

Erasmus+ program Cooperation partnerships in school
education “Diversifying the STEM Ecosystem”
No 2024-1-LV01-KA220-SCH-000250755

Interdisciplinary Engineering Programme for Students Aged 12–16 (32 lesson)

2025. – 2030.



Co-funded by the
European Union



Publication was funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the State Education Development Agency (SEDA). Neither the European Union nor SEDA can be held responsible for them.

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1. General Characteristics of the Programme

This programme is designed to develop students' STEAM competences, creativity, and entrepreneurial skills by integrating experiential learning with project-based methods. Its structure follows a gradual learning progression: starting with self-awareness and team building, moving to idea generation and prototype development, and concluding with presenting the created solutions to the wider community.

During the first mobility in Lithuania, students work in STEAM laboratories, explore different technological fields, and create early prototypes of their ideas. This phase helps them understand how engineering and creativity are connected. The following three-month virtual phase allows students to examine real problems within their local communities and design a technological product or service that responds to those challenges. Throughout this period, they strengthen both their technological abilities and their soft skills.

The final mobility in Poland offers an opportunity to present the created products at a public fair, reflect on the overall learning process, and evaluate individual and team development.

A major strength of the programme is its interdisciplinary approach. It integrates engineering, information technology, creativity, social awareness, and gender inclusion. In this way, the programme not only enhances students' competences but also builds their understanding that technology can serve as a tool for positive change in society.

Aim of the Programme - to strengthen STEAM and general competences of students aged 12–16 through project-based and experiential learning activities. The programme combines STEAM education with entrepreneurship and general competences such as creativity, leadership, teamwork, and problem-solving. It also aims to increase students' interest in STEAM fields and encourage higher participation of girls.

Objectives:

1. To identify and analyse problems within the local community that are relevant to students' lives.
2. To design an engineering or technological product or service prototype addressing an identified problem, using problem-based and project-based learning methods.
3. To strengthen students' STEAM, creativity, entrepreneurial, and general competences through practical, collaborative activities.
4. To develop students' intercultural competences through participation in international mobility activities in Lithuania and Poland.

Target group:

- 30 students aged 12–16 from 5 partner countries (6 students per country),
- 15 boys and 15 girls.

Programme duration:

- 3-month learning programme (24 lessons)
- Two mobilities: 1 week in Lithuania and 1 week in Poland (5 days + 5 days)

Implementation Guidelines:

One lesson lasts 45 minutes. It is recommended to organise double lessons (2 × 45 min) to ensure continuity of learning.

The programme is recommended to be delivered by two educators:

- one STEM teacher,
- one career specialist.

1.1. Structure of the Programme

Stage	Format	Location	Duration	Description
Mobility in Lithuania	In-person	Panevėžys Regional STEAM Open Access Centre, Panevėžys, Lithuania	5 days	Student teams participate in entrepreneurship, creativity, and STEAM activities. They carry out experiments in the laboratories of the Panevėžys Regional STEAM Open Access Centre and apply problem-based and project-based learning methods. During this stage, students develop a prototype of a business idea, plan further product development, and prepare for the three-month virtual part of the programme. More information: https://docs.google.com/spreadsheets/d/14Wkt5cUNvYBkPzMmepdP3szSlqcg6g7MQOVrjzkABjI/edit?usp=sharing
Virtual Programme	Online	Students' schools in each partner country +	3 months (24 lessons, including 3 online)	The virtual programme consists of 24 lessons organised into five modules:

		three online mentoring sessions	meetings with mentors)	1. Self-awareness and team dynamics. 2. From problem to idea. 3. Development of the product or service. 4. Visual communication. 5. Reflection and preparation for the International STEM Innovation Fair. During this stage, students analyse real problems in their local communities and design products or services using innovative approaches. They learn the basics of marketing and public presentation, reflect on their progress, and prepare for the final presentation of their ideas at the International STEM Innovation Fair. More information: https://docs.google.com/spreadsheets/d/13H8h-6E0e5tkfyavQmEdJe4UWwQbjgyd16JZqBeq0sk/edit?usp=sharing
Mobility in Poland	In-person	Henryk Brodaty Primary School no. 3 in Złotoryja	5 days	Student teams take part in hands-on STEAM activities, collaborate in groups, exchange experiences, and present their final products at the International STEM Innovation Fair.

1.2. General Description of the Mobility in Lithuania

Days	Main Topic	Activities
Day 1	Introduction and Team Building	Activities include getting to know participants from different countries and engaging in a creative team-building exercise “The LEGO Challenge”, designed to encourage collaboration and creative thinking.

Day 2	From Idea to Product	Students meet with business experts and take part in discussions about identifying user needs, defining target audiences, and understanding product value. They also begin generating their own ideas based on these insights.
Day 3	STEAM Experiences I	Practical activities in chemistry, biology, and physics laboratories, enabling students to explore scientific processes through hands-on experimentation.
Day 4	STEAM Experiences II	Practical sessions in robotics, information technology, and artificial laboratories, focusing on applying technological tools and problem-solving methods.
Day 5	Idea Generation Workshop	Teams summarise the knowledge throughout the week, develop an initial prototype of their idea, and define the problem they want to address, the target audience, and the unique features of their product. The day concludes with reflection activities and preparation for the virtual phase of the programme.

1.3. General Description of the Virtual Programme

Modules	Activity	Number of Lessons	Description
I	Self-Awareness and Team Dynamics	3	Students complete a self-assessment test, analyse their personal strengths and areas for improvement, and identify their role within the team. They learn the principles of effective collaboration, trust-building, and the basics of leadership.
II	From Problem to Idea	3	Students learn the fundamentals of business model development. They identify a problem within their community, analyse the market, define the target group, and conduct a SWOT analysis. Students visit a STEAM or engineering company (preferably one working with similar technologies or products) to learn about real technological practices and use this knowledge to refine their product idea.

III	Development of the product or service	10	Students create a product or service prototype by applying principles of design thinking, engineering, and technological creativity.
IV	Visual Communication	3	Students Students learn the basics of communication: how to formulate a value proposition, create visual communication materials (posters, social media content, video content, Canva designs), and prepare to present their product to an audience.
V	Reflection and Preparation for the International STEM Innovation Fair	5	Students learn public speaking, stage presence, structured communication, and fundamentals of preparing a presentation. They work on the final presentation of their product. This module includes three online mentoring sessions, dedicated to discussing progress, receiving guidance, and preparing for the International STEM Innovation Fair.

2. Mobility in Lithuania

The mobility in Lithuania is the first stage of the international programme, where students meet in person for the first time and begin their independent creative work within international teams. Each team develops its own educational business idea, therefore the mobility provides the essential social, technological, and creative foundation for the individual directions that teams will later follow.

The main purpose of this mobility is to familiarise students with the equipment and technological processes available in the laboratories of the Panevėžys Regional STEAM Centre, which they will later use to develop a prototype or service for their educational business

in their home schools. During the mobility, students strengthen their intercultural collaboration skills and gain introductory knowledge of entrepreneurship. This stage serves as the foundation for all subsequent phases of the programme.

Day 1. Introduction and Team Building

The first day of the mobility marks the beginning of the project and focuses on getting to know the international teams and forming initial team connections. The activity “*STEAM Challenge: a LEGO piece?*” serves as the central theme and methodological framework for the entire day, helping students engage in shared tasks and collaborative problem-solving.

The day begins with introductions and team presentations. The Panevėžys Regional STEAM Open Access Centre presents the aims of the mobility, the weekly schedule, and the overall concept of the programme. This introduction helps students understand how the week’s activities fit into the broader context of the project and what role their team will play within it. After the introductory session, students take part in a variety of team-building activities based on the metaphor of LEGO pieces. The LEGO theme is used as a universal and culturally neutral tool that encourages students—whom may not yet know one another—to work together, develop shared solutions, and experience early success within the context of the first day.

In parallel, students are introduced to the infrastructure of the Panevėžys Regional STEAM Centre. All international teams briefly visit the centre’s laboratories, learn about the types of activities carried out in each space, and become familiar with the equipment they will use in the following days. This introductory tour is not intended to provide detailed technological instruction, but rather to give students a general overview of the possibilities available and the disciplines that may be relevant to their upcoming project work.

At the end of the day, students reflect on their collaboration experiences, share their first impressions of working in an international team, and discuss which aspects of the STEAM Centre laboratories interested them the most.

Day 2. From Idea to Product

The second day of the mobility is dedicated to the fundamentals of entrepreneurship and the logic of problem solving. Working in international teams, students participate in the workshop “*From Idea to Product*”, where they explore methods for identifying real problems, analysing user needs, and understanding how value is created in a product or service.

The workshop equips students with practical tools to begin shaping the direction of their team project. Throughout this process, students discuss relevant community issues, examine them from different cultural perspectives, and evaluate their importance. Based on this analysis, they generate initial idea concepts and consider how technology, scientific principles, and processes observed in the STEAM laboratories could support the development of their solution.

These activities help teams understand what characterises a well-developed business idea and prepare them for the upcoming laboratory sessions, where they will test, adjust, and further develop their concepts.

Day 3. STEAM Experiences I

The third day of the mobility focuses on practical exploration in the physics and chemistry–biology laboratories of the Panevėžys Regional STEAM Open Access Centre. These sessions allow students not only to hear about scientific and technological processes but also to experience them directly through hands-on experimentation. Students have the chance to try laboratory equipment, observe technological procedures, and apply experimentation principles that may later support the development of their educational business ideas.

In the physics laboratory, students work with digital design and 3D modelling tools. For instance, using Tinkercad, they design a simple 3D model and then print it using a 3D printer. This activity helps students understand how engineering design progresses from a digital idea to a physical object. It also allows them to evaluate whether 3D technologies could be relevant to the product or service they plan to develop.

In the chemistry–biology laboratory, students will experiment with creating products from natural ingredients, such as soap, bath bombs, or lip balm. These activities introduce them to the properties of various materials and to processes such as mixing, dissolving, and forming. Through this hands-on experience, students learn how principles of natural sciences can be applied in developing small, real, and user-oriented products.

This day gives students important practical experience that helps them understand which technologies could be used when creating their educational business at school, what processes need to be followed, and what knowledge will be necessary to develop their future idea. The hands-on laboratory work serves as a key element supporting the further development and direction of their project.

Day 4. STEAM Experiences II

The fourth day of the mobility program is dedicated to practical activities in the robotics, IT, and artificial intelligence laboratories of the Panevėžys Regional STEAM Open Access Centre. These sessions focus on the application of digital technologies, programming, and algorithmic thinking, helping students understand how technological solutions can become part of the product or service their team is developing.

In the robotics and IT laboratory, students work with microcomputers and create simple interactive systems. For example, they may program a small “mood booster” — a robot that moves or responds using sensors, LED indicators, or sound signals. Such activities help students understand how basic technical components can be integrated into a function that is useful for the user. At the same time, they develop students’ ability to construct logical sequences of actions and test the performance of their solutions.

In the artificial intelligence laboratory, students are introduced to the basic logic of AI through accessible programming environments such as Scratch. Using this platform, they can create an interactive project—for example, a small algorithm that recognises selected signals (such as colours, sounds, or movements) and changes the course of an animation accordingly. This activity helps students understand how data, rules, and conditions form the basis of algorithms, and how AI principles can be applied even in simple, student-friendly formats.

Throughout the day, students explore digital technologies, programming, and automation principles in practice. This experience provides them with a solid basis for considering whether the product or service they are developing could include interactive, automated, or digital components that may be integrated and further expanded within the school environment. These activities ensure that each team understands both the technological possibilities and limitations of their idea, while also gaining skills that will be essential for prototype development in later stages of the project.

Day 5. Idea Generation Workshop

The fifth day of the mobility program is dedicated to consolidating the experiences gathered throughout the week and helping each international team define the direction of its future educational business project. During this day, students reflect on which technologies or processes explored in the laboratories could realistically be applied in their school environment and potentially become part of their prototype.

