to do a brainstorming activity *“What kind of soup I would like to have for dessert”*. The teacher or an elected student writes down the students’ statements.

The second stage is the *“Mind Map”* with the topic *“Soup”*.

The third stage is creation of a recipe using a variety of techniques, e.g. ICT.

The fourth stage is presentation of the recipe.

The fifth is voting and electing of the best recipe. This recipe can be used to make dishes during different workshops and technology lessons as well.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using their mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Teacher’s expectations (the role of the students)

Students brainstorm and make a mind map to activate prior knowledge. Working on this topic further they will use their critical thinking habits in order to answer the questions:

- What products are suitable for dessert dishes?
- Are soup ingredients seasonal? What is typical for winter, what’s for summer?
- Have their eating habits changed in this year? How? Why?
- What products are now on the wave?
- What was most surprising when creating the recipe? What was unexpected / usual?

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task’s educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms). Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a lecture/speech can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

Teacher

Ongoing evaluation: ongoing feedback and support.

Formal final evaluation (presentation/lecture): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the presentation.

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

Students

Self-evaluation: what I have learnt, will it have influence on my life, how I worked, what I can do it better next time.

Teacher and students

Evaluation of the group work.

*Author: Asta Macežinskiene
Kaunas st. Kazimieras progymnasium*

Topic: UNEXPECTED DISCOVERIES

Target audience: 11–12 years old, Grades 5–6. **Subjects:** English.

Aims: to promote pupils' creativity and critical thinking skills in finding ways to use other unusual things.

Integration: Depending on the lesson or educational activity to be performed: foreign languages (activities are then conducted in a foreign language as a foreign language, engaging in enriching vocabulary), IT.

Students will develop the following competencies:

- ability to apply learned vocabulary;
- research skills;
- independent thinking, originality;
- ability to communicate, raise questions, gather information;
- research competences;
- ability to plan and reflect on the learning process and outcomes.

The teacher will prepare questions to develop critical thinking:

Is the usual purpose of the item always the only one?

How have new, unusual uses of the object been discovered? What thinking strategies have been used?

What was most surprising?

Will you be able to use the new "discoveries" in everyday life? Where?

Exercise will develop the following competencies:

- pupils' ability to analyze – objects, phenomena, events, actions and problems;
- research and presentation skills;
- critically evaluate statements based on arguments;
- self-regulation skills of pupils (individual models of pupils' thinking in solving the given tasks, questions, etc.);
- independent work and responsibility for proper performance.



Teacher's expectations:

- *Students will be able to*
 - perform the task individually or apply time management skills;
 - independently analyze the information sources, questions, objects, phenomena according to the work plan;
 - will be able to process the information - to interpret, compare / contrast, classify, interpret, analyze, draw conclusions, and apply sequences;
 - will be able to ask questions and use the questions asked by the teacher;
 - use thinking tools (self-asked questions, thinking patterns, exploration or conclusion models);
 - apply information: evaluate, generalize, imagine, evaluate, predict, predict;
 - reflect.
- *Questions for reflection:*
 - How did the task work? What succeeded / failed?
 - What did you find out after completing the task?
 - What was the most difficult task for the task? Why?
 - Was it easy to collect information?
 - What Grade will you write yourself? Why?
 - What should be improved?
 - What would you do differently?

The role of the teacher in the task and presentation:

The teacher becomes a facilitator in student centered learning who deliberately presents the task to convey curriculum content, considering how each task affects the pupils' thinking, the level of thinking skills that certain tasks develop. Thinking is visualized.

- Thinking questions
 - Does the whole thing have only one main purpose?
 - How does creativity help in life situations?
 - What does it mean to "to think out of the box"?
 - Creating an educational environment. How will the educational environment be prepared?
- When the information is gathered, the creative project will be developed at home and at school, free from lessons. The final result a presentation, will take place during the lesson in the traditional environment.

Short conclusion. Teacher's reflection.

Created work, creative discoveries and insights – this will be the main aspect of evaluation.

*Author: Asta Macežinskiene
Kaunas st. Kazimieras progymnasium*

Topic: BUILDING BRIDGES

Target audience: students of all ages, preferably 11–14 years old students.

Subjects: Science lessons; tasks encouraging critical and creative thinking.

Aims: (recommended goal-oriented result - students will create, evaluate, analyze ... WHAT?)

- Students will identify the characteristics of the bridges.
- Activities will improve skills of engineering.
- Students will learn the main concepts of engineering.

Teacher's expectations (the role of the students)

- Define "engineering" or, for older kids, revise their understanding of what "engineering" is.
- Explain the project, as well as how it relates to engineering – mention the specific concepts it teaches: design process, critical thinking, etc.

The role of a teacher

- In the design phase students discuss characteristics of real bridges and common challenges. Then, students build their bridges and go through testing stages before they present their final project.
- Discuss what common problems need to be addressed when building a bridge – start by discussing its function and what might impede that function.
- The teacher provides pictures of real bridges and discuss what design features they have in common. Then discuss how these features contribute to the bridge's successful function.
- Students list the steps they will use to make a bridge or draw it. The students should be instructed to be as detailed as possible in order to facilitate the building stage.
- Once the designs are complete, students should have unlimited access to materials, but tell them to be reasonable - they should not use an entire box of toothsticks on one bridge.
- Using pre-selected materials, begin testing students' prototype bridges through strength challenges. Each new challenge should be heavier than the previous one. These challenges will reveal structural flaws in the students' bridges.
- Send students back to the drawing table, and have them re-work their bridges to fix the flaws. Consider having them start the entire process again – write out what issue they're facing, then draw/list how they will fix it in their new design.
- Bring all students' completed bridges together and test them through a single final challenge. This should be the heaviest challenge you present. A student whose bridge supports the weights for at least 10 seconds wins the challenge.

Creation of a learning environment. How will the educational environment be achieved?

Tasks are carried out in lessons, classroom hours or various extra-curricular activities.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

Bring all students' completed bridges together and test them through a single final challenge. This should be the heaviest challenge you present. A student whose bridge supports the weights for at least 10 seconds wins the challenge!

Short conclusion. Teacher's reflection.

Help and guide students.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: THE BEAUTIFUL AND THE BRUISED APPLE

Target audience: students of all ages, preferably 11–14 years old students.

Subjects: Science lessons, a task encourages critical thinking skills.

Aims: (recommended goal-oriented result – students will create, evaluate, analyze... WHAT?)

Aimed at anti-bullying, this activity shows kids how unkind words affect others with a simple yet impactful apple demonstration.

Teacher's expectations (the role of the students)

Students will discuss about the bullying with their class-mates by using good and bad apple.

The role of a teacher

- Before the activity, take one of the apples and hit it against a table to cause bruising on the inside of the apple (but don't let the kids see you do this, and try not to damage the outside of the apple).
- Have kids sit in a circle on the floor and hold up both apples. Ask them to describe the similarities between both apples.
- Next, take the "Bruised" apple and begin to call it names or tell how "horrible" it looks. Tell the kids that because you don't like it, you don't want them to like it either.
- Pass the apple around the circle and have everyone make fun of it and call it names. When everyone has had a turn, put it to the side.
- Now take the "Beautiful" apple and give it praise and compliments. Pass it around the circle so the kids can do it too. Place the "Beautiful" apple on the cutting board and slice it in half. Say something like "The apple we were kind to is so fresh and clear on the inside!"
- Then cut the "Bruised" apple open and say something like "The apple we were bullying and were unkind to is all bruised and mushy inside!"
- Ask the kids why they think it is bruised? How do they feel when others say unkind things to them?
- Use it as a conversation starter to have the kids discuss how they feel and situations they have experienced. Make a point to ensure they understand that when kids are bullied, they feel bruised on the inside, but may not show it on the outside, and how they can help when they see others being bullied.

Creation of a learning environment. How will the educational environment be achieved?

Tasks are carried out in lessons, classroom hours or various extra-curricular activities as well as outside the classroom.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

Consider the students's questions and behaviour according to the subject and their responses to their classmates. Since it is a critical thinking activity, there is no need to evaluate the students

Topic

Try to help the students to find out the correct questions and be aware of their behaviour towards bullying.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: HOW THE WATER CYCLE WORKS

Target audience: students of all ages, preferably 11–14 years old students.

Subjects: Science subject lessons, a task encourages critical and creative thinking.

Aims: (recommended goal-oriented result – students will create, evaluate, analyze ... WHAT?)

- Students will identify the stages of the water cycle doing a picture match activity.
- It will improve skills of experimenting.
- They will gain awareness of the natural processes.

Teacher's expectations (the role of the students)

- Elicit the students' answer about what they think about how the ocean gets full of so much water and how it stays so full.
- Project on the water cycle: "From the sky to the land and back again" worksheet.
- Explain that the answer to this question is part of what is called the Water Cycle and that they will learn more about it.

The role of a teacher

Refer to the labeled pitcher and flashlight and explain that these two items will be our models for the ocean and the sun. Point to the cotton ball and a bowl of water and refer to each as a cloud and rain puddle model, respectively.

Point to the pitcher and ask students to predict what happens first to fill up the ocean. Students will be likely to give the response of rain.

Students are then asked to wonder about where rain comes from. Ask them to think about a puddle on a sunny day that disappears. Explain that the water is evaporated by the sun (swab a cotton ball into the bowl of water while holding the flashlight with the other hand above) and is transferred into clouds in a process called evaporation.

Hold the flashlight over the plant and explain that the sun even draws water out of plants in a process called transpiration.

Announce it's raining as you squeeze the cotton ball into the pitcher ocean, adding that the cloud is full of water droplets that fall as rain if the air is warm enough. Refer to rain as just one form of precipitation.

Prompt students to think of how the moisture falls if the air is cold and point to the white patches of mountain snow on the projected worksheet. Explain that snowmelt runs down and is called runoff. Add that what doesn't fill up bodies of water soaks into the earth as groundwater that can be held for a long time there in what is called aquifers.

Model the steps of the water cycle to summarize as follows:

Sun heats water that becomes a gas. Hold the flashlight over the bowl of water.

Gas cools and turns into water drops that form clouds in a process called condensation. Display the water glass with droplets on the outside. Add that we can see this condensation on the bathroom mirror after we've taken a hot shower, because as the water droplets rise and cool they turn into fog clouds you can see on the mirror!

Dip a cotton ball into the pitcher of water and pour it into the bowl, then use the same ball to swab it up again.

Prompt students to consider that you used the same cotton ball to show both precipitation and evaporation. Add that this shows that the same water gets recycled, or reused, over and over.

Announce that we are seeing water that gets recycled over and over, and that this water is the water the dinosaurs tasted! Tell students that water never goes away, it just changes form.

Creation of a learning environment. How will the educational environment be achieved?

Tasks are carried out in lessons, classroom hours or various extra-curricular activities.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

- Open and project the worksheet completed during the guided practice.
- Distribute markers and direct students to circle incorrect answers and write correct answer above the circle.
- Collect worksheets to assign a percentage Grade.

Topic

Help and guide students.

Hold up each item used to model the water cycle and ask students to choral-say what it represents.

*Authors Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: GREENHOUSE EFFECT

Target audience: students of all ages, preferably 11–14 years old students.

Subjects: Science subject classes or as a task for critical and creative thinking.

Aims: students will understand that greenhouses can be used as temporary homes for plants.

Teacher's expectations (the role of the students)

- Let your students know that today's lesson will involve making a green house and learning about how plants grow.
- Hold up the picture of a greenhouse. Explain that some plants are placed into greenhouses, because greenhouses help them grow until they can be moved outside.
- Show the class the different types of seeds. While students examine them, talk about how the seeds can grow with water and soil, eventually becoming plants.

The role of the teacher in the task and presentation:

- Distribute a pair of scissors, a sheet of green construction paper, a paper towel, a recloseable sandwich bag, an eye dropper, and a cup of water to each student.
- Ask students to repeat the greenhouse construction process, and guide them through each step.
- Once they've finished, tell them to prepare the rest of their materials. They'll now begin preparing the inside of their greenhouses (to make the setup go more smoothly, you can model the following steps and have students copy your actions).
- Have students fold their paper towels into quarters. Explain that this means folding them in half one way, then folding them in half the other way.
- Have students place their folded paper towels into their recloseable sandwich bags.
- Have each student use her eye dropper to transfer water from her cup to her bag until the paper towel inside it is saturated, or completely wet.
- Distribute a bean to each student, then have students drop their beans into the bags and seal them.
- Have students tape their bags to the upper middle of their greenhouses, making sure that the beans are visible through the windows.

Creation of a learning environment. How will the educational environment be achieved?

- Tasks are carried out during lessons, classroom hours or various extra-curricular activities.

Assessment (the proof that students and teachers are satisfied with the results)

- Observe students over the course of the project and keep the following questions in mind: Did students understand the meaning of the word "greenhouse"? Did they show curiosity about the beans? Did they concentrate on the project and work well independently?
- Note down situations where students seemed confused or uninterested, and think about ways to make those situations more engaging.

Short conclusion. Teacher's reflection.

If a step seems too difficult for a student to complete on their own, assist them with it. For example, if a student has trouble cutting the construction paper, either guide their hand or cut it for them.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: BRIDGES MADE OF PAPER

Target audience: students 11–14 years old.

Subjects: can be used in a variety of subjects, but most suitable for Math and Physics lessons as a creative and critical thinking exercise.

Aims: working in groups build the highest bridge between paper chairs, formulate and answer questions.

Students will develop the following competencies:

- ability to think creatively;
- ability to remember / reproduce previously learned facts, terms and concepts;
- the ability to systematize information and create new forms of information provision;
- the ability to use knowledge in a new situation;
- the ability to see the logical, descriptive, and part relations;
- ability to express and defend one's opinion, based on reasoning, to analyze information;
- ability to formulate questions;
- ability to work in groups;
- ability to critically evaluate statements based on arguments.

How will creative and / or critical activities develop pupils?

In the lesson, some invisible „frames“ are created realizing three stages of a critical thinking model (awakening, understanding of meaning, reflection).

In the awakening and engagement stage, students are prepared to receive and understand information.

Teacher's expectations (the role of the students)

These lessons are conducted in small groups that are building bridges out of paper. The group is divided into several smaller groups of 5–7 members. The task for the group is to build the highest possible bridge connecting the chairs.

- The bridge supports can only rest on the chairs (do not rely on the floor between chairs, walls, etc.).
- The bridge must stand on its own and not be supported.
- The bridge must be strong enough to hold a full glass of water.

For all groups, the gap between the chairs must be the same, preferably for 1–1.5 m.

Each group has the same amount of paper - 30 sheets (old newspapers, magazines, etc.) and 3 m adhesive tapes.

Task 30 min.

10 min. prepare and reflect on the following questions:

- What do we know about building a bridge?
- Has anyone of us done something like that before?
- What is the most important thing in building a bridge?
- What are the principles for building a bridge?
- What materials do we have for the construction of the bridge?

20 min. bridge construction.

The groups compete to build a higher bridge.

When groups have built all the bridges, ask them to introduce their bridge, tell how they did it and how was it to work together. Then the bridges are checked for qualification: if they are stable, do not rely on the floor, retain a full glass of water.

Bridge inspection causes a lot of positive emotions and laughter.

The role of a teacher

The teacher becomes a facilitator of the process ("student centered learning"). Deliberately submit questions and tasks conveying curriculum, thinking how each task affects students thinking, what level of thinking skills a certain tasks develop:

- What do you know about building a bridge?
- Has anyone of you done something like that before?
- What is the most important thing in building a bridge?
- What are the principles for building a bridge?
- Pay attention to what materials you have for the construction of the bridge?

Thinking is visualized.

Questions for thinking, prepare and use HOTS (higher order thinking task) questions (specific questions tailored to a specific task):

- Why was such workflow?
- How did the group work?
- How was the decision to build a specific bridge made?
- Has the leader emerged in the group? What was the role of each member?
- What could you do differently?
- What did you find out about other members of the group and yourself?
- What can we learn from this exercise and situations?
- What conclusions can you draw?
- Where can this be important and useful?

Tools and methods of creative and critical thinking:

The lesson aims at active and conscious work of each student. Building a bridge is not a demonstration of students' skills, but a problem that a learner has to solve while working in a group, using the knowledge, experience, attentiveness, logic and creative thinking of their friends. This method combines two educational objectives – cognitive and emotional:

- systematize and consolidate previously studied subjects and use knowledge in new conditions;
- to react emotionally to the knowledge and understanding received;
- apply the knowledge gained in practice, develop personal learning and thinking skills.

Tools: paper (uniform for each team – 30 A4 sheets or 10 sheets of paper), paper adhesive (staining) tape, chairs (2 for each group).

Creating an educational environment. How will the educational environment be prepared?