Teams analyse the problems they have selected, refine their user groups, and evaluate which technological directions best align with the logic of their idea. Students combine insights from the entrepreneurship workshops with the practical experiences gained in the STEAM laboratories, allowing their idea to evolve from an abstract concept into one grounded in real technological possibilities that they can continue developing once they return to their schools.

At the end of the day, a joint reflection session is held. Its purpose is to help students articulate what they have learned, identify which activities were most helpful in shaping their idea, and consider where they see the greatest potential for their team. This reflection concludes the mobility, giving students confidence and a clear direction for the upcoming three-month programme.

This day serves as a bridge between the mobility experience and the activities that will take place in schools—stages in which students will independently create, test, and improve the educational business idea they have chosen.

3. Virtual Programme (24 lessons)

The three-month virtual programme is a key stage of the project, during which students work purposefully in their teams and continue developing the educational business idea they selected earlier (if the idea was successfully defined during the mobility in Lithuania). The aim of this phase is to provide a structured environment in which students can independently apply the STEAM, entrepreneurship, and teamwork competences gained during the mobility. Step by step, they move from an initial concept toward creating a real, functioning product or service.

3.1. Module I

Lesson 1. My Personality Colours

Topic	My Personality Colours
Duration	45 minutes
Materials	1. Computers, phones, or tablets with internet access. 2. Personality test: www.16personalities.com/free-personality-test 3. Reflection sheet: “<i>My Personality Profile</i>” (Annex 1). 4. Writing materials. 5. Projector or smart board (alternative – a large sheet of paper and markers).
Aim and Objectives	Aim: To help students understand their personality type and identify their strengths and weaknesses in order to gain better self-awareness and prepare for further work in the project. Objectives: 1. To complete a personality test. 2. To identify personal strengths and weaknesses. 3. To define one personal trait that the student aims to improve during the programme.
Outcome	The lesson helps students understand their personality, as well as their thinking and behaviour patterns. Self-awareness is essential for developing personal, social, and learning competences, and for preparing students to work effectively in teams throughout the project.

Activity Procedure	1. Introductory Task (5 minutes) Students individually write down three personal traits in their notebooks that they believe best describe them. From these traits, they select the one they consider most important and write it on a shared sheet of paper or on the smart board. Digital tools such as Mentimeter may also be used. The teacher initiates a short discussion, encouraging students to justify their choices and reflect: “<i>Why did you choose this particular trait?</i>”, “<i>Would others describe you in the same way?</i>” In summarising, the teacher highlights that this activity helps students begin the process of self-exploration, which will be further developed throughout the lesson. 2. Completing the Personality Test (20 minutes) Students independently complete the personality test on the website www.16personalities.com. The teacher explains that the test is based on the personality type theories of C. G. Jung and Myers–Briggs, and that its purpose is not to evaluate or grade students, but to help them understand their thinking, behaviour, and communication patterns. After completing the test, students review their results and note the key insights that emerged during the activity. 3. Completing the reflection sheet “My Personality Profile” (15 minutes) Based on their test results, students complete the reflection sheet (Annex 1), in which they: ● indicate their personality type, ● identify three personal strengths and two areas for improvement, ● describe how these traits appear in their daily behaviour and learning, ● formulate one specific personal development goal for the duration of the programme. The teacher provides guidance and, if needed, helps students interpret unfamiliar terms or concepts. 4. Reflection (5 minutes) At the end of the lesson, students respond—either verbally or in writing—to the question: “<i>What did I learn about myself today, and how might this insight help me during the project?</i>”
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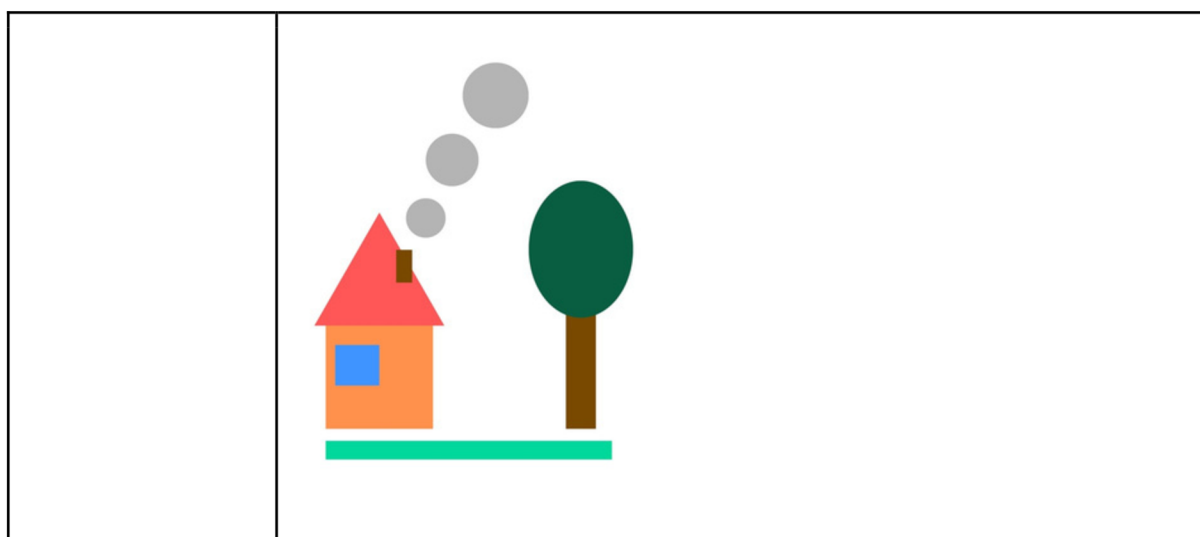
	The teacher summarises the activity by highlighting that self-awareness creates the foundation for personal development, intentional learning, and productive teamwork.
Evaluation and Self-Assessment	Students carry out self-assessment by completing the reflection sheet “ <i>My Personality Profile</i> ” (Annex 1) and comparing their initial descriptions of personal traits with the results of the personality test.
Learning Competences	Cognitive, personal, social, and learning competences are developed.

Lesson 2. Trust and Communication in the Team

Topic	Trust and Communication in the Team
Duration	45 minutes
Materials	Blindfolds, a children's puzzle, sheets of paper, markers, a timer, and stickers.

Aim and Objectives	Aim: To strengthen students' ability to collaborate, communicate clearly, and build trust within their team. Objectives: ● to develop communication skills, ● to foster teamwork skills, ● to reflect on personal and group experience.
Outcome	Students will be able to collaborate effectively, express their ideas clearly, listen to others, and build trust within their team.
Activity Procedure	1. Introductory Activity – Game “Human Knot” (10 minutes) The aim of the game is to work together to untangle a web of interconnected hands without letting go, using teamwork and clear communication. Participants stand in a circle. Each person extends both hands forward and holds hands with two different participants. The key is that everyone in the circle becomes connected, forming a complex “knot.” The group must then try to untangle themselves without releasing their hands. Participants may move around, change positions, and cooperate until the knot is resolved. If there is a larger number of students, it is recommended to divide them into smaller groups of 4–5. Discussion: The teacher asks guiding questions such as: ● “What helped you untangle the knot?” ● “How did the team make decisions?” ● “What challenges did you face?” The teacher explains that during this lesson students will develop trust in one another and strengthen their effective communication skills. 2. “Puzzle” (25 minutes) Activity To strengthen trust among team members and to practise attentive listening and effective communication. Students are divided into pairs. One partner is blindfolded, while the other must give precise verbal instructions on how to assemble the puzzle. The student giving instructions may not touch the puzzle pieces, and the student completing the task may not speak. After completing half of the puzzle, the partners switch roles. If more students are participating, they are divided into groups of four. In this format, two team members give instructions, while the other two—blindfolded—assemble the puzzle.

	Activity discussion: • How did you feel when you had to rely on other team members? • Which role did you prefer—the “listener” or the “leader”? • When did the team start working more effectively, and what contributed to this? 3. Reflection Activity “My Role in the Team” (10 minutes) Each team draws outlines of their hands on an A4 sheet (one outline for each member). In their own handprint, students write one strength they demonstrated during the activity. In another team member’s handprint, they write one positive trait they observed in that person (e.g., patience, clear communication, support). The teacher invites students to share briefly: • “How did I contribute to the team’s success?” • “Which strength did I use today?” • “What would I do differently in the next team activity?” Activity outcome: The activity strengthens group trust and enhances students’ ability to recognise and articulate positive qualities in themselves and others.
Evaluation and Self-Assessment	Students carry out self-evaluation during the reflection activity “My Role in the Team.”
Learning Competences	Social, communication, cognitive, and personal competences — including the ability to work in a group, trust others, communicate clearly, and reflect on collaborative experiences — are developed.
Notes	In the “Puzzle” activity, instead of a traditional puzzle, you may use an image with geometric shapes or other simple drawings, for example: 1. Example 1. (Annex 2)  2. Example 2. (Annex 3)



Lesson 3. Creativity Challenge: Building a Tower

Topic	Creativity Challenge: Building a Tower 45 minutes Each team receives:
Duration	40 spaghetti sticks, scissors, adhesive tape (no
Materials	length limit), 4 marshmallows, and a sheet of paper for creating the tower design. Each participant receives: a “ Blob Tree ” diagram (Annex 4) (may also be displayed collectively on a smart board), pens, and a sheet of paper for notes.
Aim and Objectives	Creativity and the ability to collaborate are among the most important 21st-century skills, essential not only in engineering but across all STEAM fields. In this lesson, students will apply engineering thinking in practice by planning, experimenting, and making decisions while working as a team. Aim: To develop creative and engineering thinking, as well as teamwork and problem-solving skills, by building a stable tower using limited materials. Objectives: • To learn how to plan, coordinate actions, and distribute responsibilities within a group. • To strengthen problem-solving and effective communication skills. • To reflect on the experience and identify both individual and

	group contributions towards achieving a common goal.
Outcome	Students will improve their teamwork skills and strengthen their decision-making, problem-solving, and effective communication abilities. They will also learn to reflect on their experience, recognise their role within the team, and evaluate their contribution.
Activity Procedure	1. Tower-Building Activity (35 minutes) Building a tower is a classic task for developing engineering thinking and creativity. The most stable towers typically include: • a supportive base that ensures strong the use of triangular shapes, which are more stable than square or linear structures, • a low centre of gravity, which increases overall stability. The teacher may briefly explain these principles before the activity and show an example such as the Eiffel Tower. Activity aim: To build the tallest possible free-standing tower using a limited set of materials, applying creative and engineering solutions while planning and organising the work as a team. Rules: • Total time for the task: 30 minutes (5 minutes for planning, 20 minutes for construction, 5 minutes for presenting results). • The goal is to build the tallest tower with a marshmallow placed on the top • The tower must stand independently, without being supported by hands or objects. • The structure must stand on a stable surface — a table or the floor. Procedure: 1. Planning (5 minutes): Before construction, the team spends time discussing and finalising the design idea. They sketch the tower prototype on a sheet of paper. 2. Construction (20 minutes): Teams build the tower according to their plan, adjusting the structure if needed, experimenting, and collaboratively solving

	any problems that arise. 3. Presentations: The height of each tower is measured, results are discussed, and the winning team is announced. Evaluation Criteria: 1. Height of the tower (in centimetres) 2. Stability of the structure (must stand unsupported for at least 20 seconds after time ends). 3. Creativity and use of engineering principles. 3. Effectiveness of teamwork (collaboration, planning, engagement). 2. Reflection: “Blob Tree” Method (10 minutes) Aim: To help students evaluate their emotional and teamwork experience using a visual reflection method. Students are shown the <i>“Blob Tree”</i> (Annex 4) illustration — a tree with characters placed in various positions, each expressing different emotional states, ranging from active to passive, from leadership to disengagement. Each student selects the character that best represents how they felt during the activity while working in their team and colours it. A short discussion follows (for students who wish to share), focusing on why they chose a particular character. The <i>“Blob Tree”</i> (Annex 4) can also be projected on a smart board. In this case, each student marks their chosen character by writing the first letter of their name next to it.
Evaluation and Self-Assessment	Students carry out self-evaluation using the “Blob Tree” method.
Learning Competences	Creativity, social, cognitive, and learning competences — including the ability to create, experiment, plan actions, solve problems, and reflect on one’s contribution to team work — are strengthened.
Notes	If more students are participating, divide the class into teams of 4–5 members. The teacher may demonstrate examples or show images of well-known towers to discuss their structural principles. After the activity, it is important to allocate time for reflection so that

	students can consider which decisions contributed to success and how creativity emerged within the team.
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3.2. Module II

Lesson 1. Everything Starts with an Idea

Topic	Everything Starts with an Idea
Duration	45 minutes
Materials	A4 sheets of paper (for idea generation and creating user profiles), the worksheet <i>"Idea Workshop"</i> (Annex 6), pens, pencils, markers, and tools for displaying the problem-and-needs illustration (a projector or a printed poster). Optional: old magazines, newspapers, glue — for creating cut-out elements for the user profile.
Aim and Objectives	Aim: To help students learn how to identify a problem or need, generate ideas, and refine a business concept focused on an engineering-based solution. Objectives: 1. To recognise a problem in their daily life, school, or the wider world. 2. To generate several possible ideas for solving this problem. 3. To refine one main idea that will become the basis of their educational business project. 4. To identify the user whose needs the business idea will address.
Outcomes	During the lesson, students will: ● identify a clearly defined core problem they want to address, ● create a User Profile (including a drawing and description) focused on the user's needs, ● generate a feasible business idea with potential for an engineering-based solution.
Activity Procedures	Developing a business plan begins with an idea — a clearly formulated understanding of which problem or need can be addressed by creating a new product or service. During the lesson, the following stages of business idea generation are

	explored: 1. Identifying the problem. 2. Generating ideas. 3. Selecting the solution. 1. Identifying the Problem (15 minutes) The first step is to recognise an unmet need, a problem that requires a solution, or an opportunity for innovation. The teacher presents the “<i>Problem and Need Identification</i>” illustration Annex 6 Students individually identify 2–3 problems they notice in their daily life, community, or the world, and write them in the worksheet “Idea Workshop” (Annex 6) — Task 1. Then, using the “<i>Problem and Need Identification</i>” illustration (Annex 5), each student selects two problems they consider the most relevant or urgent — Task 2. It is important that students already begin to think about problems that could potentially be addressed through an engineering-based solution. Students share the two selected problems with their group members. Through discussion, the group identifies one problem they consider the most important and relevant. This problem is recorded in the “Idea Workshop” (Annex 6) worksheet — Task 3. 1. Understand the User (15 minutes) A business idea must address a real and relevant problem — the students have already identified this, so now it is time to explore who is most affected by that problem. On the left side of an A4 sheet, the student group draws a “User Profile Character” (Annex 7) who experiences this problem. The drawing can be realistic, cartoon-like, or any other style — creativity is encouraged. On the right side of the sheet, students write a description of the character: ● WHO IS HE/SHE? ○ Name ○ Age ○ Where they live ○ What they do ○ What are their hobbies? What do they like to do? ● WHAT DOES HE/SHE THINK AND FEEL?
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	during the lesson by showing hand symbols: ● I understand which problem I want to solve. ● I know who (which type of user) is affected by this problem. ● Our team collaborated and listened to one another. ● We developed an interesting idea that could work in real life. ● I enjoyed creating, drawing, and thinking during the activity.
Learning Competences	During the lesson, students strengthen their creativity and problem-solving competences by exploring engineering-based solutions to real-life problems. By creating a User Profile, they develop empathy and the ability to understand the needs of others. Working in teams further enhances their collaboration and communication skills.
Notes	The activity “Understand the User” can also be carried out using different materials — for example, by using old newspapers or magazines to create a customer profile from cut-outs. It is recommended to attach items or images that relate to the customer, their interests, and their needs.

Lesson 2. Business Plan Development

Topic	Business Plan Development 45 minutes The visual “ <i>Team Roles</i> ”
Duration	(Annex 9), an A4 or larger sheet of paper, and
Materials	several small objects for the introductory activity (e.g., a USB flash drive, a flashlight, a paperclip). For the other parts of the lesson, students will need writing materials or computers/tablets with Paint 3D, Canva, or other digital creation tools.
Aim and Objectives	Aim: To structure the team’s engineering-based business idea and develop a clear educational business plan. Objectives: ● To become familiar with the main components of a business plan and understand how they are interconnected. ● To justify the relevance and value of the idea within the context of the identified problem. ● To define team members’ roles and responsibilities based on the provided role schema. ● To prepare an educational business plan.

Outcome	By the end of the lesson, each team will have prepared a clear and structured educational business plan that concisely outlines the problem, the user, the idea–solution, the uniqueness of the idea, its value, and the responsibilities of the team members.
Activity Procedure	A business plan helps students organise their idea clearly — from the identified problem to the possible solution and its benefits. It allows them to understand for whom the product or service is being created, why it is valuable, and how the team will work together to achieve results. While preparing the business plan, students learn to plan, share tasks, and collaborate effectively in a group. This document becomes a solid foundation for further work and helps students see the entire project as a clear and coherent process. 1. Introductory Activity (5 minutes) To strengthen student motivation and introduce the topic of the lesson, the class begins with the activity “What is this object?” The aim of the activity is to show that every object has its own problem, solution, and user. The teacher shows one or several items—for example, a USB drive, a flashlight, a paperclip, a water bottle, or other familiar objects—and asks students: ● Who is this object for? ● What problem does it solve? ● How does it work? ● Who uses it? In summarising, the teacher explains that every object was created because someone needed a solution to a specific problem. The same applies to the business ideas the students are developing. In this lesson, they will structure their idea and prepare the foundation of a clear and coherent business plan. 2. Selecting Team Roles (10 minutes) The teacher presents the visual “<i>Team Roles</i>”, either by displaying it on the screen or by distributing printed copies. Together with the students, the teacher discusses the main roles needed for developing a business idea: team leader, project coordinator, marketing and communications specialist, finance specialist, and engineer–technician. Students are also encouraged to consider whether additional roles might be relevant for their specific project. The team reviews the role descriptions and the guiding questions, which help them assess each member’s strengths and identify the most suitable function in the project.

	Students are invited to revisit Module I, Lesson 1, where they explored their personality type, strengths, and areas for growth. These insights can guide them in selecting the role that best matches their personal qualities, working style, and interests. After a brief discussion, students assign roles in a way that best aligns with each member's abilities, preferences, and personality profile. 3. Developing the Business Plan (25 minutes) In this activity, students create a one-page business plan, systematically describing or visually presenting the key elements of their engineering-based solution. The plan may be created on an A4 or larger sheet of paper, or using digital tools such as <i>Paint 3D</i>, <i>Canva</i>, or <i>Google Drawings</i>. Students are encouraged to refer to the visual in Annex 10 while completing the task. 1. Problem In this section, students provide a concise description of the problem, based on the results of the previous lesson. The description should focus on the core difficulty and its underlying cause. It is recommended to express the problem in 1–2 sentences or to visualise it using a symbol or a simple metaphorical illustration. 2. Idea – Solution Here, students briefly present their engineering idea — the object, device, mechanism, or system they propose. The emphasis should be on how the solution works and in what way it addresses the problem. 3. Uniqueness This section helps students evaluate how innovative, distinctive, and valuable their proposed solution is. Students describe how their idea stands out compared to existing alternatives. The uniqueness may relate to improved efficiency, greater convenience, sustainability aspects, simpler construction, or technological originality. It is recommended that students identify 2–3 key features that make their idea unique, presenting them as keywords, short statements, or simple visual elements. 4. User Defining the user in the business plan helps ensure that the proposed solution is aligned with real needs and reflects a relevant human or group experience.
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	Students are encouraged to use the User Profile created in the previous lesson (Module II, Lesson 1). 5. Value The value section helps students evaluate the positive impact their solution has on the user and the environment, and understand why it is meaningful and necessary. Students identify the main reasons why their product or service is valuable. This may include convenience, safety, time or energy savings, sustainability, improved daily experience, or other important user benefits. It is recommended to select 2–4 key benefits and present them in a short and clear form. 6. Team This section helps students understand why their solution matters and how it will improve the user’s life. Students list all team members and clearly indicate their roles: team leader, project coordinator, engineer–technician, finance specialist, and marketing and communications specialist. It should be clear who is responsible for what during the implementation of the project. This information may be presented in a simple diagram or another visual format. Students are encouraged to refer to Annex 9. 4. Reflection (5 minutes) The team agrees on two statements: one thing that went particularly well in the team today, and one thing that should be improved next time. The team briefly explains their choices. This reflection helps students evaluate their teamwork and identify what would be valuable to strengthen in future activities.
Evaluation and Self-Assessment	Formative assessment is applied during the lesson: the teacher observes students’ collaboration and provides feedback. At the end of the lesson, each team conducts a brief self-evaluation by identifying one successful aspect of their work and one area they would like to improve. During this activity, students strengthen their collaboration and
Learning Competences	communication skills, learn to evaluate their own strengths, and gain a better understanding of the roles of other team members.
Notes	Students may also choose additional team roles, depending on their interests and strengths. It is recommended to draw on the insights gained

	during the first module's lessons about each participant's personal characteristics and teamwork abilities.
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Lesson 3. Business Plan Development: Finance

Topic	Business Plan Development: Finance 45 minutes Computer, worksheet
Duration	"Financial Analysis of the Business Idea" (Annex 11)
Materials	Aim: _____
Aim and Objectives	To introduce students to the principles of financial planning in business and to help them create a clear financial plan for their educational business based on an engineering idea. Objectives: 1. To calculate the costs of creating the product, including its production expenses, cost price, and additional expenditures 2. To determine the product price and plan potential revenue 3. To calculate profit and understand its importance for business sustainability. 4. To apply financial planning in practice by completing tasks based on an example project.
Outcome	By the end of the lesson, student teams will have prepared a clear and structured financial plan that outlines costs, additional expenses, total expenses, unit cost, price, revenue, and profit. Students will understand the key financial concepts and will be able to apply them in developing their engineering-based product or service.
Activity Procedure	In this lesson, students will be introduced to the financial side of a business and will learn how to create a basic financial plan for their product or service. It is recommended to complete this task in an IT classroom using the worksheet "Financial Analysis of the Business Idea" (Annex 11). 1. Example Business Plan (10 minutes) The teacher introduces an example business project — the production of calming candles made with dried Lithuanian herbs (Annex 12). Students briefly discuss the project's problem, idea-solution, product, user, and uniqueness. This example will be used throughout the lesson when analysing the components of a financial plan.

2. Developing the Financial Plan (30 minutes)

Costs (or production costs)

Costs (or production costs) refer to all materials and resources directly used in creating a product or service. In economics, these are known as direct production costs.

They form the basis of the cost price and show how much it costs to produce a certain quantity of items.

What do students need to do?

- Create a list of all required materials and resources.
- Find real prices for these items online.
- Calculate the total costs.

Example of calculating costs using the candle project:

Let's say the team is producing 10 calming candles.

To make one candle, they need 200 g of soy wax.

Raw Material*	Quantity	Unit price, Eur	Total, Eur
Soy wax	2 kg 10	10 0,20 1 3 5	20 2 10 3
Candle wicks	pcs. 10		5
Glass jars	pcs. 1		
Dried herbs	pack 1		
Fragrance oil	bottle		

Total costs:

$$20+2+10+3+5=30 \text{ Eur}$$

***Raw material** – the primary material from which the product is made.

Raw materials form the basis of production because the final product cannot be created without them.

In business and economics, raw materials are classified as direct production costs, as their quantity and price directly depend on the amount of goods being produced.

A raw material is a substance that has not yet been processed, but is prepared to become part of the final product.