- Both non-traditional and traditional (if applicable in the lesson) environment can be used to perform creative and critical tasks?
- Tasks can be performed in the classroom, in the natural environment or in other educational spaces.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

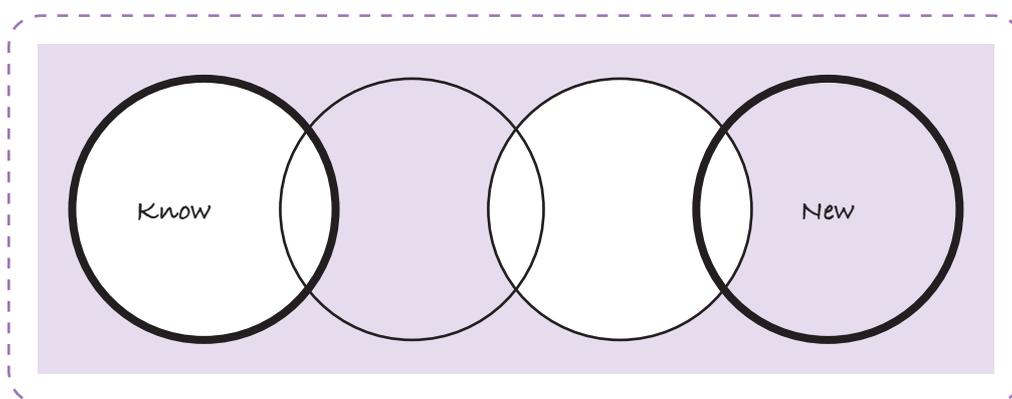
Performance self-assessment criteria.

Observing pupils' work, drawing conclusions on how to formulate thinking skills. Pupils are asked to tell how they worked in a group, what principle they distributed, how they chose the path, what they thought about their choice, what questions or tasks were the most difficult to develop and why.

Their actions are analyzed, failures seen with a sense of humor.

Short conclusion. Teacher's reflection.

The BRIDGE construction process is the perception of new content or meaning through activity. This is the second stage of critical thinking education, which not only keeps interest, attention, introduce the new content, but also promotes deep and meaningful consideration. After all, it is important to do the job not in the shortest possible time, but qualitatively. And to do this according to the requirements of the task, students must know the specificity of the bridge construction and think while working. It makes sense to link existing information with new information.



Finally, in the reflection stage, new content, ideas, concepts are rephrased, conveyed in their own words, creating new forms. This is how authentic opinion and understanding of various phenomena are formed.

Students realize that any task requires participation of all team members. While working hard, using the experience and skills of everyone, supporting and encouraging each other, they can even do the most difficult task.

*Author: Vilma Plutienė
Kaunas st. Kazimieras progymnasium*

Topic: SPORT AND HEALTH

Target audience: 11–15 years old, Grades 5–9. **Subjects:** English, Sport or Class lessons.

Aims: to develop students' creative thinking skills, improve learning skills, increase awareness of combining incompatible issues, and use the so called organ method in class.

Pupils will develop the following competences:

- ability to practice thinking tools (thinking processes), teach thinking as a basic skill;
- analyze objects, phenomena, events, activities or problems;
- develop research and problem-solving skills: how students use or create research models to draw conclusion or solutions to problems;
- improve the skills of decision making and / or the development of proposals for solving problems;
- strengthen students' self-regulation skills (individual student thinking models used to solve problems, issues, etc.).

How will creative and critical thinking activities develop students?

- students structure information and create new forms of presentations;
- criticize allegations based on arguments;
- clearly define the result to be achieved (SR);
- figure out what the final product will be (a presentation, a brochure, a poster, etc.)
- develop a strategy to achieve results;
- learn together, compare and create ready-made examples of innovative products and interesting solutions;
- demonstrate teaching and learning processes used to develop certain skills in thinking, behavior, co-operation and individual action;
- provide feedback (AS) on the goal (SR).

Teacher's expectations

- the "organ" method develops the youngsters' thinking ability to connect incompatible things;
- students learn together, compare, create ready-made examples of innovative products and generate interesting solutions;
- students learn to process information: explain, compare and classify;
- students interpret, analyze, draw conclusions, set sequences and synthesize;
- students ask each other questions and answer the teacher's questions.

The role of students

- take responsibility for their learning;
- understand what is the result to be achieved (SR) and how to achieve it;
- ask each other questions (metacognition) and answer the teacher's questions;
- create and present various training products: presentations, interviews, crossword puzzles, etc.;
- develop social skills such as co-operation, communication, etc.;
- work in pairs or groups (3–4);
- use different thinking tools (thinking patterns, problem solving models, etc.);
- think about the learning process and evaluate other goals;
- provides feedback (AS) on what helped to achieve the result (SR), why, what could be used next time, why, what needs to be improved, which tasks were useful, which tasks were less successful, what could be done in other situations next time.

The role of the teacher in the task and presentation:

- the teacher should understand that learning process is more important than the result;
- the role of the teacher in the task and presentation: includes personal responsibility for the perfect choice;
- raises students' knowledge level providing different information;
- creates the ability to analyze and prepare independent conclusions;
- teacher must anticipate the consequences of students' personal decisions;
- promote team activities and develop culture of a dialogue.

Creation of a learning environment. How will the educational environment be created?

- Student-centered learning environment;
- Encourages students to cognition, finding new discoveries and taking risks during the learning process;
- Builds faith for one's own strength and self-control;
- Encourages use technologies during research processes;
- Creates learning environment where students are not afraid of making mistakes, but see it as a development further.

Assessment criteria

Both pupils and teachers take part in the assessment.

Description of the performance level of the creative work *"Sport and Health"* (SLA).

Assignment. Create a presentation, brochure or any other product. (working in pairs and / or groups of 3–4 pupils).

"Sports and Health". Choose one kind of sport, find out how sport strengthens health, research and investigate various aspects of it, define what builds a healthy lifestyle, what happens in the human's body while doing sport.

The duration of the presentation is 7–10 minutes.

Criterion	Description	3	2	1
Description of a sport (min. 50 words)	Sport is described in the presentation or brochure and its description is provided (completely, partly, no description)			
Healthy lifestyle	The main factors that show a healthy lifestyle (eating, using water, sleeping, sport, etc.) are listed in the work. Information is provided (completely, partly, incomplete)			
Changes in the human body while exercising	The work refers to changes in the human body that affect the intensity of change, such as physical and emotional fitness, etc.			
Conclusion	Conclusion are drawn (completely, partly, incomplete)			
Layout of the work	The work has a clear goal (SR), the content is arranged in a logical order. The pages of the slides or brochure contain sequential information. The work contain references, quotes, sources used (completely, partially, and incompletely).			
Presentation of the work. Answering follow up questions.	Presentation is clear. The student can interact with the audience, answer questions about the content of the creative work (completely, partly, incompletely)			

NOTE:

- If the student works in a group (or a pair), all members of the group (pair) receive the same marks.
- In the classroom of 30 students, group presentations can be divided into 2–3 lessons.

Short conclusion. The teacher's reflection.

Using the method of "organ", the students take responsibility for their learning, develop their thinking skills, and form understanding that it is possible to combine the incompatible issues.

Using mind maps, created presentations, students learned to compare and develop examples of innovative products and provide interesting solutions.

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Topic: LIVE SCALE

Target audience: 11–15 years old, mostly Grades 5–8.

Subjects: different subjects, as creative and critical thinking is promoted by the task.

Aims: The task is designed individually, it encourages learners to concentrate, awaken their imagination, be able to think creatively, combining creativity with practical application. Students will try to look deeper into things or phenomena.

Students will develop the following competences:

- ability to analyze objects, phenomena, events, actions and problems;
- systematize information and create new forms for providing information;
- critically evaluate the statements in support of the arguments;
- improve student self-regulation skills (student's individual thinking models in solving tasks, questions, etc.).

How will creative and / or critical activities develop pupils?

The lesson creates some invisible “frames” - three stages of realization of a critical thinking model (excitation, perception of meaning, and reflections).

At the initial stage students are prepared to receive and comprehend information.

Teacher's expectations (the role of the students)

In a certain space on the ground (floor) a scale is depicted. At one end of the scale “+” (I agree) is highlighted on the other “-” (I disagree), in the middle there is a “neutral position”. The class reads a variety of statements related to the topic of the course, for example: “Critical thinking is logical thinking”, “Critical thinking can be learned” and etc. The participants are asked to rate, how far they agree with the statement and stand on that scale, which corresponds to their opinion (from “-” to “+”). You can ask to comment on their opinion.

The role of a teacher

The teacher is the main leader of the activity, presenting the task and conveying curriculum content, thinking how each task affects students' thinking, what level of thinking skills they develop with certain tasks. Thinking is visualized.

Questions for thinking – to prepare and use HOTS (higher order thinking task) questions (specific questions tailored to a specific task):

- Is critical thinking a logical thinking?
- Can you learn critical thinking?
- What was most surprised?
- Will I be able to use the found link in my everyday life? Where?

Tools and methods of creative and critical thinking: conversation, demonstration, game elements, analysis.

Creating an educational environment. How will the educational environment be prepared?

- In an unconventional environment, teaching / learning will be undertaken to carry out creative and critical tasks.
- Tasks are carried out during lessons, during classroom hours, different after-school activities.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

- *Foreign language lessons:*
 - Language coherence, fluency, correctness when presenting links found.
 - Regularity of foreign language use.
 - Regular use of foreign language words.
 - Use of daily foreign language phrases.
- *In other lessons or activities:*
 - Ability to adopt an appropriate strategy.
 - Non-verbal language.
 - Respect for others.
 - Observing students' work, drawing conclusions on how thinking skills are used. Students are asked to tell about how they worked, what paths they were choosing, what they were thinking about choosing their own path. Their actions are analyzed. Humor is looking at failures, tracking how many times you try.

Short conclusion. Teacher's reflection.

Try to think extraordinary, look for interesting and innovative solutions.

Encourage experimentation.

Encourage interest in the history of discovery, and develop memory in various areas.

It is possible to encourage learners, search for examples of unexpected discoveries and present them to classmates.

Topic: A CREATIVE STORY DIFFERENTLY

Target audience: students of all ages, most 5–8 Grade students.

Subjects: to encourage creative thinking, the tasks may be designed for different subjects, but the most suitable for the Lithuanian language and literature.

Aims: to produce a creative story through interaction and collaboration in groups according to the case of a noun, creative thinking in words and images.

Depending on what kind of lesson or educational activity is to be performed.

Students will develop the following competencies:

- ability to think creatively;
- systematize information and create new forms for providing information;
- critically evaluate the statements in support of the arguments;
- improve self-regulation skills (individual and group thinking models for students in solving tasks, questions, etc.).

How will creative and / or critical activities develop pupils?

The lesson creates some invisible “frames” seen as three stages of realization of a critical thinking model (excitation, perception of meaning, and reflection).

At the warming up and engagement stage, students are prepared to receive and comprehend information.

Teacher’s expectations (the role of the students)

1. The teacher presents to students groups 2 cards with nouns in conjunction with titles.
2. Each group pulls out a card for students, reads and sets the following question: (what?).
3. It is agreed that all nouns in the text should answer the question that they have withdrawn.
4. The groups invent the name of a creative narrative, create a plan and write nouns i.e. attractive words that are converted to the required abbreviations (For example, what kind of kittens, houses, money, poverty, work etc.).
5. In groups, pupils create a narrative based on the plan and supporting words.
For example, “Once there lived a kitten. He did not have home because he had no money.” Do not hesitate to monitor their work.
6. Students present creative stories, answer questions from the audience.

The role of a teacher

The teacher becomes a student centered learning facilitator. They deliberately present the task by conveying curriculum content, thinking how each task affects students’ thinking, what level of thinking skills they develop with certain tasks. Thinking is visualized in order to get and understand the information.

Questions for thinking. Prepare and use HOTS (higher order thinking task) questions (specific questions tailored to a specific task):

- Why is this narrative going?
- Why does it end this way?
- What is the climax of the work?
- How did the narrator feel?
- What can we learn from this exercise and situations?

- Where can this be useful?
- Is it relevant to you?
- How was the idea of implementing this situation?
- What could a storyteller do differently?
- What questions did you raise to yourself that were useful for storytelling?

Tools and methods of creative and critical thinking:

Group work, discussion, narrative, demonstration, explanation, conversation, case analysis.

Tools: board, multimedia, paper, flip charters, tablet or a stationary computer.

Creating an educational environment. How will the educational environment be prepared?

- Unconventional or conventional (if this lesson is applicable) training environment in order to carry out creative and critical tasks.
- Tasks can be carried out in the classroom, in the natural environment, in other educational settings.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

Creation of a plan, finding new words, consistency of events, activity.

Observing students' work, drawing conclusions on how thinking skills are used. Students are asked to tell about how they worked in a group, how it was distributed, what was chosen, what they thought about their path choices. Their actions are analyzed. With humor seen in failures.

Short conclusions. Teacher's reflection.

Will it be able to quickly and flexibly accept unexpected situations, challenges, communicate better, collaborate with peers, speak clearly, listen, text, solve problems creatively, thinking using words and images and a sense of humor. Independent thinking and responsibility are appreciated.

Topic: VALUES THEATER. AN ACTIVITY THAT ENCOURAGES THE PLAY, ANALYSIS AND RESOLUTION OF CONFLICT SITUATIONS

Target audience: 11–15 years old students, mostly Grades 5-8; as the task promoting creative and critical thinking. **Subjects:** different subjects.

Aims: the assignment is intended for student groups, it encourages learners to collaborate, listen to another opinion, to be able to express their thoughts in a clear way, to develop leadership skills.

Related themes: depending on what kind of lesson or educational activity is to be performed. But if the class hour is considered, it can be related to conflicts, bullying, etc.

Students will develop the following competencies:

- students' ability to analyze objects, phenomena, events, actions, problems;
- organize information and create new forms of information presentation;
- critically evaluate the statements in support of the arguments;
- student self-regulation skills (individual and group thinking models for students in solving tasks, questions, etc.).

How will creative and / or critical activities develop pupils?

The lesson creates some invisible „frames“ - three stages of realization of the critical thinking model (excitation, perception of meaning, and reflection).

At the wake-up and engagement stage, students are prepared to receive and comprehend information.

Teacher's expectations (the role of the students)

Students need to be divided into smaller groups of 4 or 5 children. At that time, the task assigned to groups is to recall a specific life situation (from their experience in a family, school, work or organization activities) or a conflict that has arisen from different attitudes or values of people.

The groups are given 10 minutes to share their thoughts and come up with a situation.

Then groups are asked to prepare a short play (up to 5 minutes duration) and role play that situation to other members of the group. The group is given 30 min. time to prepare.

Then the groups are invited to get together and start acting.

Later, the situation is briefly discussed and students are asked to suggest what actors in this situation could do otherwise. "What conflict did you notice here?", "Why was the idea to play such a conflict?", "What were differed people's views in performance?", "How could this be solved?", "What the participants in the situation could do differently".

Later, another group is invited to play their own situation. Everything is repeated in consideration of another situation.

The role of a teacher

The teacher becomes the facilitator of the process ("student centered learning"). They deliberately presents the task to convey curriculum content, considering how each task affects students' thinking, what level of thinking skills they develop with certain tasks. Thinking is visualized.

Questions for thinking, prepare and use HOTS questions (specific questions tailored to a specific task):

- What have we generally seen in all situations?
- What caused conflict, what helped to solve it?
- How did “actors” feel?
- Who was the hardest to play?
- Were you able to influence the behavior of the other actors?
- What can we learn from this exercise and situations?
- Where can this be useful?

Tools and methods of creative and critical thinking

Group work, conversation, performance, demonstration, game elements, discussion, situation analysis.

Measures: various objects and tools needed for the role-play.

Creating an educational environment. How will the educational environment be prepared?

- Unconventional or traditional (if lessons will be applied) environments, will training be in place to carry out creative and critical tasks?
- Tasks can be performed during the lessons, Class hour, after various classroom activities.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products.

Different classes or activities:

The ability to take the right strategy, distribution of roles in teams, taking leadership positions.

Observation of students’ work, conclusion, the use of thinking skills. Students are asked to tell about how they work in a group, how the principle of distributed roles, what it was the path chosen, what they thought about their path. Analyzing their actions. With humor seen in failures followed, the number of times trying.

Short conclusion. Teacher’s reflection.

Students will be able to communicate faster and better with others, communicate clearly, listen to, create text, and creatively think both words and images in solving problems.

They try to think extraordinarily, search for interesting and innovative solutions, and encourage experimentation. The activity will promote interest in the history of discoveries, develop memory in various fields.

It is possible to encourage learners, to look for examples of unexpected discoveries and present them to classmates.

*Author: Vilma Plutiene
Kaunas st. Kazimieras progymnasium*

Topic: NATURAL AND ENVIRONMENTAL HAZARDS

Target audience: students of all ages, preferably 12–13 years old.

Subjects: various subjects, tasks are designed to boost critical thinking.

Aims: (recommended goal-oriented result – students will create, evaluate, analyze ... WHAT?)

The task focuses on students' reading comprehension, research, interpretation and drawing conclusions.

Students will develop the following competencies:

- will be able to classify and compare;
- will be able to make predictions;
- will improve the skills of evaluating the situation;
- will be able to organize the information.

Teacher's expectations (the role of the students)

The work will be an individual research and then group work. Students will discuss the present situation and make comparison and then will reach a conclusion.

The role of a teacher

During the presentation phase, the teacher may ask students a number of questions in a way not to disturb the presentation. By organizing discussion groups, it should be ensured that positive or negative ideas are shared without being transformed into a discussion environment. It is important for everyone to be able to defend their opinion and to participate.

The students will be able to work in pairs, groups (Different groups will be created and a discussion method will be used).

- Students will research the subject, collect the information, analyse, summarise and prepare a presentation.
- Students can ask questions, make comments and discuss with others about the subject.
- Teachers direct their students to critical thinking and are expected to be prone to critical and creative thinking.

Creation of a learning environment. How will the educational environment be achieved?

- In an unconventional environment, will teaching / learning be undertaken to carry out creative and critical tasks?
- Tasks are carried out during lessons, during classroom hours, during various extra-curricular activities.