Annex 11, Task 1

Additional expenses

Additional expenses are costs that are not directly tied to the production process but are necessary for ensuring that the product reaches the consumer. In economic literature, these are often referred to as indirect costs. They typically include expenses related to packaging, marketing, transportation, and other supporting activities.

Examples of additional expenses include:

- Packaging – paper bags, labels, string.
- Advertising – flyers, posters.
- Transportation – travel to a fair or event.
-

Example of calculating additional expenses using the candle project:

Let's assume the team is producing 10 calming candles.

Type of expense	Quantity	Unit price, Eur	Total, Eur
Packaging (bags)	10	0,2	2
Advertising (poster)	1	3	3
Flyers	30	0,1	3

Total additional expenses: $2+3+3=8$ Eur

It is important for students to understand that a product's cost is not limited to raw materials—additional expenses also influence its final price and profitability.

In a real business, these expenses would also include wages for employees; however, in a student-run educational project, it is assumed that students work on a voluntary basis, so labor costs are not included.

Annex 11, Task 2

Total expenses

This value shows how much the whole project actually costs before the product is sold.

They include:

- Costs (or production costs (materials and supplies))
- Additional expenses (packaging, advertising, transport)

Total expenses = all costs combined.

Example of calculating total expenses using the candle project:

Total expenses: 30Eur+8 Eur = 38 Eur

Annex 11, Task 3

Unit cost

Unit cost is the amount a business must spend to produce one unit of a product. It is calculated by dividing the total production expenses by the number of items made. The cost price is a key element of pricing because it shows the minimum amount for which the product can be sold without causing a loss.

Unit cost = total expenses ÷ number of units produced

Example of calculating the unit cost using candles: *Unit cost = 38 ÷ 10 = 3,80 Eur per candle* **Annex 11, Task 4**

Price

The price is the amount a customer pays for a product. It must be set high enough to cover all production costs and additional expenses, while also allowing the business to earn a profit. In practical business settings, this is achieved by adding a markup to the unit cost. The markup is the extra percentage added on top of the cost price to ensure the product generates income. For this student project, it is recommended to apply a 30–50% markup.

Example of calculating the price using candles:

Unit

cost: 3,80 Eur

Markup (50 %): 1,90 Eur

Price = 3,80 Eur + 1,90 Eur = 5,70 Eur

Annex 11, Task 5

Revenue

Revenue refers to all the money earned from selling a product. In economics, revenue is defined as the total inflow of money generated from selling goods or services over a specific period.

Calculating revenue helps students understand whether their chosen price and projected sales volume can lead to a successful business outcome.

Revenue = Price $\times$ Quantity sold

Example of calculating revenue using candles:

Assuming the team plans to sell 20 candles in one month: Unit price: 5,70 Eur Monthly sales volume: 20 candles Projected monthly revenue = $5,70 \times 20 = 114$ Eur

Annex 11, Task 6

Profit

Profit is the amount by which revenue exceeds total expenses. It is a key financial indicator that shows whether a project is successful and financially sustainable.

Profit = revenue – total expenses

Expenses include both production costs and additional expenses.

Example of calculating profit using candles:

Suppose the team plans to sell 20 candles in one month.

Revenue: 114 Eur

Total expenses: 38 Eur

Profit = $114 \text{ €} - 38 \text{ €} = 76 \text{ Eur}$

Annex 11, Task 7

Loss

A loss occurs when a business's expenses are higher than its revenue — in other words, when the project spends more money than it earns.

Loss = expenses – revenue (when the result is a positive number, meaning expenses > revenue)

Example of calculating loss using candles:

If a team spends 50 Eur but earns only 30 Eur:

Loss = $50 - 30 = 20 \text{ Eur}$

	Understanding loss helps students see that not every project becomes profitable immediately and encourages them to think about how to reduce costs or increase revenue. 3. Three-Step Reflection (5 minutes) Each team member reflects on the group's work during the lesson by answering three questions: 1. One thing we did well today. 2. One thing we will improve next time. 3. One thing we learned today.
Evaluation and Self-Assessment	Three-Step Reflection
Learning Competences	Students develop their financial literacy skills throughout the lesson.
Notes	It is recommended to conduct this lesson in a computer lab.

3.3. Module III

In the third module of the programme, students move from generating an idea to turning it into a tangible solution by developing their product or service. The aim of this stage is to create conditions for students to apply their creative, engineering, and technological skills in practice while gradually shaping their project concept.

Throughout the module, teachers act as mentors: they do not direct every step, but guide the teams forward by asking relevant questions, helping them address challenges, and supporting their independence in the design and development process.

The module is grounded in project-based learning principles: students make decisions independently, experiment, test their ideas, adjust their designs, and learn directly from the results of their actions. This approach strengthens their sense of responsibility, deepens their understanding of the design and engineering process, and develops their ability to collaborate and justify their choices.

Each lesson corresponds to a key phase in the product development cycle — from refining the initial concept to creating a final, functional solution.

The lesson structure in this module is intended as a guideline. The teacher–mentor may freely adjust the duration and depth of each stage, depending on the complexity of the project, the technologies being used, students’ prior knowledge, and the working pace of the group. Some teams may need more time for sketching or testing, while others may require additional support when selecting materials, refining constructions, or producing the final version of their product.

By the end of the module, students have a complete solution: this may be a functional prototype or a fully assembled product ready for presentation. They are also able to clearly explain the reasoning behind their design, technological, and structural decisions, demonstrating an understanding of how their solution was developed.

This prepares them for the next stage — visual communication of their product or service in Module IV, followed by presenting their work at the International STEM Innovation Fair.

Lesson 1	Refining the Product Idea: Design and Core Functions
In this stage, students move from an abstract idea to a clearer vision of their product. They discuss how the product should look, what functions it should perform, and which core user problems it is intended to solve. Students define key criteria such as size, shape, materials, and colours. This is the first step in understanding the direction in which their project will be developed.	
Lesson 2	Planning the Structure

Students begin to consider how their product will be constructed from a technical standpoint. They create initial diagrams, simple drawings, or basic functional models. During this stage, they learn to understand structural logic: how different elements connect, what determines durability, and which materials are suitable for specific functions. This work lays the foundation for the prototyping phase.

Lesson 3	Creating Low-Fidelity Prototypes
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Students create their first prototypes using simple materials such as cardboard, paper, tape, modelling clay, or basic digital mock-ups. These early prototypes do not need to be precise or fully functional. Their purpose is to test whether the idea works in principle and whether the product could realistically be used in everyday conditions. This stage focuses on experimentation, quick testing, and learning through making.

Lesson 4	Prototype Testing and Gathering User Insights
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This stage focuses on understanding how the target audience perceives and uses the prototype. Students invite classmates, family members, or peers to test the model and observe which parts function well and which areas require improvement. The feedback they collect helps them identify what feels intuitive for the user, what causes confusion, and which elements should be refined.

Lesson 5	Refining the Prototype Based on Feedback
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Based on the testing results, students revise and improve their prototype. This may include adjusting functions, refining dimensions, strengthening structural connections, selecting more suitable materials, or enhancing the visual appearance. The emphasis is on understanding that design is an iterative process: students learn that a strong product emerges through several rounds of refinement and continuous improvement.

Lesson 6	Selecting the Most Suitable Technologies and Materials
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In this stage, students decide which technologies and materials are most appropriate for developing their final product. Some teams may choose 3D printing, while others may work with wood, textiles, electronic components, or biological–chemical mixtures. Students evaluate factors such as cost, sustainability, safety, durability, and expected lifespan. This step prepares them for developing a more advanced and realistic production plan.

Lesson 7	Creating a High-Fidelity Prototype
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At this stage, students develop the final, functional version of their prototype. They work with real materials and appropriate technologies, which makes it essential to follow safety requirements and carry out each production step accurately. This high-fidelity prototype should represent the planned product or service as realistically as possible, reflecting its intended features, functionality, and overall quality.

Lesson 8	Final Prototype Testing and Quality Evaluation
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Students test their completed prototype in conditions that closely resemble real use. They assess its functionality, stability, ease of use, and how effectively it addresses the initial problem. At this stage, the team discusses whether the product meets user needs, whether minor adjustments are still required, and whether the prototype is ready to be presented as a final version.

Lesson 9

Documenting the Product Development Process

Students compile their entire development journey into clear and structured documentation. This includes sketches, photos of prototypes, lists of materials, testing results, records of modifications, and explanations of why certain design or technical decisions were made. Such documentation is essential for the next stages of the project — especially when the team prepares to present their product in Module IV and at the International STEM Innovation Fair.

Lesson 10

Final Reflection and Preparation for the Visual Communication Module

In the final stage, students reflect on their entire development process: what went well, which challenges they encountered, and how their idea evolved from the first sketches to the finished product/service. This reflection helps them better understand team dynamics, recognise their creative progress, and prepare for the next phase — visual communication of their product in Module IV.

These module components are intended as general guidelines. The teacher may freely adjust, extend, or shorten specific stages depending on the complexity of students' projects, the technological requirements, and each team's level of preparedness.

3.4. Module IV

Lesson 1. Visual Identity of the Student Business: Logo Design in Canva

Topic	Visual Identity of the Student Business: Logo Design in Canva
Duration	45 minutes
Materials	1. Computers or tablets with internet access for each student. 2. Access to Canva (free or educational version). 3. Projector or interactive whiteboard for demonstrating instructional materials. 4. Worksheet: <i>“Learning Business Logo”</i>. 5. Resource: Colour Meanings https://www.canva.com/colors/color-meanings/ 6. Illustration: “Colour Meanings” (Annex 13). 7. Illustration: “Meanings of Shapes and Symbols” (Annex 14). 8. Writing materials and A4 paper.
Aim and Objectives	Aim: To help students create a logo for their learning business and understand how colours and symbols communicate meaning. Objectives: 1. To explain what a logo is and why it is important. 2. To explore the meanings of colours and symbols and link them to the business idea and target audience. 3. To design at least two logo versions using Canva. 4. To reflect on how visual identity helps people recognise a product and understand its value.
Outcome	By the end of the lesson, the student team will have defined a clear logo idea with a main message, selected colours, and symbols, created at least two digital logo versions in Canva, and will be able to explain their choices by linking the visual elements to the identified problem and the target audience.
Theoretical Background	Visual Identity refers to the set of visual elements that represent and distinguish a company, brand, product, or organisation. It includes components such as the logo, colour palette, typography, graphic elements, and overall design style. Visual identity communicates a company’s values, personality, and message, helping to create recognition, consistency, and trust among audiences across different platforms and materials. Logo

	A logo is a graphic element that represents the identity of a company, product, or service. It may consist of a single letter, a word, a symbol, or a combination of these elements, and it helps create recognition and distinguish one brand from another. Logos serve multiple functions, including reflecting a company's values and culture, as well as communicating the brand's key characteristics and advantages. The Logo and Its Value for Business A logo is often the first point of contact between a company and its audience. When designed effectively, a logo can strengthen customer trust, support brand recognition, and increase overall brand value. 1. Recognition and Memorability One of the main advantages of a logo is brand recognition. People tend to remember visual information more easily than text. This means that a clear, distinctive logo helps potential customers quickly identify a product or service among competitors. 2. Professional Image A well-designed logo enhances a company's professional image. In contrast, a poorly designed or inconsistent logo may create doubts about the company's reliability, competence, or quality. 3. A Tool for Communication A logo can act as a visual bridge between a company and its customers. Through design elements such as colour, symbols, or shapes, a company can communicate its values, mission, or vision without using words. For example, environmentally focused businesses may use green colours or nature-related symbols in their logos. How to Create a Good Logo A good logo is more than just an attractive design. It should be effective, recognisable, and reflect the character of the company. Below are several key criteria that a strong logo should meet: 1. Simplicity Simple logos are easy to recognise, remember, and remain effective over time. For example, the Apple or Nike logos are minimalistic yet highly impactful.
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	2. Memorability A logo should be designed so that people can easily remember it after seeing it for the first time. 3. Timelessness A good logo should stay relevant over a long period of time. Following short-term trends is not recommended, as trends change quickly. 4. Relevance A logo should reflect the essence, values, and culture of the company. For example, a children's toy company's logo should appear fun and playful, while a legal consultancy's logo should communicate seriousness and authority. 5. Distinctiveness Given the large number of logos in the market, it is important that a logo stands out and is not easily confused with those of other companies.
Activity Procedure identity and engage	During this lesson, students are introduced to the concept of visual identity and engage in the practical creation of a logo for their learning business. 1. Introductory Activity: What Is a Logo? (5 minutes) The teacher briefly explains that a logo is a visual identifier (a word, a symbol, or a combination of both) used to represent and distinguish an organisation or a product. The teacher then presents 3–5 examples of well-known logos (<i>e.g. The Coca-Cola Company, Apple Inc., Google LLC, Barbie, Chanel S.A.</i>) and discusses them with the students by asking: 1. Do you recognise the logo? 2. What do the colours, shapes, and symbols communicate to you? What emotions do they evoke? What do you think the logo represents?  1. The Coca-Cola Company

What it is: A global beverage company best known for its soft drinks, especially „Coca-Cola“. **What the logo represents:** The flowing script logo conveys tradition, familiarity, and timelessness. The red colour symbolises energy, joy, and strong emotional connection with consumers.



2. Apple Inc.

What it is: A global technology company that designs consumer electronics, software, and digital services.

What the logo represents: The bitten apple symbolises knowledge, creativity, and innovation. Its simplicity reflects the brand's focus on clean design and user-friendly technology.



3. Google LLC

What it is: A multinational technology company specialising in internet products and services, including search engines, software, and computing.

What the logo represents: The colourful letters express accessibility, creativity, and diversity. The playful design reflects innovation and an open, friendly approach to technology.



4. Barbie (by Mattel, Inc.)

What it is: A globally recognised fashion doll brand produced by Mattel, aimed primarily at children and young audiences.

What the logo represents: The pink colour and handwritten-style lettering symbolise imagination, playfulness, and self-expression, reflecting creativity and aspiration.



5. Chanel S.A.

What it is: A luxury fashion house specialising in high-end clothing, accessories, perfumes, and

What the logo represents: The interlocking double “C” stands for the founder, **Coco Chanel**, and represents elegance, exclusivity, and timeless luxury.

2. Meanings of Colours and Symbols (10 minutes)

Colours play an important role in shaping visual identity and influencing how a brand or business is perceived. They affect emotions, associations, and first impressions, and different colours communicate different values. For example, blue is often associated with trust and reliability, green with nature and sustainability, red with energy and attention, while black suggests elegance and professionalism. By selecting colours that align with their values and key message, a brand can communicate its identity even before any text is read.

The teacher presents the illustration “*Colour Meanings*” (Annex 13) and explains the general principles of colour use:

- warm colours (red, orange, yellow) – energy, activity, attention;
- cool colours (blue, green) – calmness, reliability, nature, technological precision;
- neutral colours (black, white, grey) – clarity, contrast, professionalism.

The teacher then explains that, similar to colours, symbols and shapes also carry meaning. Students are introduced to the illustration “*Meanings of Shapes and Symbols*” (Annex 14), highlighting how shapes and symbols contribute to visual communication and brand recognition.

Students then work in teams and complete Tasks 1–4 in the worksheet

“*Learning Business Logo*” (Annex 15):

1. Write 3 words that best describe their learning business.
2. Identify 2-3 values associated with their product or service (e.g. sustainability, convenience, innovation).
3. Select 2-3 colours that best represent their idea and justify their choices.
4. Choose 1-2 symbols that best fit their concept and explain their relevance.

While completing these tasks, students are encouraged to use the illustration “*Meanings of Shapes and Symbols*” (Annex 14) and the Canva resource on colour meanings:

<https://www.canva.com/colors/color-meanings/>.

3. Logo Concept Sketching (10 minutes)

At this stage, the team translates its conceptual ideas into an initial visual form. Each team member produces one preliminary logo sketch on an A4 sheet. Artistic accuracy is not required; the primary focus is on clearly representing the concept.

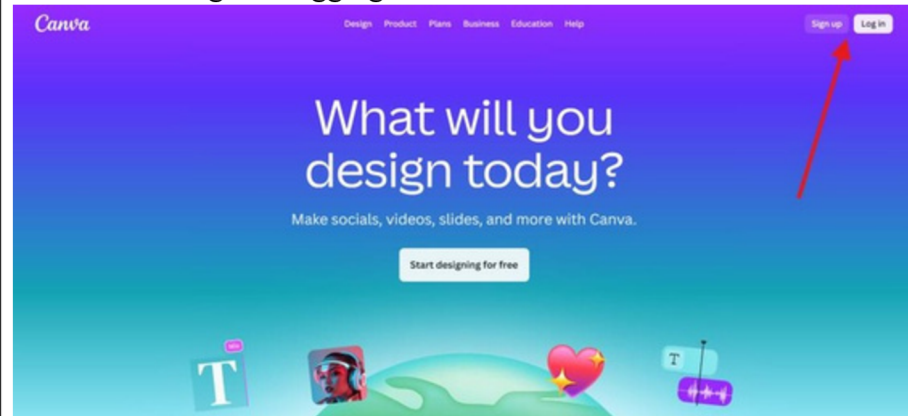
After approximately five minutes, team members present their sketches to the group and collectively select one or two concepts for further development in the Canva environment.

4. Digital Logo Design in Canva (15 minutes)

Using a projector, the teacher provides a structured, demonstration of the Canva platform, beginning with:

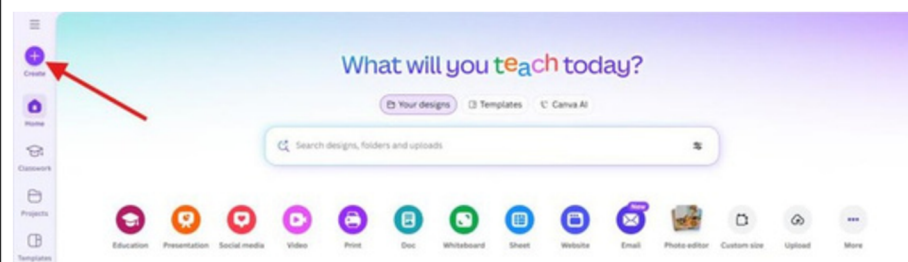
step-by-step

1. Accessing and logging in to Canva.

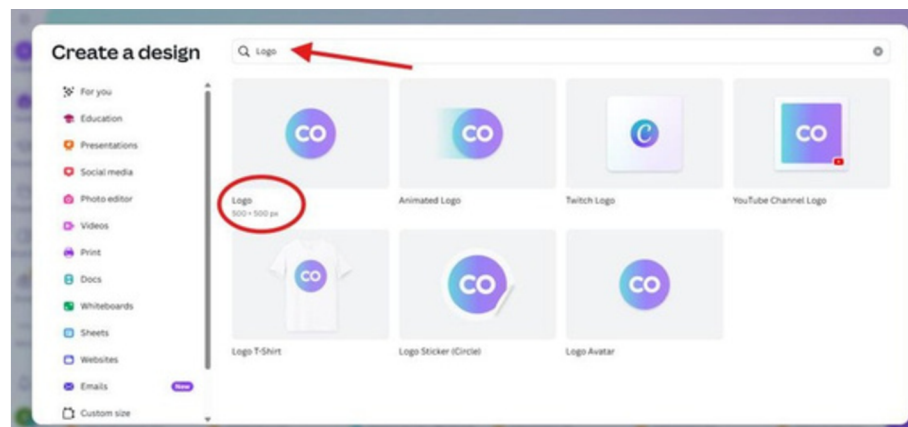


Students can access the Canva platform using their personal email accounts or by creating a shared email account for the entire team.

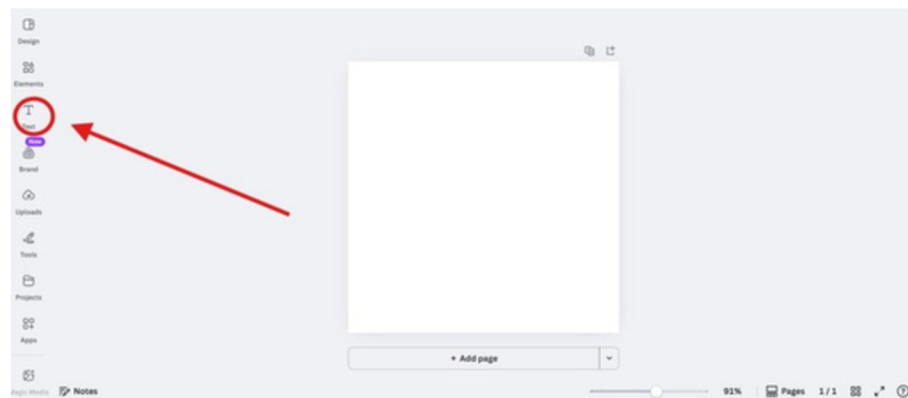
2. In the toolbar on the left side of the screen, click the “Create” button.



3. Select the “Logo” design format.



4. Select a font that reflects the learning business and is suitable for your logo (if the logo includes text).

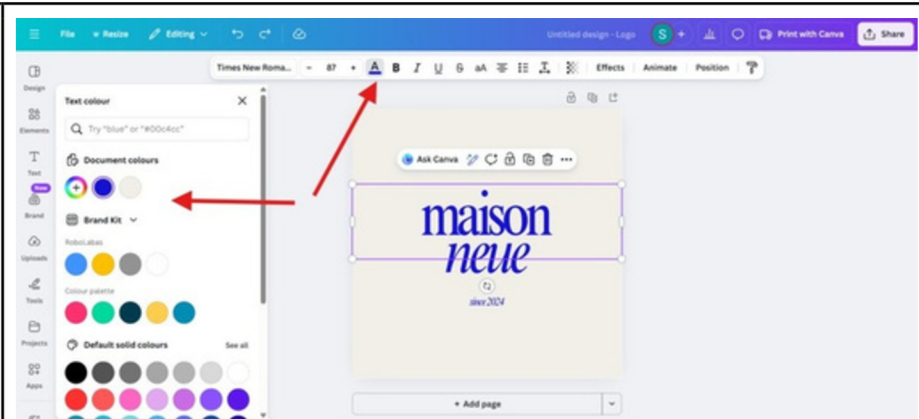


Tips for Choosing a Font:

- **Use only a few fonts** and use them everywhere. Too many fonts can look messy.
- **Choose fonts that match your brand** – for example, playful brands use fun fonts, serious brands use clean and simple ones.
- **Keep it clear and easy to read** – your text should be readable and look the same on posters, slides, or social media.
- Select colours and symbols that reflect the learning business. It is recommended to use the worksheet “*Learning Business Logo*” (Annex 15) to guide your choices.

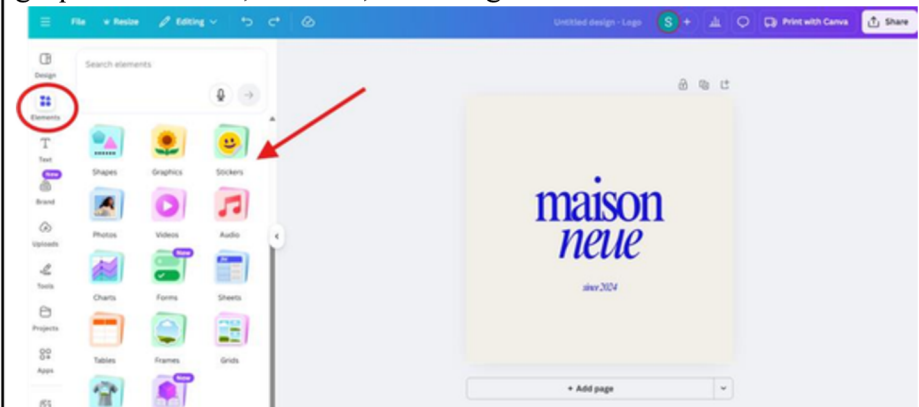
Text Colour Selection.