Performance evaluation criteria. Criteria for the assessment of learning outcomes / products:

- Controversy/predicting; Brainstorming; Summarising; Concluding; Group work.

Topic

Help and guide students.

Encourage students to cooperate.

Highlight the important points of the discussion.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: CREATIVE THINKING WORK

“THERE IS/ THERE ARE” (ENGLISH GRAMMAR USE)

Target audience: 13 years old. **Subjects:** English. There is There are/ prepositions of place

Related areas: Parts of bicycle. **Integration subject:** quantifiers/ prepositions of place

Students will develop the following competencies: drawing pictures

Aims:

In this lesson students will learn how to use prepositions of place correctly when they are describing a picture. Firstly, the students give the teacher a drawing dictation as a whole class. Then they work in small groups to give drawing dictations to each other. Teachers can adapt the level of this activity by making the language more or less complex. The core language from this lesson will be useful for oral exams in which students have to describe or compare pictures.

Students' can analyze the text carefully to organize information and to create new forms of presenting information as a picture.

How will creative and critical thinking stimulating activities develop students?

The learners work in pairs and as a group, which allows them to compare answers and clarify problems together in English.

Teachers can evaluate the impact and effectiveness of pair work on their learners by using action research tools such as asking the learners how they feel about working like this or by actually participating in a pair work activity and evaluating this experience afterwards.

Teacher's expectations (the role of students)

Instead of spending hours making cut-up activities such as flash cards for matching vocabulary and their definitions, students only need a blank piece of paper. This activity also gives the students more listening and writing /spelling practice.

To save time, the class can be divided into two groups and the words/phrases/pictures dictated quickly with each group required to write down only half the words given.

The aim of dictations:

Students can focus on both accuracy (form) as well as meaning – e.g. “dictogloss activity”.

Students can develop all four skills; speaking and pronunciation can be developed if the students do the dictating rather than the teacher.

The activity gives the students an opportunity to notice features of pronunciation such as weak forms, linking and elision.

Additionally, dictation activities when students compare their version of the text/picture to the original, can increase their ability to notice aspects of the language which are sometimes overlooked, as well as mistakes which they commonly make. These might include common spelling errors, absence of articles or the third person ('s') rule, etc. This comparison also helps students to become better at identifying errors in their own written/drawing work.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. The teacher has to offer tasks by conveying the educational content, to think about how every task affects the student's thinking, what level of thinking skills are developed by certain tasks. Thinking is visualized and / or is discussed.

For example:

- learning sources: picture;
- questions that stimulate thinking: to prepare and use HOTS (higher order thinking task) questions (specific questions designed for a specific assignment);
- creative and critical thinking tools and methods: to provide and describe the tools used in an assignment(s): problem solving models, Mind Maps etc;
- creative and critical thinking products/results: what will be produced? Provide examples and suggestions to create more varied learning results;
- to create “trestles”: to channel students towards the correct learning result creation stages. (questions, hints, comparisons, metaphors etc., which will assist students in “approaching the result”.
- PST: Provide examples with descriptions.

Creation of a learning environment. How will the educational environment be achieved?

- Students can integrate and evaluate information presented in diverse forms of the media and a variety of formats, including visually, quantitatively, and orally.
- Students can develop the topic with relevant, well-chosen facts, definitions, specific details, quotations, or other information and examples.
- Students can use precise language and domain-specific vocabulary to inform about or explain the topic.

Assessment (the proof that students and teachers are satisfied with the results)

Activity evaluation criteria. Learning results (products) assessment criteria.

- It is a fun activity so the main result of the activity should not be evaluated or Graded, but the teacher can observe how well their students apply skills and grammar rules.

Short conclusion. Teacher’s reflection.

Help and guide students.

Encourage students to cooperate.

Highlight the important points of the discussion.

*Authors: Serap Ozdemir, Sinan Sari
Kocaeli IL Milli Egitim Mudurlugu, Turkey*

Topic: AIR POLLUTION PROBLEMS: ACID RAIN

Target audience: 13–14 years old, Grade 8, students of mixed learning abilities.

Subjects: Chemistry, Science, Environmental education.

Aims: to promote understanding and increase awareness of the causes of air pollution and its impact on the environment.

The expected results:

- to explore some visually informative material and create a mind map;
- to analyze and evaluate the causes, impact and consequences of the acid rain;
- to create and offer different problem solving models;
- to create and formulate questions for interviewing a conservation specialists of a local municipality.

Pupils will develop the following competences:

1. The ability to identify, explain, analyze and offer environmental pollution problems and solutions:
 - a) the ability to enumerate some causes, consequences and problem solutions for the occurrence of acid rain;
 - b) the ability to describe the acid rain process by describing its causes, consequences and solutions; explaining the impact and justifying suggestions for problem solving.
2. Cooperation skills working in pairs and groups for analysis of the situation, providing suggestions and decisions.
3. Skills to explain the relevance of information to everyday phenomena and particular cases.
4. The ability to observe the demonstration and make assumptions.

How will creative and critical thinking tasks develop pupils' individual activity, collaboration, thinking and behavior?

The use of video sources, visual images, demonstration and verbal information on air pollution will help each pupil individually understand why air pollution is caused, how dangerous it is and how it can be decreased.

Pupils work individually and in pairs, using the "mind map" of task 1 in their worksheet.

- 1) after watching video on youtube <https://www.youtube.com/watch?v=iS8ksU-nOdc>;
- 2) after studying the picture in the worksheet (the poster's research);
- 3) after observing the teacher's demonstration (development of sulphur dioxide, water solubility and pH testing of the aquatic environment).

Pupils working in pairs learn about each other's understanding of the topic, discuss and compare their judgements.

Having completed pair discussions, students individually complete task 2 on their worksheets. In this exercise, the pupils' responses focus on a number of important aspects analysing and explaining the facts.

Then, groups consisting of 4 pupils are formed, and they compare each other's answers to task 2 questions in a group of 4, comment, discuss or support each others' ideas and express their point of view. One pupil from the group is given the opportunity to present summarized answers to the other pupils of all groups, who in turn approve or ask questions.

In task 3, while discussing each group analyse and determine the best possible proposals for the solutions to the acid rain problem, compile their ideas and proposals and design a presentation that is

presented to other groups. There are 5 interview questions that groups develop for the conservation-ist of a local municipality on the topics of local environmental pollution. The task enables pupils to use the knowledge acquired in real-life situations. Pupils develop the skills to take responsibility for their work outcomes, to cooperate with other pupils in order to achieve results and also develop the skills of analyzing, observing and solving particular problems.

The next step of work can be a broader project on environmental pollution on a local, regional and global scale, including such approaches as a display of problem solving routes, interview questions and observations of the presentation.

Teacher's expectations (or the role of the students)

Pupils work individually, in pairs and in a group. Pupils use visual aids in the learning process, e.g. visual supports (images, video or demonstration) that help to understand the relationship between events and the phenomena, illustrate the content of concepts, and make teaching material and ideas more attractive. Furthermore, visual aids help memorize important information better. Pupils develop the skills under focus, create a mind map, process and systemise visual information and develop personal learning strategies.

The tasks are valuable because they help learners to understand the importance of air pollution, relate their personal experience and interest, also encourage pupils to think, ask, answer and act. Questioning, information analysis, and synthesizing skills are developed during class activities. The content of the exercises (interviewing professional environmental representatives) stimulates pupils' independent thinking.

Pupils use a graphical tool to organize the information. The method of mind mapping helps the pupil realize the cognitive process of learning material step by step, starting with grouping, systematizing and proceeding to abstract thinking, memorizing and reproduction of the knowledge, as well as acquisition of specific skills and abilities. In the pre-prepared mind map skeleton worksheet, the pupil can write the information obtained from watching videos, analyzing posters, and demonstrations in a concentrated manner. The idea of creating a mind map is facilitated by the teacher who has given the instructions so that the pupil could find answers to the problems while creating a mind map.

Link to real life: understanding of the essence of the issue and process. It is possible to apply the acquired knowledge and skills in other subjects and spheres of life.

Pupils should take responsibility for their learning by asking questions as well as answering questions of classmates and the teacher.

An important aspect is the development of pupils' cooperation skills in the group work, since the final outcome of it to a large extent depends on the contribution of each pupil in the achievement of the big goal.

What is the role of the teacher in the task and presentation?

The teacher offers pupils a number of advanced tasks, the content of which affects the depth of each pupil's thinking (analysis, synthesis and evaluation).

In the development of thinking skills, the model of gradual disintegration is used: pupils perform exercises independently supervised by the teacher and independently use their knowledge and skills. Deeper thinking begins when responding to the information received, the learners start asking questions. The teacher creates situations in which pupils have to learn the questioning skills: confidence to ask questions, skills to formulate questions, follow what is happening or be able to relate their questions to a particular issue or topic. The level of thinking deepens on the ability to retain previously learnt facts and to make judgments about the relevance of the solution to a problem considering the goals set by the teacher. In formulating tasks, the teacher uses particular key words: evaluate, convince, defend, criticize, decide, summarize and support.

The teacher offers pupils a number of advanced tasks whose content influences the depth of each pupil's thinking capabilities (analysis, synthesis and evaluation).

The teacher offers:

- visual and verbal information;
- transformation of observation and structuring it in the form of a mind map;
- critical evaluation of the benefits, risks and consequences of the problem;
- creative expression for consolidating knowledge, expressing ideas, challenging or supporting others' ideas;
- teaching the ability to ask and answer questions by asking the members of work groups to use the words: Do you agree ...? What is your opinion...? How important and what is the significance...? What do you suggest...? How do you rate...? Why is it better than...? What would you do if...? This questioning approach encourages pupils to think deeper (deep thinking);
- working in a group, in pairs and individually practice;
- development of the observation skills.

Materials and learning environment

The completion of tasks is planned for two regular classes. Pupils' learning takes place in a classroom where it is possible to use IT (a computer, a projector, a Wi-Fi connection to the Internet) and a tablet for each pupil. Introducing the issue of air pollution via demonstrations of chemical processes, motivate pupils to generate more interest and develop a more diverse cognitive process.

Assessment of the results of pupils work

Criteria for evaluation of group presentations

Criteria	Range of acquired points	Acquired points
1. Content		
1.1. Relevant to the subject, content sufficient, reflected in a comprehensive manner, information understandable, relevant and specific.	0–8	
1.2. The content correctly structured, clear, carefully and thoroughly designed.	0-2 0–10	
1.3. The content of the interview questions, volume, at least 5 key words for the selected topic, simple and correct language of questions.		
2. Forma		
2.1. Presentation of the work.	0–5	
2.2. Presentation convincing, reflects all essential points.		
2.3. Dominates speaking, not reading.		
Total	25	

Students' self-assessment

After completion of the task, pupils carry out self-assessment by answering questions on the tablets using one of the training platforms KAHOOT – a site where pupils respond to the questions and receive rapid feedback.

- what we did;
- why we did it;
- what I learned today;

- how I can apply it;
- what issues still remained unclear to me and I want to discuss them.

The teacher gives feedback.

If the tablets are not available, the pupils can use their cell phones or answer using the stick notes that the teacher collects, quickly revises and gives feedback.

Short conclusion. The teacher's reflection

The teacher comments and concludes to what extent the the aim of the lesson is achieved, how much the methods used were useful and effective, what activities were successful and what issues should be addressed once again.

Tips for Parents

1. Engage positively in the development of critical thinking skills of the child.
2. Do not reject statements made by the child but support and discuss them.
3. Help the child to find evidence for decision-making.
4. Recommend the child some trusted sources of information for their research.
5. Clarify a number of views before making decision.
6. Develop a family environment and a sense of belonging to the child's freedom of thinking.
7. Help the child to admit errors and correct them - listen to different opinions and identify the causes of errors.

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*Author: Daina Keidane,
Education and Information Services of Riga City (RIIMC), Riga, Latvia*

Topic: DO ENERGY AND SPORTS DRINKS IRREVERSIBLY DAMAGE TEETH?

Target audience: 14–15 years old, Grade 9. **Subjects:** Chemistry, Biology.

Aims: To encourage pupils' research and practical activities that address problem orientated action and decision-making based on creative and critical thinking. To learn about the risks of using energy and sports drinks and their impact on dental health; to evaluate the attitudes of youngsters concerning the use of energy and sports drinks.

Tasks:

- to search for and systematize information, using various resources about the risks of using energy and sports drinks and their impact on dental health;
- to discuss about the risks of using energy and sports drinks and their impact on dental health;
- to prepare a computer presentation about the chosen field;
- to cooperate in a group, taking individual responsibility for the result.

Pupils will develop the following competences:

- the ability of working with the Internet texts and understanding information;
- mastering the most important information search methods and development of media competences;
- the ability of critical evaluation of information and offering different models of solution, independent construction of knowledge and making decisions;
- the social competence - independent, self-organized and cooperative learning;
- skills to develop creative potential;
- the ability of speaking, presentation, drawing conclusions and asking questions.

How will creative and critical thinking tasks develop pupils' individual activities, cooperation, thinking and behavior?

The Webquest method is based on the importance of pupils' own-initiative in learning. Pupils themselves, following the teacher's offered course of work (the WebQuest description), organize the teaching process.

Pupils should use different sources of information, set targets and find solutions, plan activities and make decisions by themselves. Pupils are equal learners, debate and learn from each other. During the performance of the task, pupils can work in smaller groups or pairs. The group work tasks are chosen for every small group and employs every pupil. By organizing work in groups, pupils develop the sense of community, build confidence, can demonstrate their personal capabilities, learn from the peers, develop skills of communication, and help to understand the problem of work together.

Pupils can choose an individual pace of learning the content and return to issues that have not yet been sufficiently learned. Therefore, it is possible to ensure that the learning process is individualized, depending on the different level of prior knowledge and skills of pupils and on the psychological characteristics, including temperament, way of thinking and pace of work.

Teacher's expectations (or the role of pupils)

The final outcomes of the WebQuest project are considered to be a discussion and presentation prepared by pupils. Pupils are divided into groups and accomplish the tasks of the group. The members of the group split their responsibilities by selecting an expert who will represent the group's work in the discussion, information compilers and presentation makers. The members of the group create a mind map on how to fulfil tasks by ensuring that the work is distributed equally to all participants.

Firstly, in the course of work pupils find out the usefulness of the information sources for the project – highlight the most important, relevant information distinguishing it from the less important and only then use it. The necessary information is selected – only understandable texts are chosen, texts are sorted regarding the tasks. Pupils search for high-quality images or drawings. Pupils carry out a survey among their peers to gain an opinion on the consumption of energy and sports drinks and attitudes of youngsters to health care.

A computer presentation is created that corresponds to tasks and complements the expert's narrative during the discussion. Participants take part actively in the discussion, expressing their views and raising questions. The following words to make questions are used: Do you agree...? What is your point...? How important and what is the matter...? What do you suggest...? How do you judge...? Why is it better than...? What would you do if...? Such a question-setting approach encourages pupils to think more deeply (deep thinking). At the end of the discussion, each group summarises the analysis by formulating thesis and presenting it to the other groups.

The role of the teacher in the task and presentation:

The structure of the Webquest method consists of six methodically justified steps of the work description: introduction, task formulation, course, bibliography, presentation and evaluation.

The teacher finds the most appropriate and relevant sources of information useful for addressing the problem that is formed by selecting the most relevant information. The most information offered by educational resources must be available to pupils in the classroom, libraries or the Internet, if necessary the teacher copies it. Pupils can find additional information on their own.

The teacher creates a WebQuest description of the progress and pace of work, but it is carried out independently by the pupils. The teacher tries to minimise the ability of pupils to work in accordance with their interests, but at the same time closely follows the work of setting up schemes, because later it can be used to allocate duties and to develop presentation content. This method highlights processing of the information.

If it is necessary the teacher provides advice and support in the phase of self-learning. The teacher observes the cooperation of pupils in each group and, if necessary, advises, explains where and how information can be found, helps to structure and understand it. The teacher must follow that pupils are not confused by the abundance of information and do their work successfully in overcoming the difficulties.

The teacher invites pupils to pay special attention to individual topics during the information selection phase such as the composition of energy and sports drinks, their acidity level, mouth and teeth health, and to reflect the positive and negative aspects of drink selection, justifying their arguments about the influence on health.

The role of the teacher in the task and presentation: in organising the discussion is

- to stimulate, encourage pupils to exchange views without interfering and correcting them;
- organise a discussion with a creative and critical approach to solving problems can change the passage of a pupil's judgements – expanding the idea or changing its direction by asking questions of the type such as: What factors can still affect? What alternatives are still possible?

The teacher enables pupils to:

1. Assess critically sources of the Internet and the information contained therein;
2. Express themselves creatively by reinforcing the acquired knowledge, expressing ideas, challenging or supporting others' ideas;
3. Teach skills of answering and asking questions;
4. Ask participants to use the words: Do you agree...? What is your point...? How important and what is the meaning...? What do you suggest...? How do you judge...? Why is it better than...?

What would you do if....? This approach encourages pupils to think more deeply (deep thinking);

- Learn the skills of working in a group and individually.

Creation of a learning environment. How will the educational environment be created?