- 6.

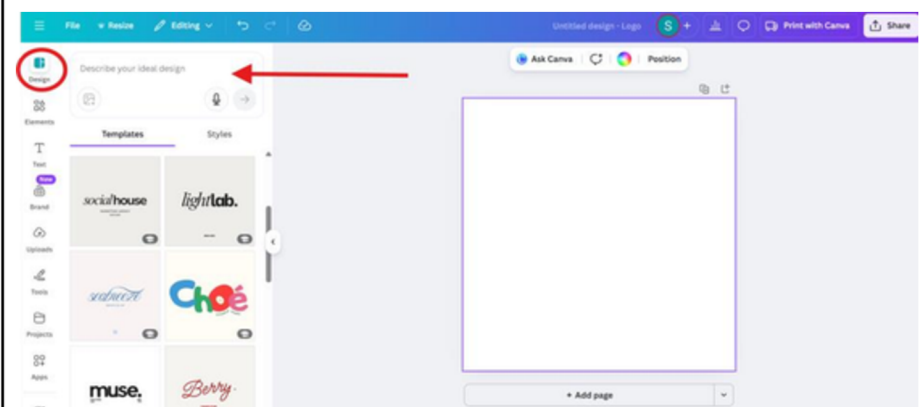


7. Symbol Selection.

Select suitable symbols for your logo using the “Elements” section. You may choose from a wide range of options, including shapes, graphic elements, stickers, and images.

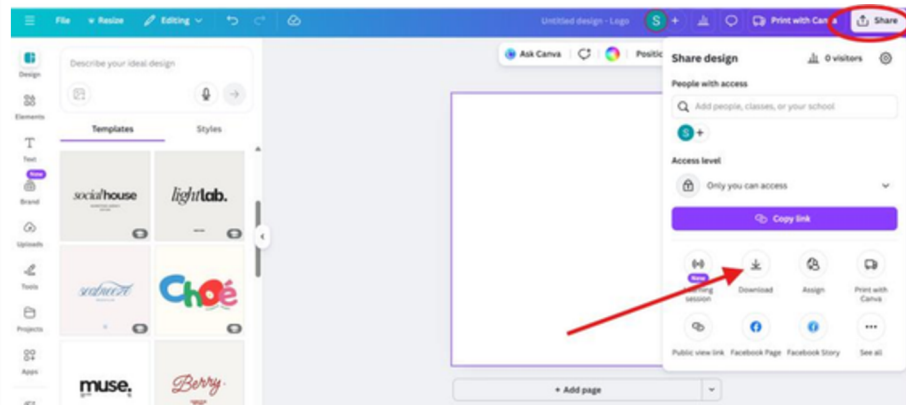


8. Use the logo design templates provided by Canva and adapt them to fit your learning business idea. You may also describe your desired design in the “Describe your ideal design” section; the platform will then generate visual suggestions based on your description.

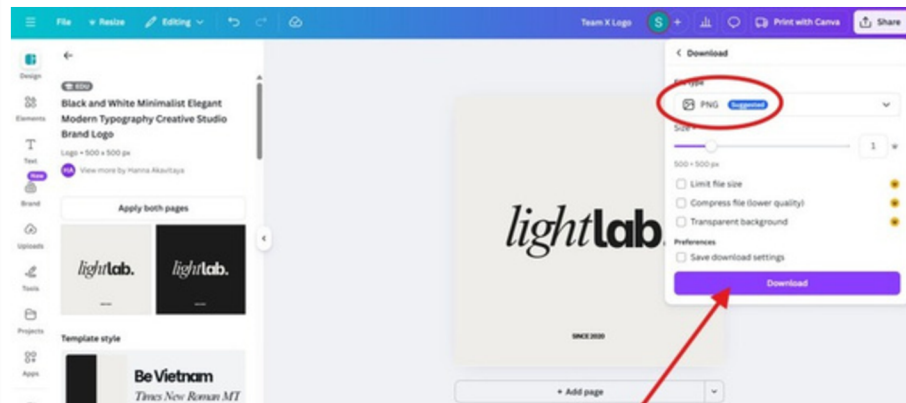


9. Create at least two logo versions. Experiment with different colour combinations and adjust the placement of symbols and fonts.

10. Save your logos and download them in .PNG format.
11. Click the “Share” button, then select “Download”.



12. Select the PNG format and click the “Download” button.



5. Reflection (5 minutes)

While reflecting on their experience, each team member briefly responds to three questions (in writing or orally):

1. What do I like most about our logo?
2. What would I like to improve?
3. Does our logo help to understand what we are creating and who it is intended for?

Assessment and Self-Evaluation

Proposed evaluation criteria for the logo design task:

Assessment Criteria		
3 pt.	Connection to the Learning Business and the Problem	The logo clearly reflects the theme of the developed product or service and the problem it aims to solve.
2 pt.	Clarity and Readability	The text is easy to read, and the logo is clear and recognisable in both large and small formats.
3 pt.	Use of Colours and Symbols	The chosen colours and symbols form a coherent whole. Their meanings are well justified and

		clearly explained by the students.
	2 pt. Teamwork	All team members participated in idea generation and logo creation. Decisions were made collaboratively.
Learning Competences	The activity fosters creativity, digital competence, and communication skills by encouraging students to express ideas visually, make deliberate design choices, and collaborate effectively as a team.	
Notes	It is recommended that teachers prepare several examples of different logos in advance, related to STEAM, sustainability, or social innovation. If some students have weaker IT skills, it is useful to appoint an “IT helper” from among more experienced peers. As the students will present their logo to an international audience, it is recommended that the text included in the logo (if applicable) be in English.	

Lesson 2. Poster Design in “Canva”

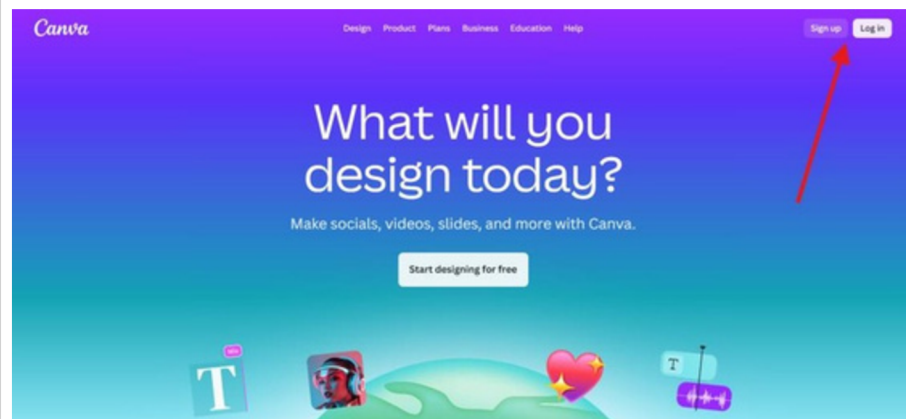
Topic	Poster Design in “Canva”
Duration	45 minutes
Materials	1. Computers or tablets with internet access. 2. Access to Canva. 3. Projector or interactive whiteboard. 4. Worksheet <i>“Visual Communication of a Learning Business”</i> (Annex 16).
Aim and Objectives	Aim: To support students in structuring and visually presenting the value proposition of their learning business in the form of a poster, applying basic principles of graphic design and marketing. Objectives: 1. To identify the key message the team intends to communicate to the target audience. 2. To plan the content and structure of the poster. 3. To design a poster in Canva, integrating the team’s logo and a consistent visual style. 4. To evaluate whether the created material is clear, visually engaging, and suitable for use at events and on social media.
Outcome	By the end of the lesson, the team will have created a poster presenting their learning business.

Activity Procedures	This lesson focuses on visualising the content of a learning business, helping students select the most important information and present it in a way that allows the audience to quickly understand the problem addressed by their product or service. A poster is a visual communication tool that presents key ideas in a clear, concise, and engaging way. It is important because it helps communicate a message quickly, attracts attention, and makes complex information easier to understand. A well-designed poster adds value by strengthening communication skills, supporting creativity, and effectively representing an idea, product, or project to an audience. 1. Poster Content Planning (10 minutes) Key Information to Include in the Poster: ● Business name and logo. ● Product or service (what is being offered). ● Problem the product solves. ● Target audience (who the product is for). ● Unique value / key benefit (why this product is special). ● Main message or slogan. ● Sustainability, values, or origin if relevant. Using the materials from previous modules, students select and organise the key information needed to create a poster that visually represents their learning business. Students complete the task “Visual Communication of a Learning Business” (Appendix 16) and identify the following elements: 1. Business logo. 2. The problem being addressed. 3. The product or service (solution). 4. Target user. 5. Benefit for the user – how the product or service helps. 6. Product or service uniqueness – what makes the idea special or different. 7. Key value created. 8. Main visual elements (colours, symbols, images). This task helps students clearly structure their ideas before designing the final visual materials. 2. Poster Design Using “Canva” (20 minutes) Poster Creation Rules (Design Guidelines): ● Keep the poster clear, simple, and visually balanced. ● Use 2–3 consistent colors that match the brand identity.
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- Choose easy-to-read fonts (no more than 2 font styles).
Headings should be larger and bold, body text shorter.
- Avoid large blocks of text—use keywords and short phrases.
- Use images or icons that support the message.
- Ensure good contrast between text and background.
- Leave white space so the poster does not look crowded.
- The poster should communicate the business idea at a glance.

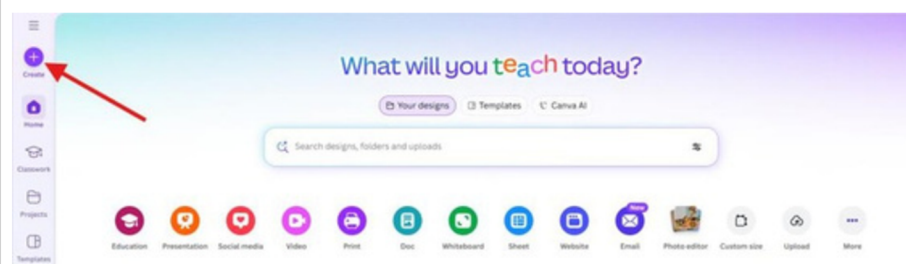
Students follow the poster creation guidelines and begin designing their poster using the Canva platform.

1. Log in to “Canva”.

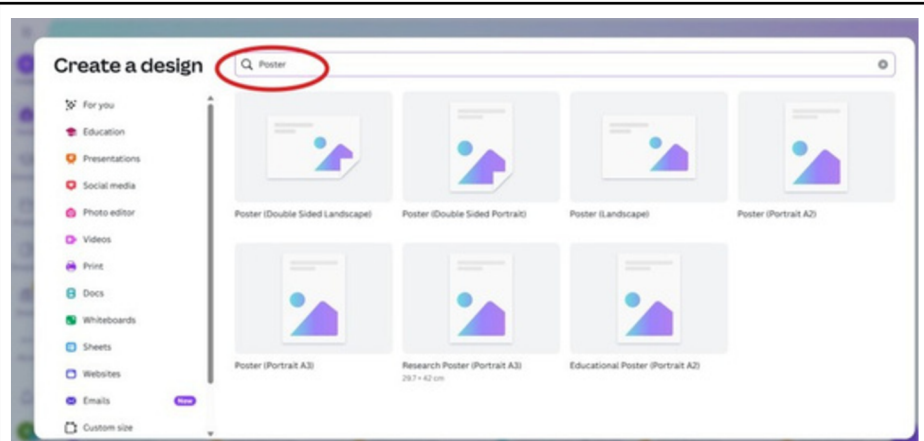


Students can access Canva using their personal email accounts or create a shared email account for the entire team.

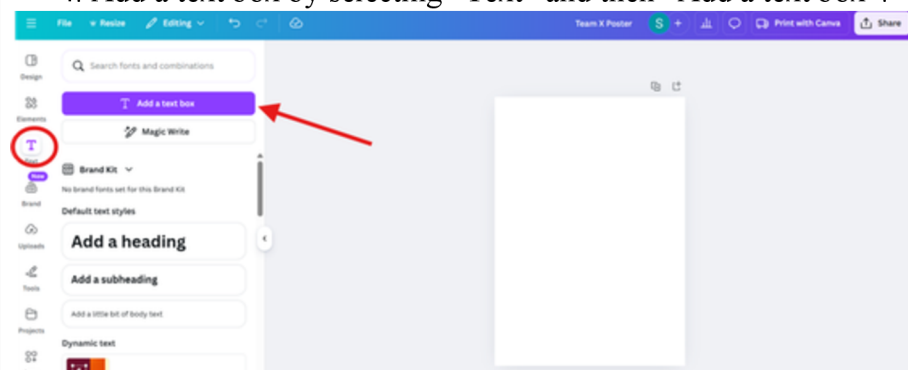
2. In the toolbar on the left side, click the “Create” button.



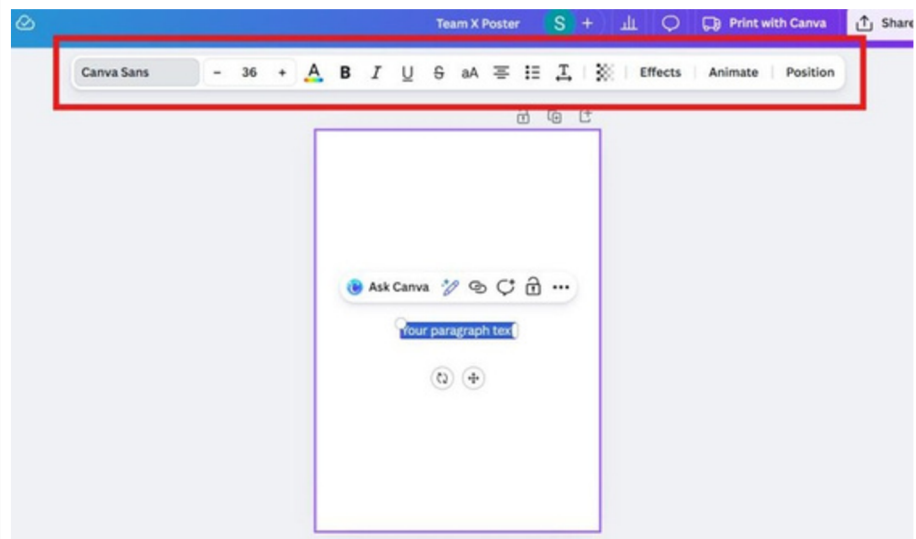
3. Select the “Poster” design format. Choose the preferred layout and size (landscape or portrait, A4 or A3 format).



4. Add a text box by selecting “Text” and then “Add a text box”.

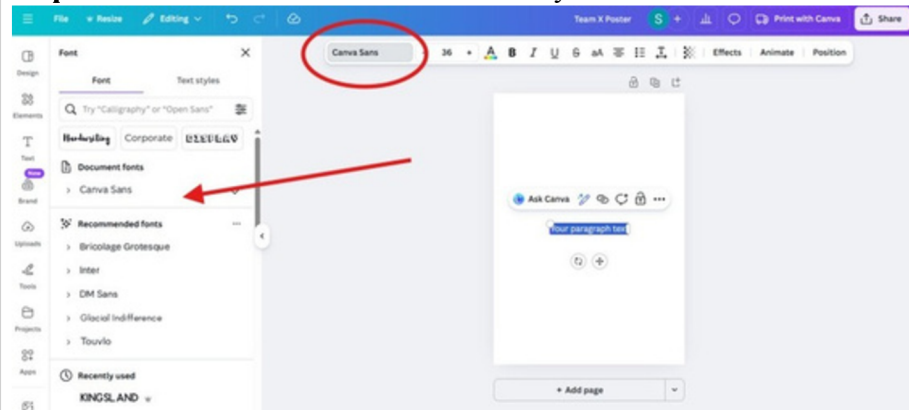


5. Click on the text box; text editing tools will appear at the top of the page. Using these tools, you can adjust the text size, alignment, colour, emphasis, and other formatting options.

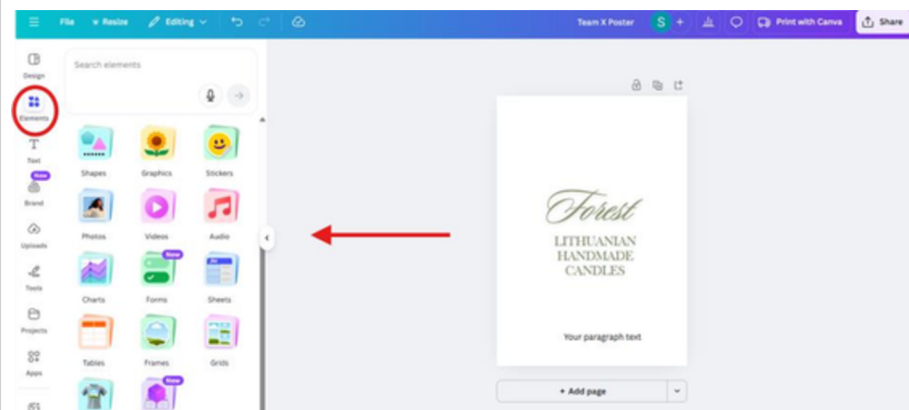


6. When you click on the font selection menu, a list of available fonts will appear on the left. Choose the font that best reflects your business idea. It is recommended to use no more than three different fonts in the design.

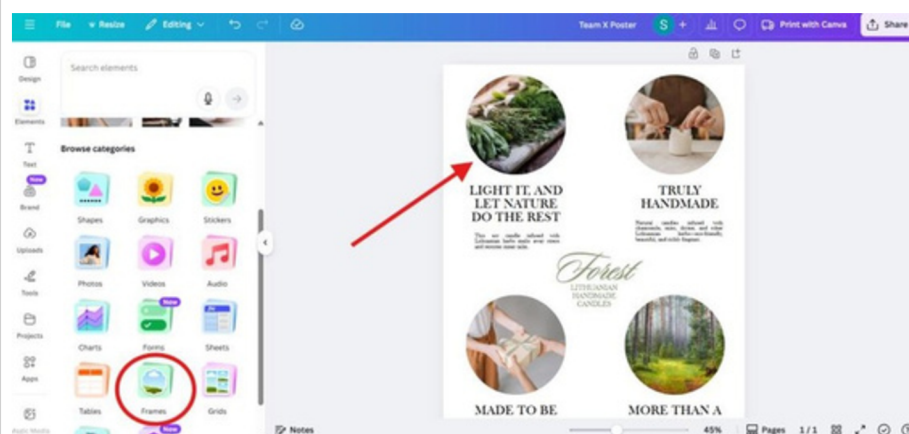
Important: the font must be clear and easy to read.



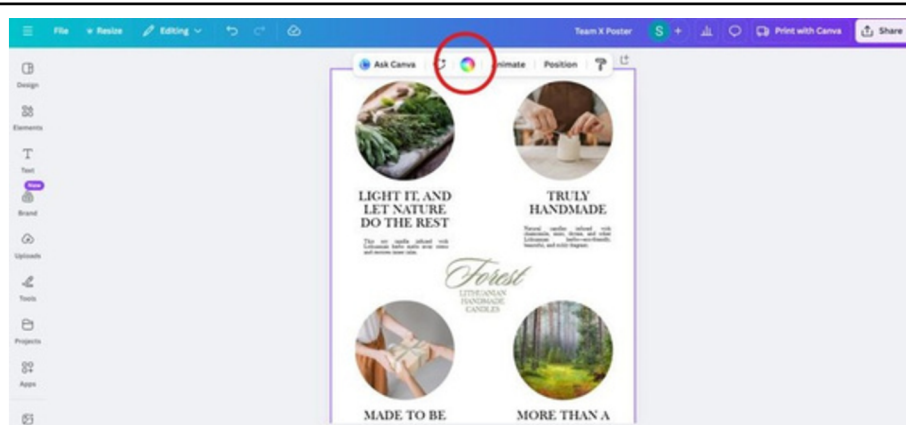
7. Enhance the poster design by adding elements that represent your product or service and complement the poster's text.



8. For a clean design, place photos and graphic elements within frames.

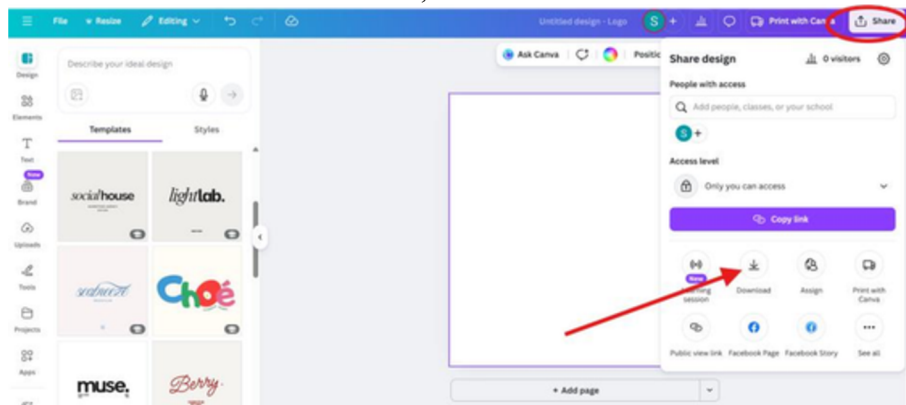


9. To change the background colour, click anywhere on the design with the left mouse button. Then, in the menu that appears at the top, select the colour change option.

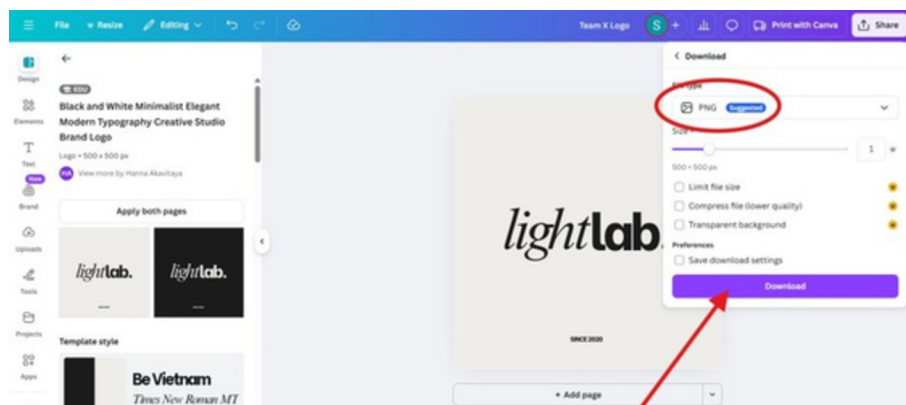


10. Download your poster design in .PNG format.

11. Click the “Share” button, then select “Download.”



12. Select the .PNG format and click the “Download” button.



3. Poster Presentation Within the Team (10 minutes)

Each student presents their created poster to the team members and explains their design choices.

The team selects the poster that best represents their business idea based on the following criteria:

	Assessment Criteria		
	2 pt.	A Clearly Defined Core Message	At first glance, it is clear what product or service is being offered and which problem it addresses.
	2 pt.	Visual Structure and Readability	The information is logically structured, the text is easy to read, and a clear hierarchy is maintained (headline, key information, details).
	2 pt.	Consistency of the Logo and Visual Style	The team logo is used; the colours and fonts are consistent with the logo's visual identity.
	2 pt.	Relevance of the Content to the Target Audience	The text is written in language that is clear and appropriate for the target audience, with an emphasis on aspects that matter to the user (benefits, convenience, sustainability, etc.).
	2 pt.	Language Accuracy	The text is free of obvious language errors and is clear and grammatically accurate.
4. Reflection (5 minutes) Teacher asks team members to individually reflect and then discuss as a group: 1. What was the strongest element of our poster and why? 2. What challenges did we face while creating it? 3. How well did we collaborate as a team? 4. What is one improvement we would make if we had more time?			
Assessment and Self-Evaluation	Students evaluate the posters using the previously provided assessment criteria and reflect on their experiences during a reflection activity.		
Learning Competences	Digital literacy, communication, creativity, and civic (social awareness) competences, including the ability to convey socially relevant ideas clearly, accurately, and in an engaging way.		
Notes	As the students will present their poster to an international audience, it is recommended that the text (or part of the text) be presented in English. This will enhance the accessibility and relevance of the material for an international audience.		