Task learning is scheduled for one week. Pupils' learning takes place in the classroom, at home, and at independently selected location where IT can be used (computer, Internet). For discussion in the classroom, the room is arranged so that the main debaters sit in front of the classroom on chairs arranged in the form of a letter U. The discussion is initiated by 4 pre-prepared pupils - experts expressing their views in the presence of other pupils. 20 minutes later, the leader of the discussion invites the other pupils to engage in the discussion. At the end of the discussion, the leader provides a brief summary, invites pupils to compare beliefs and evidence in the use of sports and energy drinks and their impact on teeth health and to formulate the main thesis.

The project has to be evaluated.

The outcome of the project (the content and design of the prepared presentation) and pupils' working process are being assessed.

WebQuests evaluation criteria

Very good/ good 3 points	Sufficiently 2 points	Insufficiently 1 point	Gained points
1. Content correctness and completeness			
All the issues on the subject are presented correctly and completely.	The most important issues have been sufficiently outlined.	The most important information is missing or incorrect.	
2. Cooperation in the group			
Work has been done in cooperation all the time.	Cooperation in most cases.	Often worked apart, by-work is done.	
3. Multiplicity of media use			
Searching for information in all available media.	Usage of various sources.	Usage of some sources.	
4. Design of presentation material			
Rich pictorial material. The information is presented in a sequential, planned, easily followed manner.	Sufficient pictorial material. The information presentation contains some shortcomings.	Poor pictorial material. The information presentation partly respects comprehensiveness and plausibility.	
5. Presentation			
Fluent speech without losing basic thought.	Successful presentation, some flaws in a free narrative.	Unprepared presentation, the text is simply read out.	
6. Preparation of questions			
All questions are clear, accurate, and consistent with the most substantial in the theme.	In general, the questions are clear and accurate, not all of which are relevant to the most important topic.	The questions are not clear and accurate, do not fit into the most substantial in the theme.	

Questions for self-assessment of the pupil.

Have the project objectives been achieved?

How did you cooperate in the group?

Was the WebQuest project method difficult?

Specify the difficulties.

Have you gained any information? If yes, which information is new for you?

Which skills have you improved while developing this project?

Obtained assessment

Points	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18
Mark	1	2	3	4	5	6	7	8	9	10

Short conclusion. Teacher's reflection

The teacher concludes about the achievement of the target, the used method's effectiveness on what has been achieved and on which issues more attention should be paid.

Tips for parents:

1. engage positively in developing of critical thinking skills of a child;
2. accept the questions with an "open mind", do not reject children's statements, discuss them instead;
3. help the child to find evidence to make decision;
4. suggest the child to search information from reliable sources of information;
5. find out several opinions before decision making;
6. create a family living environment and a sense of belonging to a child's freedom of thought;
7. help the child to recognize the mistakes and correct them, which means listening to different opinions, understanding where the causes of mistakes are found.

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*Author: Daina Keidane
Education and Information Services of Riga City (RIIMC), Riga, Latvia*

TEACHING METHODOLOGY FOR TEACHERS AND PARENTS

Tasks for 15–18 years old pupils

Topic: CRITICALLY EVALUATE THE VERY ANNOYING PROBLEM: WHY ARE WE CONDUCTING ELECTRICITY AND HOW TO AVOID IT?

Target audience: 14–15 years old age group, Grade 9. **Subjects:** Physics.

Using active and productive reading techniques, working individually and in groups, will read and analyze the text, learn the necessary information in the text, supplement it and benefit in practice.

Students will develop the following competencies:

- Develop an active personal position when analyzing text content.
- Introductory and meaningful reading skills.
- The ability to substantiate your own reasoning with strong arguments and compelling reasons.
- Ability to listen to each other, mutual understanding, respect.
- Ability to evaluate text information from different positions.
- Ability to self-assess.

How do creative and / or critical activities educate students?

In the lesson, three stages of realization of the critical thinking model are created (awakening, understanding of meaning, reflection).

- First step – *excitation*.

There are several goals at this stage.

1. The first goal is to help students to test their existing knowledge and beliefs, to create a broader basis on which to base a long-term understanding of new information. Students are provided with some examples of their life experiences (eg, or several questions (from pictures) or a demonstration by a teacher.
2. The second aim of the awakening stage is to knock the pupils actively into their learning. They have to show in some form (their thinking, writing or language) that this topic is relevant to them and they can express their point of view.
3. The third purpose of the awakening is the interest in the topic and the setting of the goal of the lesson.

At the level of sense perception, students, when reading the text, will master the methods of INSERT and TEXT REVIEW, having heard the thoughts of others by DISCUSSING the expression of their problem. Pupils will fill in a table in which the tags know what they don't know or what they have doubts about. These methods will provide the conditions to develop the above-mentioned competences.

- *Reflection stage*. Using the created product (table), discussing with each other, finding out things that are incomprehensible to them, and demonstrating their understanding. Interrogating, arguing, arguing with a partner or a group of their own ideas, by asking themselves (do I know?) And listening to the thoughts of other students (I did not know, but I already know). It adds new knowledge to the overwhelming essence of the electrification phenomenon and enriches its experience by sharing it with others.

By applying the method of the UNCOMBINED SUMMER, you will consider what you know, what you don't know, what else you need to know to understand the topic.

Teacher's expectations (the role of the students)

- Pupils remember when they experience unpleasant discharges due to electricization, how they try to avoid it. Openness of students is promoted, students' ability to listen to each other, mutual understanding and respect are developed.
- Students are reminded (familiarized) with non-fiction literary reading methods: introductory, meaningful, and interactive. Examples are provided. Students demonstrate their ability to apply various methods of text reading.
- Use the INSERT method when reading text. Meaning in the Perception Percentage will mark the text with the symbols and fill the table. To make the records short and concise, you will understand that this is a kind of short synopsis.
- When reading the text individually, use the signs to fill in the table.

Students are advised to use the following contractual signs:

√	I already knew
±	It's new
-	I thought differently
?	I did not understand, need to find out

The same table will be used in the reflection stage.

- After the table is filled, a discussion will take place, the pupils will discuss their certificates, publicize the work and present it.
- A teacher summarizing the results of the table will receive answers to the following questions:
 - What are the most important thoughts in each paragraph?
 - Read the most interesting places in the text. What do you think the information is interesting?
 - What did you read about the electrification and ways to avoid it?
 - What marks indicate that the bodies are electrically energized?
 - Tell us why you need to keep in mind the ways to protect yourself from electric shock?
- Maybe you know your "recipes"?
 - What are the ways of electrification?
- The TEXT ASSESSMENT method, the key technique for active and productive reading, continues to apply.
- Pupils look at the text in general as a piece of information. Pupils are encouraged to evaluate the content of the text, not the paragraphs, but the whole.
 - What did you pick the most important in the whole text? Why?
 - What was the term (word, phenomenon) most commonly encountered?
 - What facts are described most widely? Why?
 - In what part of the text (paragraph) did you find answers to the questions: Why are we energizing? How to avoid it?
 - What knowledge (experience) could you enrich this text?
- Pupils assess themselves through the UNCERTAIN SESSION test

Pupils rethink their knowledge, activities and self-assessment in order to use the information they have received in life situations, and apply active and productive reading techniques to other subjects.

What is The role of the teacher in the task and presentation: in the task of the students?

Learning Sources: Educational Text and the Internet, if necessary.

In the evocation stage (evocation), the teacher provides some facts about how to avoid body electricity.

1. In large electronics factories, workers wear special antistatic bracelets (Figure 1).
2. A rubber strip filled with graphite, aluminum or just wire is bribed in one of the car's bottom doors. This strip connects the body and ground of the car (Figure 2)
3. During the winter period, it is very difficult to control the hair, it is disobedient, traumatic and clings to the clothes when it is taken off (Figure 3).



Figure 1



Figure 2



Figure 3

By observing these photos and hearing the above facts, the teacher asked questions about thinking:

1. What is the phenomenon here? (Electricity, static electricity, accumulating electricity on non-conductive materials, etc.)
2. Why do we want to eliminate this effect? (there is a danger of getting a strong and painful discharge of electric current if the materials ignite the spark, a fire can occur, a person can be frightened, etc.)
3. Why does static charge occur? (Bodies interacting due to friction or rotation due to sudden temperature differences, exposure to radiation, cutting or splitting of bodies)
4. Tell us about your experience of electricization using your life experience. What steps have you taken to protect yourself?

Students are given the opportunity to assess what they know from the topic in question, which gives students an additional incentive to form their own goals and motives.

Before starting to work with text, students are introduced to introductory and meaningful reading methods.

Students are introduced to introductory and meaningful reading techniques.

- *Introductory reading:*
 - Reading the text with paragraphs, taking note of nouns, first and last sentence of each paragraph.
 - Read the information out of your customizable badges, such as, ? – Don't Understand, ! – interesting, ✓ – I already knew it, etc.
- *Reading:*
 - Reflect on the text. Separate the most important idea in each paragraph. Check it (in a different color, underline, brackets, etc.)
 - Think about what the thought of is in one paragraph and another.
 - Think of problematic issues when reading a paragraph (or full text)
 - Make a text plan, a graphical chart, a cluster, or another convenient schema for you to see the links between the parts.
 - You can prepare a second text using the main thoughts of the original text.

- *Interactive reading:*
 - Sharing read information in a group;
 - Formulation and presentation of questions;
 - Reflection of text through the observations of other students;
 - Evaluation, self-assessment;
 - Public presentation

Pupils read the text individually and fill in the table using contract signs.

The text below is analyzed.

TEXT: How to reduce the effect of electricization?

Electrification is a phenomenon associated with the interaction of two bodies (i.e., friction) and the exchange of electrified particles (electrons). In some materials, the electrons of their constituent atoms are very strongly attached to the nuclei (the force of interaction between positively and negatively electrified bodies), while in others they are weaker. Atoms of different species (and, at the same time, different sizes) have different electron interaction with the nucleus. Thus, when two different types of materials interact, the electrons jump from one material to another, igniting it electronically, and the electrons left in the electrode are positively energized because the loss of electrons does not compensate for the positive charge. Such electrification will always take place in the interaction of two bodies, for example a hair comb, car / person with the surrounding air, etc. However, we would only notice the electrification of the bodies of those who are reliably isolated from the Earth. – Sometimes, however, electricity shifts away from devices that, at first glance, seem innocent – like a metal tap.

Metal (electric conductor) plumbing pipes under the ground. Thus, the potential of the pipes is always equal to the potential of the Earth, or, in other words, any strain on the tap will drain into the Earth and the electric current will flow through the pipe until the electrical potential of the tap touches the potential of the Earth / Water tap. Note: If the plumbing pipes are plastic (non-conducting material), there will be no electrical discharge.

The surface of the human skin (an electrically impervious layer consisting of squamous skin cells), interacting with air (an electrically impervious material), as an electric. When a metal tap is touched, the accumulated charge on the surface of the human body will flow to the Earth. So a person will experience short-term electric discharge, i.e. the electric current will flow until the potentials of the human body surface and Earth are equal. The surfaces of bodies can be electrically energized not only by friction when they interact with the environment. This may also be due to poor earthing of electrical appliances. In one hand, we touch a metal body with one hand, an improperly grounded washing machine, and the other hand, we tap the water tap into which the (metal pipe) gets water. Then a washing machine with a higher electrical potential will generate an electric voltage, with respect to Earth, and a human body connecting both unevenly energized objects will begin to flow with a long-lasting electric current that can produce sad consequences.

Why do people who are in the same room turn electricity differently? Some are obstructed daily, for others – never. – There may be many reasons. Most often, electrification manifests itself in relation to the potential of the Earth. So when you stand on the ground barefoot you will never feel an electrical discharge touching a grounded water tap. If you wear footwear with an electrical-impermeable sole, you will keep the accumulated electrical charge on the skin longer. So when you touch the Earth, you will feel a stronger or weaker electrical discharge. The reason is that your body is insulated from the Earth, so that the accumulated load in contact with the Earth will leak to Earth.

Human body electrification can be enhanced by clothes. Many synthetic clothes are very quick to electrify, losing or connecting electrons from the surrounding environment. Electric clothes cling to the human body because the body, at the same time, is energized by the charge of the opposite sign, which leads to the pulling force (adherence). Due to the deformation of the clothes, they can be electrically unevenly t. y. one part of the garment may be electrically energized with respect to the other part of the garment, accumulating opposing markings. The garment itself will then sparkle by deforming it (i.e., wearing clothes, bending, etc.).

The synthesis of synthetic garment can be easily verified by completely unwinding or dressing it in darkness. Sometimes it even shines, from electric discharge. Of course, this spark of clothing can become the cause of the fire, especially if the electrical discharge occurs in a flammable environment (or, in other words, in the presence of combustible materials with low heat capacity). – In which season do these discharges increase? It all depends on the air dryness? – Yes. This is true. The drier the air, the less it passes through. Thus, dry air will more strongly energize the moving objects. Ex. The car's body is heavily energized during the summer, only due to the drier weather of the season. As the temperature rises, the humidity decreases, i. the air is "dry" and the discharges increase. Ex. Car body, insulated (with rubber wheels) from the Earth's surface, after a longer trip, as an electric. Touching the body of a car can cause unpleasant electrical discharge. The discomfort is reduced at the rear of the car, at the rear bumper, usually by a metallic rubber strap, which, when the car stops, fits to the Earth. The tape accumulates all the excess electricity in the car body into the Earth.

In an open space (e.g. outdoors, leaving the car and taking things out of the trunk, etc.), it is also possible to avoid an unpleasant electrical discharge even if the rear bumper of the car without a metallic rubber strip. Knowing that an electrical discharge is an electrical gap between the bodies that have accumulated different loads, the electrical breakdown (i.e., a strong electric field ionizes the gas between adjacent differently energized objects during electrical breakdown). The electrified particles generated during the gas ionization process move at high speed and hit other particles to heat not only the gas molecules on the way (in the case of the Volt arc a blurry blue glow is observed), but also the parts of the converging bodies, which spark the sparks), need to get out of the car, its casing door or other. Touch the metal parts not with your fingers or palms, as is usually the case, but with a metal key on the car (or other metal object), squeezing it firmly with your fingers behind the metal key. The electrical discharge will then form between the body of the car and the end of the key, and the owner of the car will not feel the impact of the electric discharge at all or will be very weak.

Vilnius Gedimino technical university
prof. dr. Artūras Jukna

Tools and methods for creative and critical thinking

Next, the students fill in the table, briefly and concisely write the main thoughts and mark it as a sign. The role of the teacher in the task and presentation: is to observe the pupils, direct them in the right direction (specifying the meaning, distinguishing the most important things, etc.).

Creative / Critical Thinking Products / Results

Trumpas konspektas	AI-ready knew this	New	I thought differ- ently	I didn't understand, I had to clarify	My thoughts
Electrification mechanism (short synopsis)	√				
Short-term electric discharge, t. y. the electric current will flow until the potential of the human body surface and Earth is equal (even if it is a metal crane?)				?	
Some are obstructed daily, for others – never. Reasons explained: earthing, clothes, dry weather		±			
Described are ways to avoid the charge of electricity in buildings (humidity, metals, contact with earth, etc.)			–		

- After the table is filled, discussion in groups, discussion, public presentation of the work takes place. The teacher summarizes the results of the table by asking the following questions:
 - What did you find out about ...?
 - What did you read about the electrification and ways to avoid it?
 - Read the most interesting places in the text. How interesting is the information you find interesting?
 - Read the highlighted part of the text. Find words in sentences that ...
 - Tell us why you need to take note of the ways to protect yourself from electric shock?
 - Are the features of the electrified body well absorbed? List it.
 - What are the ways of electrification?

If the pupil completes their statements after hearing the conclusions of the other students, they write them down in their table.

Pupils evaluate self-test sentences.

1. Mostly the bodies are electrically energized when ... (wears wool and synthetic garments, wear rubber footwear, use plastic items, dry air, etc.)
2. Bodies are energized when (acquires positive or negative charge)
3. Antistatic works like this. Sprayed liquid ...
4. The bodies are energized when ...
5. Laidi strip is connected between the car and the asphalt for the purpose
6. The airframe warms up because ...
7. Write three rules to avoid electric discharge.

Create Scaffolding

1. Helping students identify the key idea in each paragraph.
2. Go deeper into the words "I thought differently".
3. When writing a synopsis from each paragraph, ask first to tell your thoughts. It is worth doing it quietly (tells the ear) without disturbing others.
4. To support pupils' small victories with appropriate words and phrases. Demonstrate the pride and charm that they can. Encourage them.
5. Ask them to show what feelings they have experienced when they were hit by an electric discharge.
6. Which thoughts do you agree with? Why?

Creating an educational environment.

How will the educational environment be prepared? The environment is traditional, physics or any other cabinet.

Evaluation (what will be the evidence that pupils and teachers are satisfied with the results?)

- Performance self-assessment criteria. Criteria for assessing learning outcomes (products).
- Observing pupils' work, reading and analyzing the presented text, or applying introductory and meaningful reading techniques.
- Observing and adjusting pupils' work when filling in a table and applying the INSERT method. Evaluate how many pupils and what they have labeled as "I don't understand" and "I already knew".
- Evaluate what arguments (theoretical or practical) the students used in the discussion about their own table.

- Evaluating whether they were able to listen to each other during the discussion, to show respect to others.
- Approximately 95% of pupils have correctly completed unfinished sentences.
- Being able to answer all your questions and suggest ways to eliminate your electricity when evaluating the entire content of the text.

*Authors: Justina Naujokaitienė, Larisa Gražienė
Kaunas Saule Gymnasium*

Topic: EXPERT ANALYSIS: WAYS TO CHANGE INTERNAL ENERGY FROM SIX SIDES

Target audience: 14–15 years old age group, Grade 9. **Subjects:** Physics.

What is the purpose of the task? Work in groups using the Bloom Cube to create a holistic (multi-dimensional) view of different ways of changing internal energy by formulating and answering questions.

What competencies will we develop?

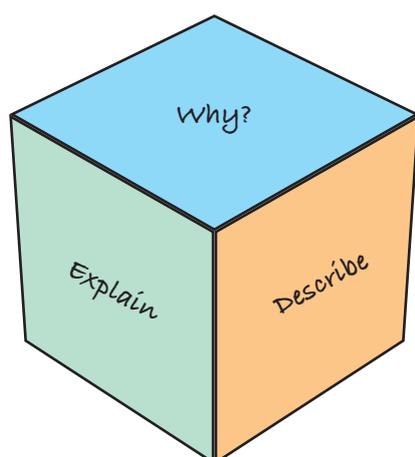
- ability to recall / reproduce previously learned facts, terms and concepts,
- ability to use knowledge in a new situation,
- ability to discern logical, phenomenal, component relationships,
- ability to express and defend one's opinion, to reason and to analyze information,
- ability to formulate questions,
- the ability to extract elements from multiple sources and combine them into a new whole, to create a unique, original word product about the phenomenon,
- ability to work in groups.

How will creative and / or critical activities educate students?

The group is given a CUBE. The words written on the side of the cube are: *Describe, Why?, Explain, Suggest, Share, Invent*.

There may be other options. It all depends on the subject and type of lesson. For example, *Describe* (describe, present, name), *Compare* (What's similar? What's different?), *Analyze* (What's made of? What's the composition, what parts?), *Customize* (Where can you use? What can you do?), "For–Against" (present good and bad), *Improve* (What would you change (discard, add)?

The involute of cube is given in Annex 1.



Depending on the class level, there are several options for using CUBE:

Option 1: Questions are formulated by the teacher. This shows an example of how to "work" with a cube.

Option 2: The questions are formulated by the pupils themselves, in groups, and the answers are analyzed.

Option 3: The cube is thrown and each member of the group comes up with his or her own question.

Each group of students chooses the (randomly) analyzed way of changing the internal energy: during work (decrease, increase), thermal conductivity, convection, radiation.

Next, students formulate 6 questions based on the CUBE references provided. For help, the following words and verbs may appear on the board:

Describe	Why?	Customize	Analyze	For-against	Improve
<ul style="list-style-type: none"> • Define • Describe • Recognize • List • Name • Find in text • Describe • Show • Depict • Set out 	<ul style="list-style-type: none"> • Why? • Why? • How much? • For what? 	<ul style="list-style-type: none"> • Customize • Implement • To show • To illustrate • To solve • Perform • To use • Exercise • To make sketches • To write • To compose 	<ul style="list-style-type: none"> • Interpret • Give an example • Find in the text • To translate • To paraphrase • To elect • To recognize • To classify • To mark • To write down the names • Specify • Compare • To summarize 	<ul style="list-style-type: none"> • What do you feel ...? • Why do you think? • How do you rate ...? • How to check ...? • What hypothesis is raised ...? • Maybe you can predict ... • If an experiment were needed ... • What do you decide on ...? • What conclusion do you draw when ...? 	<ul style="list-style-type: none"> • Create • Invent • Conclude • Compose • Formulate a solution • Prepare • To do • Anticipate • Scheduled • Connect • Link • Expand • Spread

The questions are written down on a sheet and forwarded to another group. As a collaboration, students discuss the answers and present them aloud to the whole class. The group that prepared these questions rated the group as answering, supplementing, or suggesting their own.

What are the teacher's expectations for the students (or what will be the roles of the students)?

This method is very suitable for generalization. The lesson is intended to summarize the topic *"Inner energy and ways to change it"*.

Within each group, students independently (or in a group study) examine the individual phenomenon, ask questions, and explore the details of the phenomenon in the *"Describe"* and *"Explanation"* stages. Uses knowledge acquired earlier. Learn to formulate questions using the verbs in the table.

Investigates facts, evidence and collects information about a phenomenon from various sources (textbook, notes, internet, etc.).

As you formulate questions in the Share phase, you learn how to distinguish facts from opinions.

Analyzes ideas, suggestions, and assumptions. This is especially the case in the Offer and Think phases.

Trying to learn how to correctly describe a problem and reformulate it.

Learns to simplify questions and explanations, leaving the essence in the Explanation and Why?

Listens to the interpretation of others, critically evaluates their questions and answers.

When explaining, avoids emotions, learns to control himself.

Thinks abnormally, does not follow patterns.

What is the role of the teacher in the students' task?

Learning resources: textbook, notebooks, mind maps Internet.

Tools and methods for creative and critical thinking

A short survey should be conducted before the summary lesson begins. Any method: "True – False", "Yes – No", "Incomplete sentences", etc. is suitable. We believe that the Bloom Cube method in this lesson would be more appropriate for the question formulation method. This effective method will develop the ability to formulate questions from a previous topic and is very much related to the CUBE method. You have the confidence to deal with the task.

Students are provided with a table with questions and terms in the previous topic. You should ask as many questions as possible using the words and terms of the question.

Questions	Main topics
How?	Thermal movement
What?	Temperature
Where?	Molecular motion
Why?	Temperature scale
How much?	Inner energy
From where?	Mechanical work
What?	Thermal conductivity
Why?	Convection
In what way?	Thermal radiation
How is it related?	Joule
What made up?	Calorie

The lesson aims at the active and conscious work of each student, the unity of language teaching and skill building. The use of this method allows the teacher to differentiate thinking, allowing some students to work on lower and others to work on higher-level issues, improving their skills more effectively.

Bloom CUBE focuses on developing student questioning skills to help develop deeper thinking. This method does not present a skill, but a problem that the learner has to solve on his own, using his knowledge, experience, mindfulness, logic and creative thinking. This approach combines two areas of educational goals – cognitive and emotional:

- systematize and consolidate the previously discussed subjects and apply the knowledge in new conditions;
- respond emotionally to the knowledge and understanding gained;
- apply the knowledge gained in practice, develop personal learning and thinking skills.

Creative / Critical Thinking Products / Outputs – What Will Be Created?

Here is a list of questions and tasks written by one group that studied the phenomenon of "CONVECTION".

- Say without words what is convection? (*Pantomime, acting*) (*Describe*)
- Why do I need to warm the bottom of the pan with water to observe convection? (*Why?*)
- Compare natural and forced convection. (*Explain*)
- It is written in the textbook that convection does not occur under weightless conditions. What would you suggest to run an experiment to prove it. (*Share*)
- How can we balance levers with a lit candle? (*Inventions*)
- Draw a sketch of conventional currents with the heat source in the center of the room. (*Suggest*)

Create a "Scaffold"

Maintain and create positive emotions, success situations, and moments of self-confidence. It's good to use phrases like "You can handle it", "I believe in you", "You can do it", "You see how great you are," "I wouldn't think so."

Creating questions is difficult, so students are provided with help – a table with written verbs or beginning of questions (see above).

Creation of educational environment. How will the educational environment be prepared?

- Traditional environment, physics cabinet or IT cabinet.
- Textbook, notes, Internet. This is a lesson in generalization.
- Bloom's CUBEs.

Evaluation (what will be the evidence that students and teachers are satisfied with the results?)

Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

Students' work is observed and conclusions are formulated. Students are asked to explain what issues or tasks were most difficult for them and why. Because work can be differentiated it is very important to give the floor to the weaker students "Did you understand how this method works? Where can you apply it?"

If you want to get more involved in the topic reflection, you are advised to create a syncope.

Syncope is a concise expression of information and facts that characterize one or another topic. This method is convenient for combining complex information; is a great tool for creative expression.

Landmarks for Syncope Creation:

1. The first line is a description of the subject in one word (usually a noun).
2. Second line – describing the topic in two words (two adjectives).
3. Third line – three words expressing the action of the subject (usually verb forms).
4. The fourth line is a four-word phrase that conveys an impression on the subject.
5. The fifth line is a synonymous word that repeats the essence of the subject.

Syncope created for the convection theme:

CONVECTION
FREE AND FORCED
WARM CURRENT TRANSMISSION
CARRIED IN LIQUIDS AND GASES
HEATING

*Authors: Larisa Gražienė, Justina Naujokaitienė
Kaunas Saule Gymnasium*

Topic: LET'S DISCOVER OURSELVES: VALUES IN MY LIFE

Target audience: 14–15 years old. **Subjects:** Ethics, Psychology, Social education.

Students will develop the following competencies:

- ability to substantiate his arguments with weighty arguments and persuasive motives;
- ability to listen to each other, mutual understanding and respect;
- ability to express and defend your opinion, to base reasoning, to analyze information;
- ability to formulate questions;
- ability to self-assess.

HOTS (higher order thinking task). Teacher's expectations (the role of the students)

Discussion after the film, active reflection on experience.

Questions for pupils:

- Why is it important to have a value proposition?
- How do we see the values of another person?
- What happens when people's value propositions do not match?
- How are our values shaped by cultural experience?

Vizualization

Short clip about values: <https://ethicsunwrapped.utexas.edu/glossary/values>

Problem-based learning process

Students are provided with a table with a list of values and asked to collect the criteria that are relevant to them.

The criteria according to which I rank my values:

1. _____
2. _____
3. _____
4. _____
5. _____

Life Value

Accountability	Efficiency	Honor	Restraint
Accomplishment	Empathy	Humility	Respect
Authenticity	Enjoyment	Independence	Resourcefulness
Acheivement	Enthuasiasm	Ideals	Resiliance
Adventure	Ethics	Ingenuity	Satisfaction
Affection	Equality	Insight	Security
Beauty	Exploration	Intellect	Self-actualization
Belonging	Fairness	Intuition	Selflessness
Balance	Faith	Joy	Service
Career	Family	Justice	Serenity
Caring	Fidelity	Leadership	Stability
Consciousness	Fitness	Love	Spontaneity
Community	Focus	Loyalty	Strength
Compassion	Freedom	Mastery	Teamwork
Connection	Fun	Merit	Truth
Challenge	Generosity	Money	Temperance
Commitment	Goals	Nature	Thankfulness
Consistency	Goodness	Openness	Tolerance
Communication	Growth	Order	Tradition
Creativity	Hard work	Optimism	Trust
Competition	Health	Opportunity	Understanding
Dependability	Helping others	Purpose	Uniqueness
Determination	honesty	Preparation	Vision
Discipline	Hope	Prudence	Vitality
Diversity	Healing	Reliability	

Structure (graphic organizers)

- *Introduction:*
 - Discussing with pupils what we will do in the lesson, why this topic is important and should be interesting to us. Students are told that the art of raising questions is meant for their higher skills development. Thae rules of the lesson are reminiscent of restoring the safe atmosphere of the lesson.
 - The task of the lesson is announced and it is discussed what will be needed to achieve the desired goal. Student activity is discussed.
- *The main part:*
 - Short clip about values is watched and discussed.
 - Ratings of the values are made.
 - The active game is played.
 - Creating a mind map.
- *Final part:*
 - Students present their mind maps in groups.
 - Together we are discussing the lessons learned and experience in the lesson.
 - Mind maps are displayed in the classroom.

Atractiveness

Pupils reflect on their life experiences, learn to accept another opinion, discuss.

The teacher role is like coordinator or assistant in the activities, as well as the questions that prompt thinking at the right time. Planned activities for pupils are visually appealing, fast changing, stimulating active engagement.

Collaboration

Work in groups, discussions.

In pairs and / or groups, they compare mind maps of their own values, find out what is common and what is different, if there is a different cultural experience in the classroom, and discuss why and how our values are shaped by cultural experience.

Students can find the „matches“ of people (celebrities / people in some area, etc.) that best suit their „map“ and / or create a vision of a future life based on these values (what life is waiting for / expecting – a picture, a vision).

Reflection

Teacher together with students discusses the work in the lesson, encouraging everyone to get involved and assume responsibility for the work. Reflecting on the impact of the work on lesson? What does this have to do with my life? What is in it for me? What should I do everyday in keeping up with the desired / available vibes? How to achieve certain values? Is value as an aspiration?

Evaluation criterias of creative thinking tasks (students, or teachers)

Created mind maps of the values.

An imaginary / striving scenario of life is created based on the mind map.

Use different learning resources (books, tutorials, journals ...).

Work in groups/pairs.



*Authors: Justina Naujokaitienė, Larisa Gražienė
Kaunas Saule Gymnasium*

Topic: CREATIVE RESEARCH WORK. HOW TO MEASURE BODY WEIGHT WITH A THERMOMETER?

Target audience: 14–15 years old age group, Grade 9. **Subjects:** Physics.

Aims: in experimentation, find the way to determine the mass of a glass without scales.

Students will develop the following competencies:

- ability to remember / reproduce previously learned facts, terms, and concepts;
- ability to use knowledge in a new situation;
- the ability to see the logical, descriptive, part-like relationships;
- ability to express and defend one's opinion, reasoning, analyze information;
- ability to formulate questions;
- the ability to select items from multiple sources and merge them into a new whole, create a unique, original word product about the phenomenon;
- ability to work in groups.

How do creative and / or critical activities educate students?

In the lesson, some invisible "frames" are created, three stages of critical thinking model realization – awakening, understanding of meaning, reflection.

In the awakening and engagement stage, students are trained to receive and understand information in an encrypted task.

Two students argued about ways to measure the mass. One says the way can only be one – weighed and the other claimed that there could be many ways. One of them is to measure the mass of the thermometer. There is very little to do: the hot water and the thermometer of the vessel you need to know. You will also need specific heat tables for the materials.
Challenge – measure the body weight indirectly.

In the second step, the perception of meaning, the pupils reflect on ways to measure temperature. Here will reveal their ability to apply knowledge in a new situation, practical skills: to anticipate the course of the research, to develop hypotheses, to select tools, etc.

Reflection or Reflection is a phase of the lesson in which the child recalls the ideas and difficulties he has encountered, and the meanings that he perceives when he asks, interprets, applies, then argues with the partner of the bench and understands the essence, adds new experience by sharing it. with others.

What is The role of the teacher in the task and presentation: in the task of the students?

- *Learning Sources:* a textbook, tables.
- *Thinking questions:*
 - When is the thermal balance equation written? What can you learn from it?
 - How do you calculate the amount of heat you give to a glass?
 - What sizes do you need to know to find a glass mass?
 - What additional domains should I look for?
 - Illustration (drawings, diagram, picture of your experiment)
 - Determine the reason why the glass mass may not coincide indirectly with the mass measured by the scales?

Tools and methods for creative and critical thinking

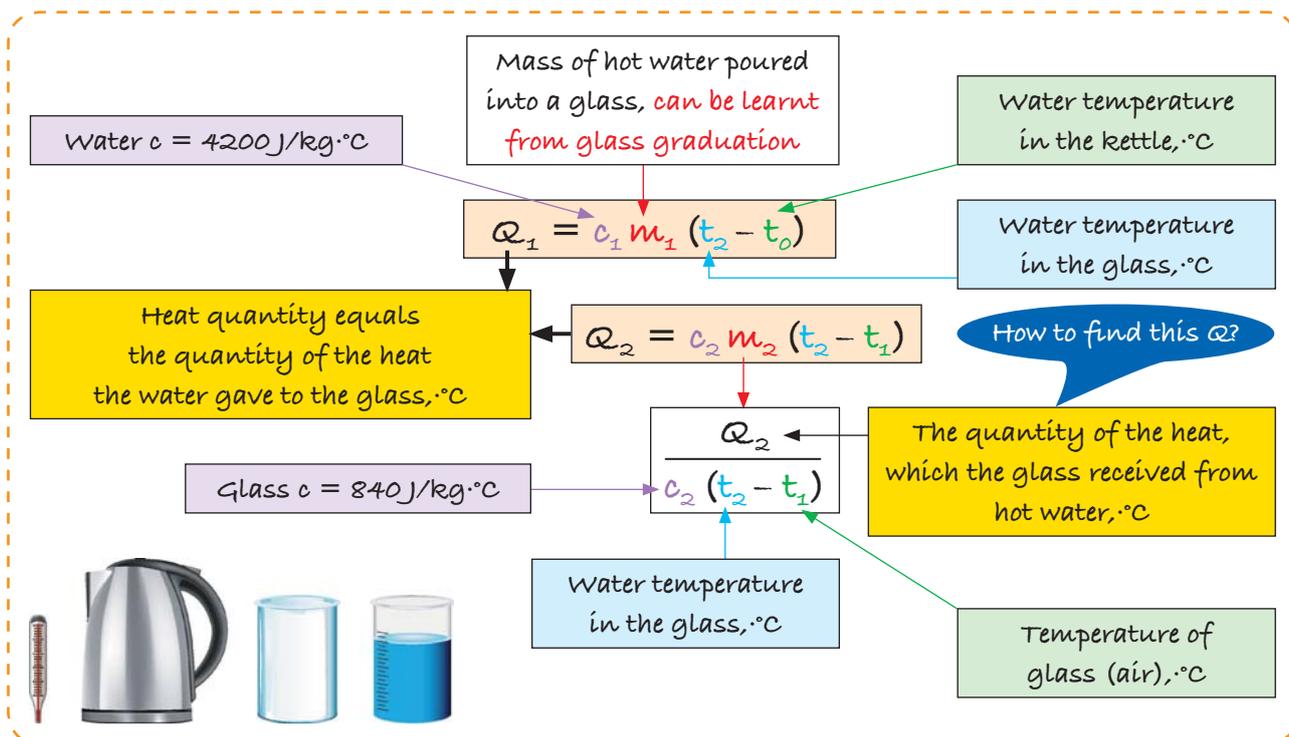
1. "Yes" – "No" with extension. The following thinking questions are given to this topic:

No	Statement	Yes	No	Explanation
1.	Does Body Mass Include In The Heat Quantity Formula?	+		Formula $Q = cm(t_2 - t_1)$ mass is
2.	Will the thermometer readings differ when we measure the hot water temperature in the kettle and pour it into a glass?	+		The glass thermometer will show a lower temperature because some of the heat was transferred to the glass.
3.	Is it necessary to have a glass in ml?	+		You need to know the weight of the water you add.
4.	Do you need to know the density of glass?		+	It is not necessary because the formula does not include density.
5.	Do you need to know the specific heat of glass?	+		Because the formula contains the specific heat.
6.	Place the thermometer once in the glass when setting the glass mass?		+	Place the thermometer in the beaker twice, measuring the air temperature and measuring the temperature

2. Repeatedly, students come to the conclusion that they will calculate the glass mass if they know three temperatures: in the air, in a hot water kettle and in a glass of water after a settled thermal balance. They also need to know the glass volume and the specific heat of the glass.
3. *The visual way of thinking* continues. Using your own support signals, images, or formulas, a composite experiment scheme and a mass calculation path. We constantly monitor and help you at the right moment.
4. *Not so much the study itself, how much reflection is it about how to do it and to calculate the weight of a glass.*

Creative / Critical Thinking Products / Results

Pupils create their own Mind Map.



Creating "scaffolding" – focuses on the right stages of learning outcomes.

1. Remember how the amount of heat the body receives or loses by heat transfer is calculated.
2. The student worksheets show the tools they used to construct the study. Pupils are asked to make a sequence of actions.
3. Where does the glass we weigh we get heat?
4. Remember the laboratory work and its conclusions when calculating the specific heat of a metal roll. What amount of heat did we compare?
5. Why is the result not as accurate as weighing a glass with scales?
6. One pair of pupils perform a test and record the measured values on the board.

Phraseology. Body mass can also be measured in other ways, such as a spring pendulum or interacting with an unknown mass body with other bodies you know. Therefore, it would be worthwhile for students to show these experiments.

- What could this badge mean in our work?
 - "Measure everything that can be measured and what cannot be measured to measure."
G. Galileo
 - "If you can't measure anything, you can't control it." *The author is unknown*

Teacher's expectations (the role of the students)?

- Students remember independently what sizes they need to know in order to calculate the mass from the formula of heat quantity.
- Pupils work in pairs to discuss their action plan, find out, predict, and predict the course of the research, try, mistake, and debate and discovery methods.
- Higher levels of cognition arise: synthesis (construction, combination, generalization, and hypothesis) and evaluation (decision making, opinion formation, reasoned criticism).
- Self-questions and plans to calculate body weight.
- Draw a logical diagram of how this will be implemented. *Measure the room temperature at which the glass was measured, the temperature of the hot water, the temperature that settled by adding a full glass of water. Knowing the glass volume, the specific heat of the glass, and the application of the thermal balance equation, the glass mass is calculated.*
- The lesson aims to eliminate The role of the teacher in the task and presentation: as the sole source of information.
- The following questions apply to reflection:
 - Questions to clarify the process of thinking in the course of the work being done (Can you refine your ideas on the application of the thermal balance equation? Did you find the path to the logical scheme, the Mind Map, and how did the idea of the experiment proceed?)
 - Questions for proof (In what ways can we prove that the way to determine the mass is correct. What do we have to rely on? What can we disregard in this experiment? What was the hardest way to find the mass determination using the thermal balance equation?)
- Pupils rethink what measures should be chosen for the experiment and what sizes need to be known.
- Perform the necessary measurements, calculate the weight of the glass indirectly, and specify whether the masses are equal to the mass by weighing the glass.

Evaluation (what will be the evidence that pupils and teachers are satisfied with the results?)

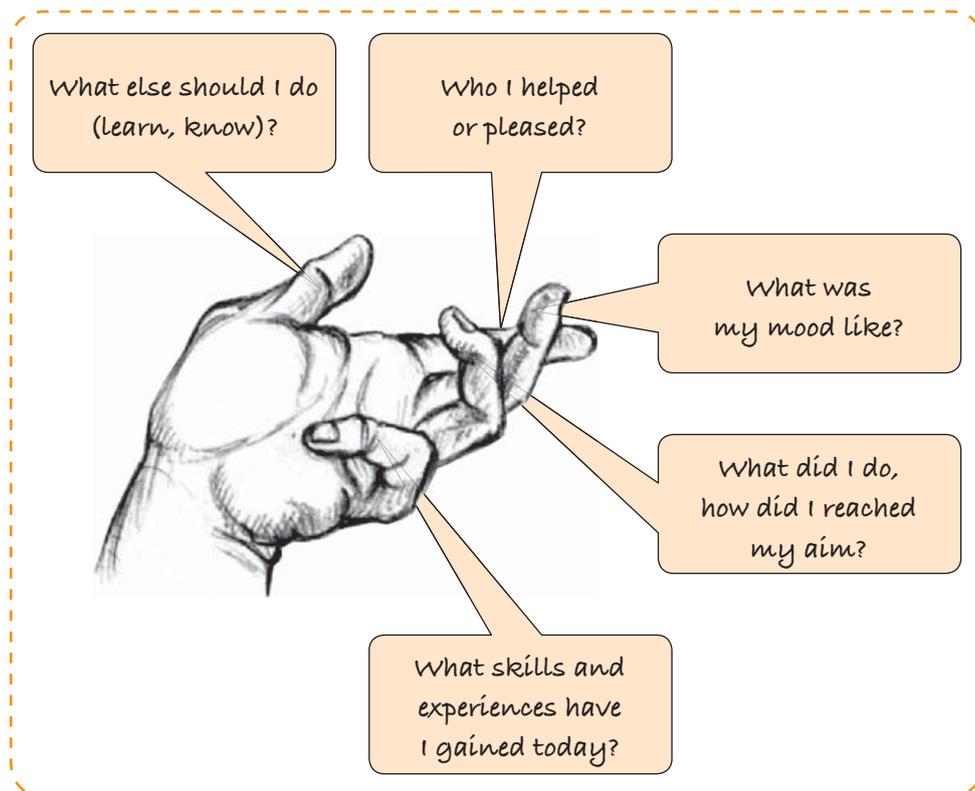
Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

Observing pupils' work, drawing conclusions on the use of thinking skills. Pupils are asked to tell how they worked, how they chose the path, what they thought about their choice of path. Their actions are analyzed as a drawing map of thinking, which connections are most difficult for them. Looking at humor with humor When students fail, the pupils ask for help from the teacher. The teacher only directs.

The most important questions for those who did the work without help: "How did you succeed? What was the most important point of reference in shaping the mind map? Which?"

The most important questions for those who helped you, "Why didn't you do it yourself?"

At the end, use the **5-finger method** to reflect on the lesson.



Creating an educational environment. How will the educational environment be prepared?

- The environment can be traditional and non-traditional. It all depends on what kind of activity is organized: lesson or extracurricular.
- Measures required for the test: thermometers graduated in glass, hot water.

Involving parents and other partners in the educational process

Indirect measurement is a common phenomenon in everyday life, so parents are asked to tell students about common cases: length measurement versus the standard, force measurement, knowing the mass, determining the speed of the car and so on. Pupils' achievement in this work will be improved if parents discuss with students the progress and expected results of this lab or otherwise help their children.

*Authors: Larisa Gražienė, Justina Naujokaitienė,
Kaunas Saule Gymnasium*

Topic: INDIVIDUAL CREATIVE RESEARCH “FIND THE WAY HOW TO MEASURE MAGNIFIER GLASS”

Target audience: 15–16 years old student. **Subjects:** Physics.

Aims: to find the way(s) to measure magnifier glass.

Students will develop the following Students will develop the following competences:

- the ability to apply knowledge about lens enhancement in a new situation,
- exploration, problem-solving skills,
- self-reflection, originality,
- ability to make a decision,
- research activities,
- the ability to plan and reflect on the learning process and outcomes.

Creative and critical activities for development of pupils

In the lesson will be created “invisible frames” for three steps of critical thinking model: awakening, sense of comprehension, reflection.

In the awakening, sense of comprehension steps pupils are prepared to receive and understand information. For that the famous character in the literature Sherlock Holms is used:

Sherlock Holmes, looking for criminals, used one tool and method. What was that? (the pupils speculates that the method is a deduction and the tool is a loupe).

In search of a proper magnifying glass (10x magnification), Sherlock, along with Dr. Watson, arrived at a small optical device store. After reviewing some examples, he has chosen the most suitable.

"How did you do that, Holmes?" Asked Watson

"Elementary, Watson. You just need to.... "

For the sense of comprehension step pupils get a creative task: *to think about the way to measure augmentation of magnifying glass.* In this step their competences of mating research are revealed.

In the third step – reflection – pupils evaluate their ideas, difficulties, they had, questions themselves and cooperates with other students.

Teacher’s expectations (the role of the students)

- Students independently remember what sizes they need to know in order to determine the magnification of the lupus in search of similarity to the closure lens.
- Students work in pairs discussing their action plan, explaining, predicting, and predicting the course of the research, trying to be mistaken, prevailing discussions and discovery methods.
- The higher levels of cognition are developing: synthesis (construction, combination, synthesis, and hypothesis raising) and assessment (decision making, opinion formation, reasoned criticism).
- Self-raised questions and experimenting with them.
- The lesson aims to dispel The role of the teacher in the task and presentation: as the sole source of information.
- The following issues apply to reflexion:
 - Questions that are intended to refine the thinking process in the course of the work you are doing. Can you refine your thoughts about the inventive way to increase the magnifying glass? Has your guess proved to be true? How did the idea of the experiment procedure arise?

- Issues for evidence (How can we prove that the experiment will allow you to identify a magnifying glass? What makes you doubtful? What could be a solid proof? What was the hardest thing to do when planning an experiment?)
- Answering questions that show the attitude and perspective (Do you see another way to set up an increase in the magnifier? Do you have alternatives? What questions did you raise yourself that were helpful in planning an experiment?)
- Pupils rethink their activities.
- Will they create different ways to determine the magnifying lupus and present them? Can they explain to *Watson* how to find the needed magnifying glass?

Teachers role

Learning resources: textbook, Internet.

Questions for thinking:

- How these two tools are similar: magnifying glass and closing lens?
- What sizes should I know to find magnification?
- What tools should be chosen?
- In what way, can we verify that this method is correct (false)?
- Illustrate (drawings, schematics, picture of your experiment)
- Say a reason why we can fail?

Tools and methods:

1. "Yes – No" questions: :

No	Proposition	Yes	No
1.	Magnifier is a degenerative lens.		
2.	Magnifier creates an imaginary image of the object		
3.	Magnification is not constant		
4.	Increasing the lens is determined by knowing the height of the subject and the image		
5.	The magnifier is far from the object's distance to the best viewing distance		
6.	Lupa focal length is larger than the loupe which is thicker		
7.	Magnifier creates an unformed image of an item		
8.	The item against the loupe is placed at a distance greater than 2F		
9.	The magnitude of the increase is higher in the loupe.		
10.	Put the item between 5 cm in front of the loupe. Is the focal length of the loupe 10 cm?		

2. While repeating, students comes to a conclusion that **h** (height of object), **H** (image height), **f** (distance from loupe to image) and **d** (distance from object to loupe) are required to determine the magnification.
3. The **problem solving method** is used. Do students think critically that they consciously control what they think and how they create their own way of setting up a lupus? We are observing whether they devote time to deliberate reflection on the questions: "Why?", "In what way?".

Results of creative critical thinking

From pupils work:

- "You must keep the object under observation at a distance so that the image is at the best viewing distance ($f = 25$ cm). Knowing this distance and measuring the distance from the object to the loupe, according to the formula $\Gamma = f / d$, we calculate the increase".
- "You need to put the ruler on a sheet with "boxes". To dance Watch the loupe and use the ruler next to it to mark it or the side of the window height when looking over the loupe. Knowing that one box is 0.5 cm and we measured the distance that we marked in the ruler, we calculate the increase according to the formula $\Gamma = H / h$ ".
- "You need to direct the loupe to the light source and collect all the rays to one point. We can measure the distance from that point to the loupe. So let's find the focal point of the loupe. This distance is equal to the magnitude of the loupe from the image. Since the loupe creates an imaginary image, d can be found from the formula: $\frac{1}{F} = \frac{1}{d} - \frac{1}{f}$. Next we calculate an increase in the magnifier".

Creating framework for students by asking them:

1. Remember how you can calculate the increase?
2. Why do we manage to see an enlarged image, although the image is imaginative?
3. Recall the findings of laboratory work when you had an expanding lens, did you see the candle flashing on the screen? Why are you seeing now?
4. Changing the loupe position changes the image size, brightness? Why is this happening?
5. Fraziologism "*Look for a woman*". This saying is so known that most people even know how to pronounce it in the original language, in French – "*Cherchez la femme*" ("*sherry lia fam*"). Aleksander Dium-father, the novel "*The Mohicans of Paris*", was published in the world. The message in this novel was consistently consumed by one follower, bearing in mind that all crimes are the same or otherwise, because of women. Who in this experiment is "woman"?
6. Some jokes about Sherlock and Watson are told.

Creating educational surroundings

- The environment can be traditional and unconventional. It depends on what activities are organized: formal – lessons or informal – a group.
- The study requires a variety of loupes, rulers, and others that will look very in need of your pupils (small items, exercise books, etc.).
This research is simple, but requires some skills and abilities to apply knowledge in a non-standard situation.

Evaluation

Observation of students' work, drawing conclusions on how thinking skills are used. Students are asked to tell about their working process, what paths they were choosing, what they were thinking about choosing this method. Their actions are analyzed, as time loupes, at what distance from the eye, what does not succeed. Humor is looking at failures, tracking how many times you try. When it comes to doing the job, she tells the teacher. Get his approval. The teacher directs the couple to help others. They become teachers. It does not leave trained students until they can do it.

The most important questions for those who discovered the way themselves: "How can you prove that your path is right?", "Why did you fail at the beginning?", "How did you find the right path (accidentally or deliberately)?"

The most important questions for those who helped: "Why you did not do it yourself?", "Can you explain to others how to increase the magnifying glass?", "Which way did you enjoy the most and why?"

*Authors: Larisa Gražienė, Justina Naujokaitienė,
Kaunas Saule Gymnasium*

Topic: BULLYING – AT SCHOOL AND IN THE SOCIETY

Target audience: different age groups, in particular case students aged 15–18. **Subjects:** interdisciplinary task combining social studies, psychology, mother tongue and a foreign language for advanced learners.

Aims: scope of interest: bullying at school and in society. Students will learn about bullying: what bullying is, what is needed to have a good social environment and how we can decide what a good environment is, and what it is not.

How will the creative and critical thinking encouraging activity develop the students?

Competencies developed by the students:

- Analysis, synthesis and cooperation.
- Students will learn about bullying: statistics, precautions and everyone's right to good psycho-physical work environment.
- Students will also reflect upon their own behaviour and their own role in bullying situations.

The learners are working in pairs or as a group in the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final set of findings (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students will see different images of social situations (some of them present bullying). They must evaluate all of them and decide whether they can be identified as bullying and why.
- Later they can use any source available to find out definition(s) of bullying, types consequences, precaution means and etc. Students must evaluate sources of information all the time and decide which of them they can rely on and why.
- Students must analyze their own experience with bullying and write three statements why people bully others. This can lead to a discussion as every student experienced bullying either as a victim or bully or bystander. What changes should be made to prevent bullying?

The teacher is a guide and help during the previous stages

- Later, students watch a movie about the subject, for example "Forest Gump", "13 Reason Why", "Chicken Little", "Bully", "Wonder", etc.
- Then the film is stopped before it is over, and students are asked to write a possible ending of the story.
- They read their stories to the rest of the class and then watch the rest of the film to see the "real" ending.
- If the assignment is carried out with an art class, students can also create a poster "Bullying prevention is everyone's responsibility".

The role of the teacher in the task and presentation

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product (for example poster), evaluates the final product (poster or the written texts about the ending of the film) – possible formal evaluation, and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Story writing and a poster can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*
 - Ongoing evaluation: ongoing feedback and support
 - Formal final evaluation (ending of the film): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the written text
 - Formal final evaluation (poster): composition, general impression, originality, content
 - Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.
- *Students*
 - Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do better next time.
- *Teacher and students*
 - Evaluation of the group work.

Topic: NATURAL ENVIRONMENT.

THINK IN A NEW WAY

Target audience: A topic intended for students aged 15–18 but can be adapted to other age groups. **Subjects:** Interdisciplinary task combining social studies, biology, mother tongue or/and a foreign language for advanced learners.

Aims: Scope of interest: people use the environment too much to make their consumption sustainable. How can you reduce your consumption and help improve the environment?

Focus is on describing what sustainable consumption is, what is needed to have a good impact on natural environment in terms of consumption.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- Analysis, synthesis, cooperation.
- Students will learn about natural environment, sustainable development and consumption, carbon dioxide footprint.
- Students will also reflect upon their own habits and their own impact on the natural environment in terms of their own consumption.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final set of findings (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students must pay attention or take part in the initial session on what sustainable development entails (depending on the chosen method: lecture, film or brainstorming). Students are told that we use our environment too intensively and we have to find out how we can influence it in a positive way. We need to think how we can achieve sustainable consumption.
- Students, in pairs or small groups, write down all the ways their consumption influences/uses the environment during a week.

The teacher is a guide and help during the previous stages and summarizes all the suggestions on the white board

- Every student should choose one problem they want to focus on changing. Then the students who share the same interest can make pairs or groups and are going to work out new ideas to save the environment in relation to their chosen problem.
 - Example: Energy consumption; telephone, hairdryers, toothpaste, fuel, food, clothing, or water consumption, etc.
- Each group presents its idea to the rest of the class and jury. They vote for the best/most innovative/most original proposal. The winner gets a reward and the idea or ideas is/are presented to the whole school.
- Students can use the Internet resources to find additional information to work out their set of suggestions for decreasing consumption and environmental footprint. Students must analyze

all the time the quality of the sources of information and evaluate whether they can rely on them or not.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures, film, statistics or having a lecture; presenting the task and asking some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures or a film, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product (set of ideas in a form of a poster), evaluates the final product as a member of the jury (possible formal evaluation), and at the ends he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Teacher also provides the prize(s) for the winners of the best suggestions.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom in the beginning but then (research and brainstorming phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a presentation that will be evaluated (poster, comic strip, film) can be either a school work or a home-work task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*

Ongoing evaluation: ongoing feedback and support

Formal final evaluation (presentation): information content; quality of the language used (grammar, style, vocabulary scope and its precision); composition, general impression, innovativeness, ...

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

- *Students*

Self-evaluation: what I have learnt, will it have influence on my life, how did I work, what can I do better next time?

- *Teacher and students*

Evaluation of the group work.

Topic: CARDIOVASCULAR SYSTEM.

ONE DAY IN THE LIFE OF A RED BLOOD CELL

Target audience: age group 15–18. **Subjects:** cross-curricular task within anatomy and mother tongue or a foreign language for advanced learners.

Aims: scope of interest: cardiovascular system, protection and risk factor.

In this task students will learn about the cardiovascular system and what factors can lead to good or bad blood circulation in your body.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- Analysis, synthesis, cooperation.
- Students will learn about the cardiovascular system and what factors can lead to good or bad blood circulation in your body.
- Students will also reflect upon their own lifestyle and its influence on their health condition.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students will see different images of the cardiovascular system. They can use any source available to find out what this is all about, why the pictures are different, what can influence different conditions of the cardiovascular system (protection and risk factors). Students must evaluate sources of information all the time and decide which of them they can rely on and why.
- Students must analyze their own lifestyle and reason what has a positive or bad impact on the condition of their cardiovascular system. What changes should they make in their lives to maintain good health?

The teacher is a guide and help during the previous stages and then summarizes what the students have found out and possibly gives a lecture which complements their findings about the topic.

- Write the diary to a red blood cell that passes through the body. The title should be "One day in the life of a red blood cell".
- Create a comic strip that illustrates the storytelling.

The last two tasks allow the students recapitulate what they have learnt and let the teacher know where there are possible misunderstandings or gaps in the knowledge.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Story writing and a comic strip can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*

Ongoing evaluation: ongoing feedback and support

Formal final evaluation (final tasks): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the written text

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

- *Students*

Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do better next time?

- *Teacher and students*

Evaluation of the group work.

Topic: MEAT CONSUMPTION AND ITS INFLUENCE ON SOCIETY AND NATURAL ENVIRONMENT

Target audience: age group 15–18. **Subjects:** cross-curricular task within science, social studies, food processing and health subjects and mother tongue or a foreign language for advanced pupils).

Aims: scope of interest: meat production and consumption; nutrition values; question of its influence on the natural environment and human being's health; question of ethics and animals' well-being; increasing awareness of correlation between meat production and environmental questions and animals' well-being.

How will the creative and critical activity develop the students?

Students will develop the following competencies: analysis, synthesis, cooperation; knowledge about the nutrition and environmental aspects of meat consumption. Students will learn about the meat consumption in general and analyze their own nutrition habits. They will also reflect upon its influence on their health condition. Students have to think/research how our meat consumption, thus production, influences natural environment and animals' well-being.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students will see a diagram of meat consumption. They can use any source available to find out more facts about this. Students must evaluate sources of information all the time and decide which of them they can rely on and why. The introduction of the topic can arise a lot of discussion already at this moment (vegetarians vs vegans vs "carnivorous")
- They should also find information about the nutrition values of different types of meat and search for dieticians and doctors' suggestions for the weekly consumption of meat. Why are the suggestions so? Why should we limit the meat amount in our diet?
- Later, they will make a survey about eating habits among fellow students or/and school personnel. Students must analyze the outcome of the survey and present it in a form of graphs and present them in groups.
- Next step is to find information about well-being of animals bred for meat and possible influence of meat production on the natural environment.

The teacher is a guide and help during the previous stages and then summarizes what the students have found out and initiates a discussion about it and tones it when needed (students may get very agitated by the topic).

- Using all the information gathered during the classes create a brochure informing why it is advisable to limit the meat intake.
- Create a weekly menu plan with recipes for dishes that limit the amount of meat in the diet but assure enough source of protein.

The last two tasks allow the students recapitulate what they have got to know. It will let them understand that changes in their own eating habits can also have an impact on their health, and subsequently on meat production and well-being of animals bred for meat.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a brochure and a week menu plan can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*

Ongoing evaluation: ongoing feedback and support

Formal final evaluation (final tasks): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the written text.

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

- *Students*

Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do it better next time.

- *Teacher and students*

Evaluation of the group work.

Topic: HEALING THROUGH NUTRITION

Target audience: age group 15–18. **Subjects:** cross-curricular task within health and care subjects and mother tongue or a foreign language for advanced pupils.

Aims: scope of interest: various common diseases, symptoms which characterize the disease, how to live with the disease, and diet guidance in relation to the disease

In this task students will learn about common diseases which can be treated or cured by a proper diet.

How will the creative and critical activity develop the students?

Students will develop the following competencies: analysis, synthesis, cooperation. Students will learn about a few diseases related to nutrition and in what way a proper diet and medication can help to cure or treat the condition or illness. They will also reflect upon their own lifestyle and its influence on their health condition.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students are divided in groups and each group draw a card with a name of one disease related to nutrition. They must find factual knowledge about the disease – they must be critical to their sources of the information. They must also find facts about dietary suggestions for people with this disease.

The teacher is a guide and help during the previous stages and then summarizes what the students have found out and possibly gives a lecture which complements their findings about the topic. The teacher helps the students learn more about the subject (conversation, suggestion for certain sources).

- Gather the knowledge and create a brochure with facts and pictures aimed at people suffering from a disease.

Last task let the students recapitulate what they have learnt and lets the teacher know where there are possible misunderstandings or gaps in knowledge.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by making a list of illnesses, showing some pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a brochure/leaflet can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*
Ongoing evaluation: ongoing feedback and support
Formal final evaluation (final tasks): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the written text
Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.
- *Students*
Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do better next time?
- *Teacher and students*
Evaluation of the group work.

Topic: LANGUAGE DEVELOPMENT. WHY AND HOW DOES THE NORWEGIAN LANGUAGE DIFFER FROM A NEIGHBORING LANGUAGE? SIMILARITIES AND DIFFERENCES.

Target audience: age of group 15–18. **Subjects:** cross-curricular task within mother tongue, history, geography and one of the neighbouring languages.

Aims: scope of interest: development of the mother tongue and one of the neighboring languages and what factors can lead to differences in languages of neighbour countries. Awareness of constant change of the language and the fact that we are also a part of this change.

How will the creative and critical activity develop the students?

Competencies developed by the students:

- Analysis, synthesis and cooperation.
- Knowledge about own mother tongue, its constant development from the first version of it to the present. Students will learn about the factors that influence changes in the language. They will also reflect upon their own influence on this development.
- The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using examples from their mother tongue and a foreign language (neighbouring land). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).
- Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Study some sentences, vocabulary in two Nordic neighbour languages (Norwegian and one of their own choice) and try to find what the same is and what is different. Students find facts about Old Norse language, and about Norwegian and Icelandic/Danish/Swedish. Later, they create a presentation where they use Venn maps to show similarities and differences between languages. The presentation should also try to explain the reasons for the development from one to a few Nordic languages. Students must evaluate sources of information all the time and decide which of them they can rely on and why.

The teacher is a guide and help during the previous stages and then summarizes what the students have found out and initiates a discussion about it.

The last task (the presentation in the form of Venn diagram) let the students recapitulate what they have got to know. It can let them understand that changes in their own mother tongue and they can also have an impact on these changes.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (mind maps – Venn diagram), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms; students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a Venn diagram and the presentation can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*

Ongoing evaluation: ongoing feedback and support.

Formal final evaluation (final task): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the Venn diagram (?)

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

- *Students*

Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do it better next time?

- *Teacher and students*

Evaluation of the group work.

Topic: HISTORY OF MEDICINE: LEPROSY

Target audience: age group 15–18. **Subjects:** cross-curricular task within health and care subjects and mother tongue.

Aims: To research an illness from the past – leprosy, its etiology, symptoms, treatment, past and present situation in Norway and in the world.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- analysis, synthesis, cooperation;
- students will learn about leprosy, medication, its past and present.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students work in groups of 3 (with elements of collaborative learning). They are given a picture and a mind map suggestion on A3 sheets. They are supposed to write down what they think about the picture (5-minute conversation about the picture) on the sheets of paper. The groups then receive questions (one after another) from the teacher and may use approx. 5 minutes to find the answers. Students can use different sources of information on the net. They write down on the mind map. Afterwards students will answer the questions loud to the rest of the class. It will be in a form of a quiz.

The teacher is a guide and helps during the previous stages and then summarizes what the students have found out and possibly gives a lecture which complements their findings about the topic. The teacher helps the students learn more about the subject (conversation, suggestion for certain sources etc.) and evaluates the answers given by the students in the quiz.

- The next step is a visit to Leprosy Museum in Bergen and starting a reading project - the book: "Øya" (The Island) by Victoria Hislop.

The last task is aimed at revising what the students have learnt and focusing on the patient and his/her feelings. Norwegian teacher can use the book to carry out a literary analysis as well.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by making a list of questions, showing pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), evaluates the final product – a quiz (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (trip to Leprosy Museum in Bergen and reading project) will take place outside the classroom. Students use their laptops to surf the net to find possible sources of information. Reading project can be partly carried out as a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*

Ongoing evaluation: ongoing feedback and support

Formal final evaluation (quiz): number and quality of correct answers can be evaluated.

Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.

- *Students*

Self-evaluation: what I have learnt, will it have influence on my life, how I worked, what I can do better next time.

- *Teacher and students*

Evaluation of the group work.

Topic: LITERARY GENRE – A POEM OR A SHORT STORY

Target audience: age group 15–18. **Subjects:** mother tongue or a foreign language (for advanced learners).

Aims: to learn about different literary genres in general and about a poem in particular.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- analysis, synthesis, cooperation; knowledge about different literary genres in general and special focus on poetry, and linguistic and literary tools.
- students will also reflect upon the role/presence of poetry in various social contexts and their own attitude to poetry.

The learners work in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using examples from different poems (suggested by the teacher or chosen by the students). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

What will be the teacher's expectations from the students (or what will be the role of the students)?

- Students get a number of texts. They are supposed to read them and find characteristics of a poem and the characteristics of a short story as a literary genre. They can also use some sources of information to help. Later, they create a Venn diagram where they place what is similar and different in a short story and a poem.
- Next part is to make a list of linguistic tools that are often used in poems and explain what can be achieved by using them.

The teacher is a guide and helps during the previous stages and then summarizes what the students have found out and initiates a discussion about it. Making a Venn diagram lets the students organise what they have got to know. It can let them understand similarities and differences between different genres.

- Now students must create a form of presentation (film, cartoon, and lecture) where you can teach you friend about the poem as a genre.
- The last task is to write a poem where the students use some of linguistic and literary tools.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by giving the texts and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (mind maps – Venn diagram), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms. Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making the presentation and writing a poem can be either a school work or homework tasks.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*
Ongoing evaluation: ongoing feedback and support
Formal final evaluation (final task – presentation): information content; quality of the language used (grammar, style, vocabulary scope and its precision);
Poem: quality and quantity of linguistic and literary tools but not a formal evaluation
Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.
- *Students*
Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do it better next time.
- *Teacher and students*
Evaluation of the group work.

Topic: MATHEMATICS AND ECONOMY LITERACY: CREDIT CARDS

Target audience: age group 15–18. **Subjects:** Mathematics with focus on personal economy and usage of credit cards.

Aims: to improve the knowledge about the costs of usage of credit cards; reflect on the risks and benefits connected with the use of credit cards and who really makes profit on them.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- analysis, synthesis, cooperation;
- knowledge about the credit cards, interest rates, annual fees;
- students will learn about the real costs of credit cards for the customers;
- learners will also reflect upon credit cards' influence on their own economic situation.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue. Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students should find facts about credit cards. How do you apply for a credit card? What criteria do the banks have for you to get a credit card? How many credit cards can a person have? What are the advantages and disadvantages of having a credit card? Is it more expensive to "borrow" money on credit cards than to have a bank loan? They make a mind map that one systematizes what one has found and present it to the rest of the class justifying own choices.

The teacher is a guide and help during this stage and then summarizes what the students have found out and initiates a discussion about it and tones it when needed (students may get very agitated by the topic).

- Students work in pairs. They will create a short presentation/lecture: "Imagine that you are going to teach friends about credit card use".
- The last task (learning by teaching) lets the students recapitulate what they have got to know. It will let them understand the benefits and detriments connected with the use of credit cards by an average person.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms; students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a lecture/presentation can be either a school work or a homework task.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*
Ongoing evaluation: ongoing feedback and support.
Formal final evaluation (final task): information content; quality of the language used (grammar, style, vocabulary scope and its precision).
Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.
- *Students*
Self-evaluation: what have I learnt, will it have influence on my life, how did I work, what can I do it better next time.
- *Teacher and students*
Evaluation of the group work.

Topic: MACRONUTRIENTS. PROTEINS

Target audience: age of group: 15–18. **Subjects:** cross-curricular task within health and care subjects and mother tongue or a foreign language for advanced pupils).

Aims: to learn about the macronutrients in general and proteins in particular. The role of proteins for our body, sources of proteins now and in the future.

How will the creative and critical activity develop the students?

Students will develop the following competencies:

- analysis, synthesis, cooperation; knowledge about proteins as one element of macronutrients.
- students will learn about possible sources of proteins. They will also reflect upon its role in nutrition and the wellbeing of our organisms. Students have to think/research how we can provide enough protein depending on our lifestyles and diets.

The learners are working in pairs or as a group during the activity. This allows them to compare answers, brainstorm ideas and clarify problems together using mother tongue or a foreign language (advanced learners). Groups can divide their task in the activity in such a way that every student in the group can work on his/her level and contribute to the final product (sense of achievement).

Students can evaluate the effectiveness of pair/group work during their work and afterwards.

Teacher's expectations (the role of the students)

- Students brainstorm on protein and make a mind map to activate prior knowledge. Then we talk about mind maps together and the teacher has a lecture on protein (can use power point or that one gives notes and students find information themselves. At the end of the theoretical part, students must write a factual text about proteins. They must use these words: 10-20%, animal protein, building cells, vegetable protein, muscles, 9, exercise, good sources, 20, dairy product, amino acids, fish and meat, energy.

The teacher is a guide and helps during the previous stages and then summarizes what the students have found out and initiates a discussion about it and tones it when needed (students may get very agitated by the topic).

- As the last task students will work in groups of max 3. Each group draws a card with a topic:
 - Exercising and protein
 - Protein and environment (meat production)
 - Protein powder
 - Vegetarian/vegan food
- The groups decide what thesis they will make within the topic and work on it. Finally, the group should prepare a lecture to the class on this topic.

The last task allows the students recapitulate what they have got to know. It will let them understand that their own eating habits can have an impact on their health, and diet should depend on their lifestyle. They will also deepen their knowledge in a chosen aspect of the topic.

The role of the teacher in the task and presentation:

The teacher becomes the process facilitator. He/she initiates it by showing the pictures and presenting the task and some detailed/leading questions. His/her task is also to secure that the task's educational content meets the requirements of the national curriculum plan.

Teacher provides the proper pictures, asks leading and stimulating questions (HOTS – higher order thinking task), helps the students during work (ongoing evaluation), suggests visual tools or problem thinking models (for example mind maps), gives/shows guidelines and examples of a possible final product, evaluates the final product (possible formal evaluation), and at the end he/she evaluates and aids the students to evaluate the quality of the cooperation within the groups.

Creation of learning environment. How will the educational environment be achieved?

Learning takes place in a classroom to start but then (research phase) students can decide where they work (classroom, school library or study rooms). Students use their laptops to surf the net to find possible sources of information or they can use library resources. Making a lecture/speech can be either a school work or a homework task.

Mokytojo pareiga užtikrinti, kad užduoties mokomasis turinys atitiktų nacionalinio ugdymo plano reikalavimus.

Assessment (what will be the proof that students and teachers are satisfied with the results?)

Activity evaluation criteria. Learning results (products) assessment criteria.

- *Teacher*
Ongoing evaluation: ongoing feedback and support.
Formal final evaluation (presentation/lecture): information content; quality of the language used (grammar, style, vocabulary scope and its precision); structure of the presentation.
Self-evaluation: how did I introduce the task, was it satisfactory, should I make it in a different way next time, how do I evaluate my help and effectiveness during the work on the task.
- *Students*
Self-evaluation: what I have learnt, will it have influence on my life, how I worked, what I can do it better next time.
- *Teacher and students*
Evaluation of the group work.

Topic: WHAT ROLES DO SOCIAL MEDIA AND TECHNOLOGY PLAY IN OUR LIVES?

Target audience: 16–7 years old age group; Grade 11. **Subjects:** Social studies, Ethics, Psychology, History.

Aims: by the end of this lesson, students will:

- Examine claims of technological addiction.
- Conduct research about technological addiction.
- Reflect on the impact of their own online habits.

Students will develop the following competencies:

After this lesson, students will be able to:

- define "technology addiction";
- explain what causes technology addiction, including specific risk factors;
- describe the signs and physical and behavioral symptoms of technology addiction;
- identify technology addiction in samples;
- discuss the treatment options for technology addiction.

How do creative and / or critical activities educate students?

Conducting research about technological addiction and discussing about it students will expand their own perception about process of addiction and support/help possibilities.

What is the role of the teacher in the task and presentation: in the task of the students?

Thinking questions:

- Are students addicted to their cell phones? If so, is that a problem?
- What are the signs that a person has addiction?
- How does this addiction affect our social life?
- How has technology affected users' concentration and productivity?
- Is a "technology detox" feasible in today's society? Would you be willing to try one?
- How can we find out if Internet addiction is a problem among teens in our school or community?
- What background information do they need? (For example, what is the definition of addiction? Who counts as a "teen"?)
- Who might have answers? (Possible responses include parents, teens, and psychologists specializing in treating addiction, teachers.)
- What do you need to ask each source?
- How and when will you do the asking?
- How will you present your findings?

Creative / Critical Thinking Products / Results

Created and discussed research project on technology addiction.

Video link is provided below to start the discussion:

Filmukas <https://study.com/academy/lesson/what-is-technology-addiction-definition-signs.html>

Watch with pupils and discuss:

Are students addicted to their cell phones? If so, is that a problem?

What are the signs that a person has an addiction?

How does this addiction affect our social life?

How has technology affected users' concentration and productivity?

Is a "technology detox" feasible in today's society? Would you be willing to try one?

Have students download the Moment app, which tracks cell phone usage, and use their phone normally for several days. Are students surprised by the amount of time that they actually spend on their phones? Why? Will this information change their future behavior?

Task. Students will then conduct a research project to investigate whether Internet addiction is real and, if it is real, whether it is an issue in Lithuania.

Ask students:

How can we find out if Internet addiction is a problem among teens in our school or community? Tell students they will tackle this question as a research project.

Divide students into teams of five or six. Have them plan their research. During that process, they should consider:

What background information do they need? (For example, what is the definition of addiction? Who counts as a "teen"?)

Who might have answers? (Possible responses include parents, teens, and psychologists specializing in treating addiction, teachers.)

What do you need to ask each source?

How and when will you do the asking?

How will you present your findings?

Refine the Research Process:

1. Ask the members of each team to present their plan to their classmates, taking comments and questions. The goal is for each team to improve their own research process and the other teams' research processes as well. Eventually they may incorporate each other's findings into their own reports, so everyone has a stake in every team doing well.
2. Depending on the level and experience of the students, this step should also include discussions of:
3. Preserving the privacy of people they survey or interview (including any human subjects research protocols that exist in your school).
4. Obtaining necessary permissions (e.g., if they want to conduct surveys of people at the mall, they need to get permission from mall management).
5. What constitutes scientifically valid sampling (e.g., the difference between random sampling and just talking to their friends).
6. The difference between investigative journalism that gathers information from secondary sources (e.g., psychologists or addiction specialists) and investigation that asks teens directly about their own experiences.
7. What to do if they encounter someone who is "addicted" or struggling with a problem?
8. Set a deadline for students to turn in their research findings, either as written homework assignments or, if time permits, as presentations to the class. Teams may want to cooperate (e.g., everyone using the same survey questions so they can easily combine results at the end). Then let the research begin.

Teacher's expectations (the role of the students)

Actively discuss in the lesson, share their opinion with others, give arguments, look for information and critically evaluate it.

Evaluation (what will be the evidence that pupils and teachers are satisfied with the results?)

Informally – students' engagement in discussion.

Created research projects.

Creating an educational environment

The environment can be traditional and non-traditional, students might need to use computers.

*Authors: Justina Naujokaitienė, Larisa Gražienė
Kaunas Saule Gymnasium*

Topic: MENTAL ILLNESS AND STIGMA

Target audience: 16–17 years old age group, Grade 11. **Subjects:** Psychology, Ethics, Social studies.

Aims: perspectives on abnormal behavior.

Students will develop the following competencies:

- Define psychologically abnormal behavior.
- Describe historical and cross-cultural views of abnormality.
- Describe major models of abnormality.
- Discuss how stigma relates to abnormal behavior.
- Discuss the impact of psychological disorders on the individual, family, and society.

How do creative and / or critical activities educate students?

Making their own public service announcements and discussing about mental illness students will expand their own perception about mental illness.

What is The role of the teacher in the task and presentation: in the task of the students?

Thinking questions:

- How could You describe a psychological disorder, give an example?
- What is normal vs. abnormal? Discuss with arguments.

Scaffold knowledge and build psychology terminology:

- Compare being abnormal to being eccentric.
- Identify and discuss cultural variations in abnormality.
- Discuss the historical use and current legal definition of insanity.
- Tools and methods for creative and critical thinking.

Provide definitions and older explanations for mental illness (historical, medical, and psychological).

Discuss the use of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the recent release of the DSM-5. Identify strengths and weaknesses in using the DSM to diagnose mental illness.

Elaborate on a weakness of the DSM being the use of labels. Understand experimental design of the Rosenhan research.

Critical thinking discussion on stigma.

Creative / Critical Thinking Products / Results

Have students create their own public service announcement. For example, students could create a video or print campaign for their school.

Several video links are provided below to start the discussion on stigma on a page:

<https://bringchange2mind.org/learn/psas/#schizo>

Watch them with pupils and discuss:

- How can public service announcements be an effective use of communication?
- What type of announcement would you like to see next?
- What are the main things in public service announcements?

Task. Create their own public service announcement.

The <https://www.pixton.com/> tool can be used to create the advertisement or to make a short video can be used other programs chosen by the pupils.

Teacher's expectations (the role of the students)

Actively discuss in the lesson, share their opinion with others, and give arguments.

Evaluation (what will be the evidence that pupils and teachers are satisfied with the results?)

Informally – student engagement in discussion.

Created public service announcements.

Creating an educational environment.

How will the educational environment be prepared?

- The environment can be traditional and non-traditional. It all depends on what kind of activity is organized: lesson or extracurricular

*Authors: Justina Naujokaitienė, Larisa Gražienė
Kaunas Saule Gymnasium*

Topic: ABSTRACT STATEMENTS OF LAWS OF THERMODYNAMICS

Target audience: 17–18 years old students. **Subjects:** Physics and IT.

Aims: using the former knowledge of the laws of thermodynamics adapt random statements to specific cases and justify your decision by constructing a Mind map.

Students will develop the following competences:

- the ability to analyze objects, phenomena and processes of thermodynamics,
- systematize information and create a mind map of information for submitting information using the *Mind map* program,
- to critically evaluate and argue,
- the ability to monitor self thinking,
- the ability to reason.

Activities in the lesson

At the beginning of the lesson students get a task:

To revise the concepts of thermodynamics by drawing circuits to determine the relationships based on the aggregated experimental facts (entropy, thermal equilibrium, irreversible processes, energy, heat, work, temperature, etc.).

The goal for the lesson is: using the former knowledge about the laws of thermodynamics, apply these statements to specific cases and justify your decisions.

Short information about thermodynamics is presented to the students. Such as:

British Physicist and writer Charles Percy "C. P." Snow, Baron Snow wrote that thermodynamics is a science about how energy is working in the system (from engine to the Earth nucleus). He presented the laws of thermodynamics in this way:

- *You cannot win.*
- *You cannot avoid loses.*
- *You cannot leave a game.*

Students are given a task:

Working in pairs or individually, using previously arranged argumentative chain of relationships, interpretations of various cases, the reasoning is sought for an explanation of these statements. You should show in the mind map those areas that are responsible for clarifying a particular statement or building new relationships (See annex).

At the end of the lesson, students present their *Mind maps*.

Teacher Expectations

- Students working on their own, analyzing the information they need on the bus to substantiate their statements.
- Pupils work in pairs, discuss their plan of action, explain, analyze, explain what the consequences are, and look for information in the textbook and online.
- Using the questions asked by the teacher, independently asking questions.
- Because the implications of presenting information are diverse structures, modeling mind maps that help information and make decisions are sustainable and discover new, peculiar solutions exceptional thinking.

- Demonstrates understanding of the task, evaluates it from various angles, utilizes targeted and reliable information, and demonstrates relationships between all cases of thermodynamics.
- The following questions and tasks apply to reflection:
 - Questions to refine your mind or guess?
 - Relates your guess to the statements you make?
 - Questions to test the assumption?
 - Questions on Evidence (How can we determine if evidence is related statements)? Can you doubt the given evidence? What are the best examples of these statements? Why do you think this is the right decision?
- Create mind maps. Defend your views by presenting them publicly.

Learning resources: textbook and internet.

Thinking questions:

- What cannot be gained from thermal processes?
- How can we verify that the statement is true or false?
- What questions should we first answer in order to substantiate our claims?
- Why do you think energy losses cannot be avoided?
- Why do we choose the Mind map method to substantiate or refute Ch.P Snow's claims?

Tools and methods for creative and critical thinking:

1. Repeat thermodynamic concepts using the Bag method; this is how we remember knowledge and experiences related to the following concepts: *entropy, thermal equilibrium, irreversible processes, energy, amount of heat, work, temperature, and so on.*
2. Procedure for this method:
 - asking what students know about these concepts or processes;
 - students write down everything they remember in their notebooks;
 - working in a group, discussing and improving their knowledge, finding out where the discrepancies are and why.
 - All groups present facts that are relevant to the statements.
3. The skills of working with the Mind map program are discussed. Expert advice.
4. Working in pairs, drawing a mind map.

Tools

Personal computer or mobile phone with FreeMind App

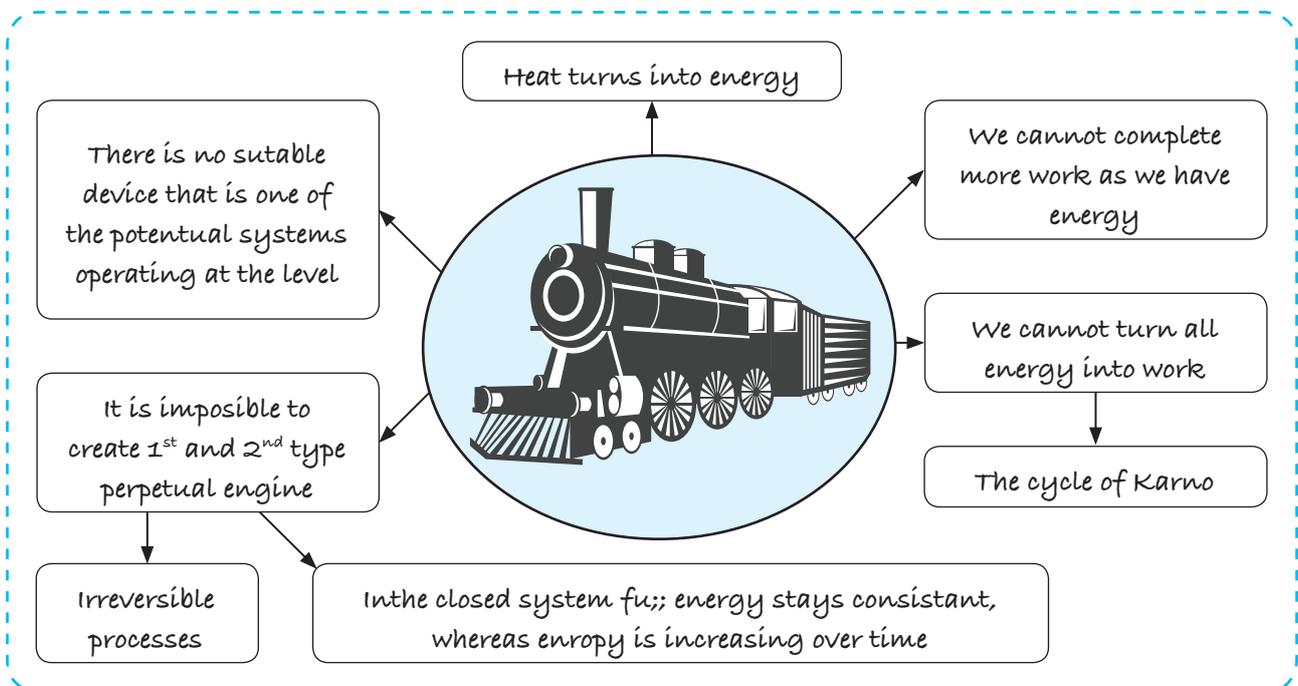
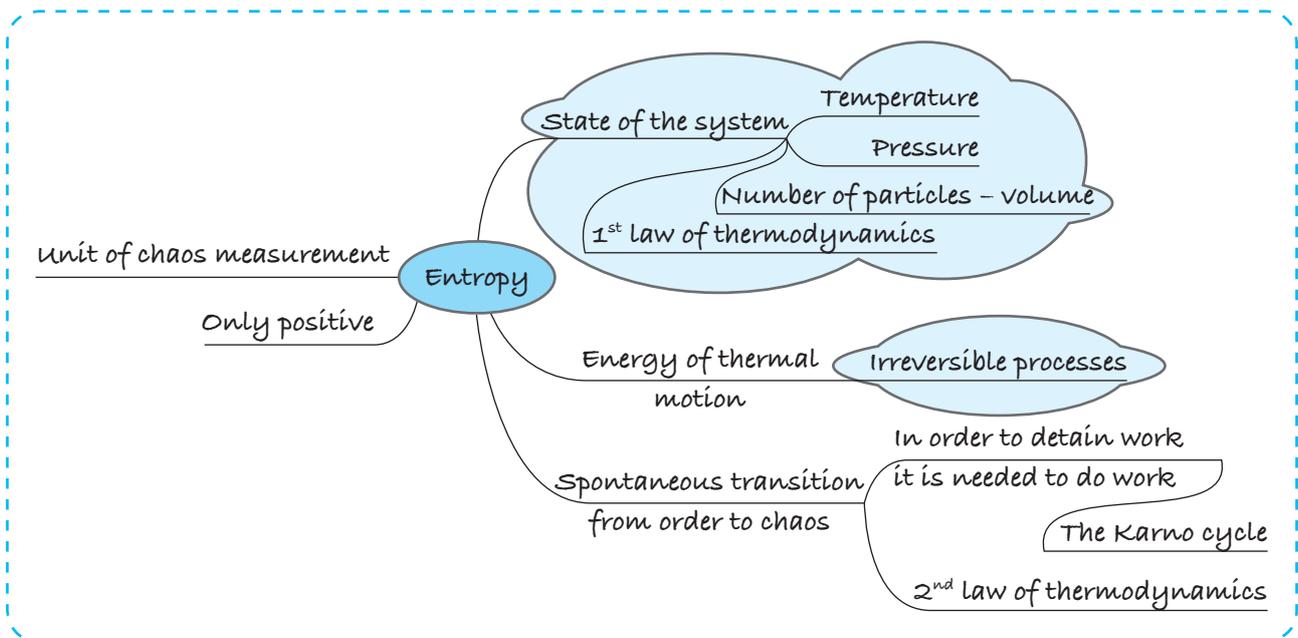
What learners will learn?

Students will develop creative and critical thinking skills by making Mind map, communication and public speaking skills by presenting their mind map.

Products / results of creative and critical thinking.

What will be created?

Thinking map example.



Create a "scaffold":

Phraseology – the Laws of Murphy.

- *Law 1st of Thermodynamics:* When playing with the universe, you cannot win.
- *Law 2nd of Thermodynamics:* When playing with the universe, it is impossible to stay with what you had.
- *Law 3rd of Thermodynamics:* Don't Lose – Don't Play.

Try to explain the following statements in your own words without using a term.

At the beginning, draw in a notebook a logical circuit that connects all the terms you need, as you get closer to the task.

Creation of educational environment

- Traditional environment, physics cabinet or IT cabinet.
- PCs or tablets. They can use Mind map and so on.
- Textbook, notes, Internet. This is a lesson in generalization.

Evaluation. Performance self-assessment criteria. Criteria for assessing learning outcomes (products).

Students' work is observed and conclusions are drawn on how thinking skills are used. Students are asked to tell about how they worked, what the path was, what they thought about their path. Intermediate products, schemes, plans, drafts are analyzed. A tolerant attitude towards the work of other couples (groups) is appreciated. Healthy criticism and comments are supported.

*Authors: Larisa Gražienė, Justina Naujokaitienė
Kaunas Saule Gymnasium*