Lesson 3. Video Creation Using “CapCut” (Optional Lesson)

Topic	Video Creation Using “CapCut” (Optional Lesson)
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Duration	45 minutes (if possible, it is recommended to combine two lessons into a 90-minute session)
Materials	1. Smartphones or tablets with a good quality camera. 2. “CapCut” application installed on the devices (free version). 3. A computer, smartphone, or tablet capable of video editing (preferably one device per student). 4. Team logo (outcome of Lessons 1 and 2). 5. Worksheet “Video Creation Task”. 6. Projector or interactive whiteboard (for teacher demonstration).
Aim and Objectives	Aim: To support students in creating a short video in which team members present their learning business, applying basic principles of audiovisual communication. Objectives: 1. To plan the structure of a short video. 2. To film and edit a 30–60 second video using the CapCut application. 3. To reflect on how video-based tools support clear and engaging presentation of a learning business.
Outcome	By the end of the lesson, teams will have a basic (or fully completed, if time allows) 30–60 second video presenting the team members and their learning business.
Theoretical Background	Video advertising is effective because it delivers visual and audio information at the same time. Young audiences tend to shift their attention quickly, so the opening seconds play a crucial role in determining whether viewers stay engaged. For this reason, video messages are often built around a clear three-part structure: presenting the problem, introducing the solution, and ending with a call to action. In the first part, it is important to create a quickly recognisable situation that shows why the product or service is needed. The second part focuses on demonstrating how the product works in a real context, relying on visual evidence rather than lengthy explanations. The final part—the call to action—brings the message together and gives the viewer a clear next step. The call to action should be brief, specific, and aligned with the goals of the student project. It may encourage viewers to visit the exhibition stand, try the prototype, learn more about the idea, or support the team. This message should appear at the end of the video, together with the logo and a clearly visible or audible statement. From a technical perspective, good lighting, stable framing, and a tidy background are essential, as these elements strongly influence how professional the message appears. The “CapCut” app enables students to carry out basic editing tasks efficiently, such as trimming

	unnecessary footage, adding text, and including music. A minimalist approach works best, since excessive visual effects can reduce clarity and distract from the core message.																				
Activity Procedure	Video communication is a powerful way for a brand to tell its story using visuals, sound, and emotion. It is important because video captures attention quickly, builds trust, and helps audiences connect with a product on a deeper level. A strong brand video adds value by showing personality, teamwork, and purpose—and encourages the viewer to take action. 1. How the Video Should Be Filmed (5 minutes) Students analyze the provided video creation structure. <table border="1"> <tr> <td>Step 1</td><td>Hook (Attract Attention)</td></tr> <tr> <td colspan="2"> Start with something eye-catching: • a striking product shot • an emotional moment • a relatable problem • a question or bold/interesting statement </td></tr> <tr> <td>Step 2</td><td>Introduction</td></tr> <tr> <td colspan="2"> Who are you? (team name or members) What product did you create? </td></tr> <tr> <td>Step 3</td><td>Problem & Value</td></tr> <tr> <td colspan="2"> What problem does your product/service solve? How does it help people? What value or feeling does it create? </td></tr> <tr> <td>Step 4</td><td>Product Showcase</td></tr> <tr> <td colspan="2"> Show the product/service clearly Highlight what makes it special (materials, origin, sustainability, design) </td></tr> <tr> <td>Step 5</td><td>Call to Action</td></tr> <tr> <td colspan="2"> End the video with a clear call to action, for example: • “Try it yourself” • “Choose natural, choose local” • “Support handmade products” • “Learn more” • “Bring nature into your home” </td></tr> </table>	Step 1	Hook (Attract Attention)	Start with something eye-catching: • a striking product shot • an emotional moment • a relatable problem • a question or bold/interesting statement		Step 2	Introduction	Who are you? (team name or members) What product did you create?		Step 3	Problem & Value	What problem does your product/service solve? How does it help people? What value or feeling does it create?		Step 4	Product Showcase	Show the product/service clearly Highlight what makes it special (materials, origin, sustainability, design)		Step 5	Call to Action	End the video with a clear call to action, for example: • “Try it yourself” • “Choose natural, choose local” • “Support handmade products” • “Learn more” • “Bring nature into your home”	
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Step 5	Call to Action																				
End the video with a clear call to action, for example: • “Try it yourself” • “Choose natural, choose local” • “Support handmade products” • “Learn more” • “Bring nature into your home”																					

2. Create a Video Script (7 minutes)

Students should plan their video carefully by writing their ideas in a worksheet „[Video Creation Task](#)“ (Annex 17) within **20 minutes**.
Include the following:

- Opening hook
- Introduction
- Problem and Value
- Product/service showcase
- Call to action

Divide responsibilities among team members by deciding who will speak and appear in the video; the video may feature one team member or several, depending on your chosen approach.

The video should be short, engaging, and meaningful (30–60 seconds).

3. Video Recording (10 minutes)

Students record video footage according to their prepared script, ensuring that the material clearly presents both team members and the product. The recorded clips should support the intended message, reflect the brand values, and provide sufficient visual content for subsequent editing.

Filming Recommendations

- Use a smartphone or tablet with a functioning camera and sufficient storage.
- Keep clips short and dynamic.
- Film in good lighting.
- Use calm and steady shots.
- Speak clearly and confidently.
- Match music to the mood of your idea.
- Don't overload the video—simple is stronger.

3. Edit the Video Using „CapCut“ (20 minutes)

The teacher demonstrates how to perform the basic video editing steps using the “CapCut” application. “CapCut” can be conveniently used on both mobile devices and computers. Choose the method that is most suitable—for example, the teacher may demonstrate the editing process on a computer, while team members follow the same steps using their personal smartphones or tablets.

Ensuring that all students have access to the video editing materials is essential, so it is recommended to share the video files with all students

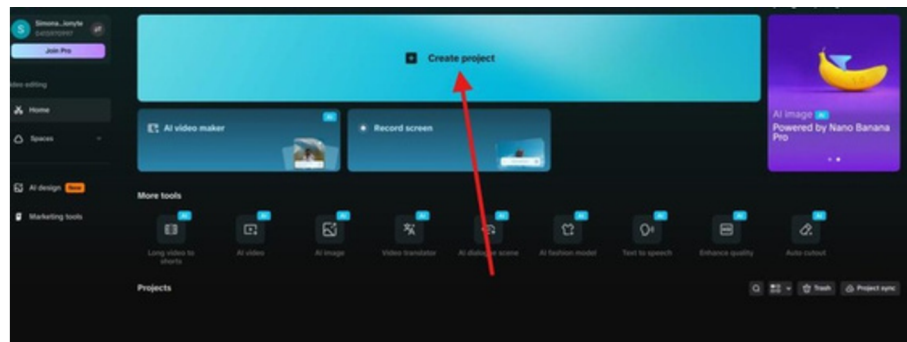
before beginning the editing activity. Alternatively, the task may be carried out in teams of one to two students.

1. Download the “CapCut” application to your phone, computer, or another device..

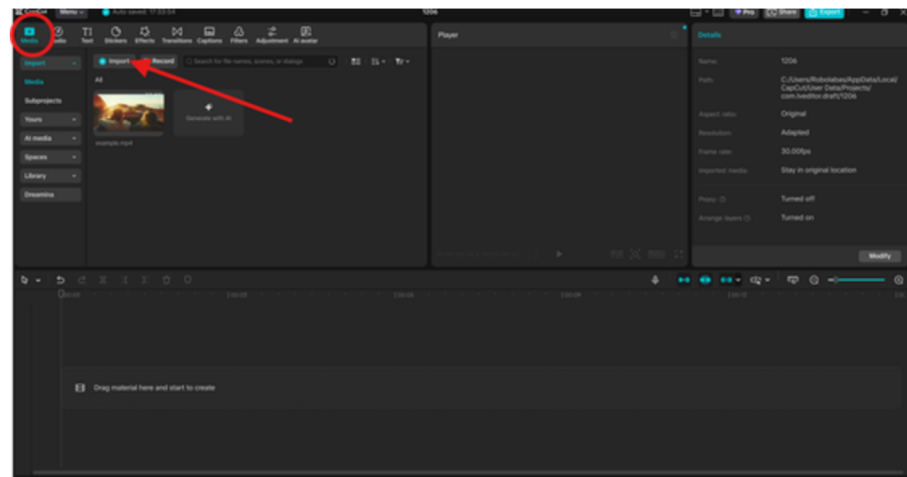


An example of the application logo.

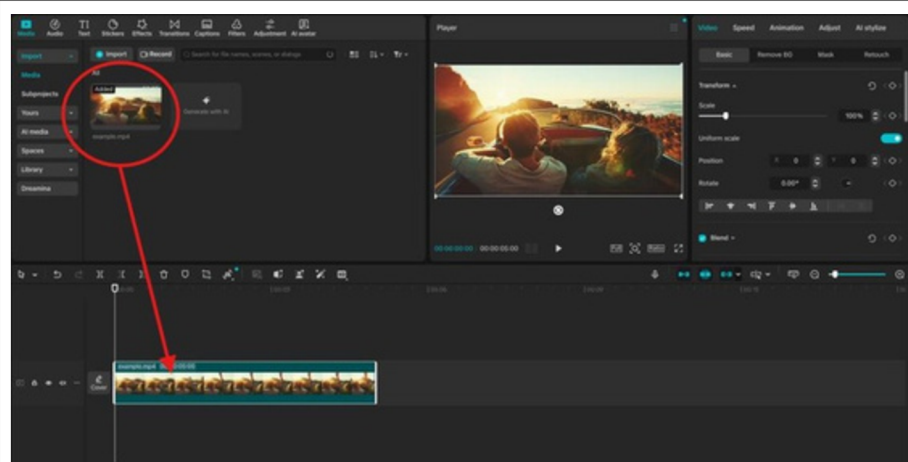
2. Log in to the application using an email account.
3. Start a new project by clicking the “Create project” button.



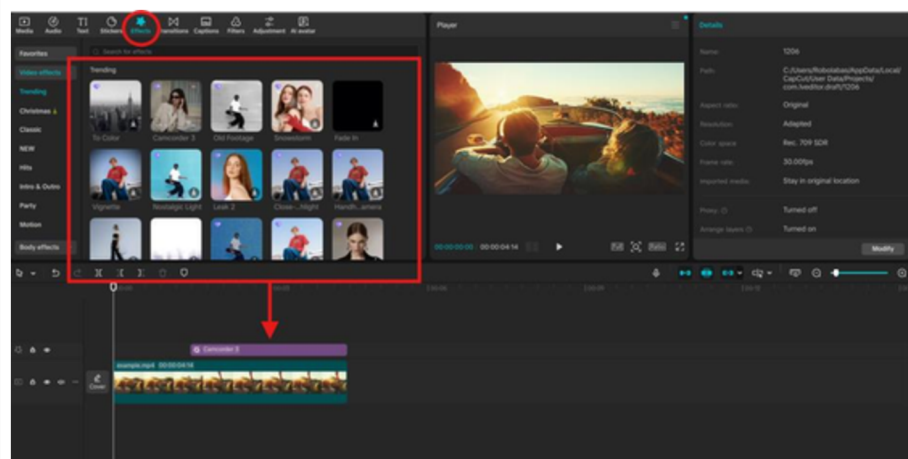
4. Upload the required video clips by selecting “Media” in the upper left corner and then choosing “Import.”.



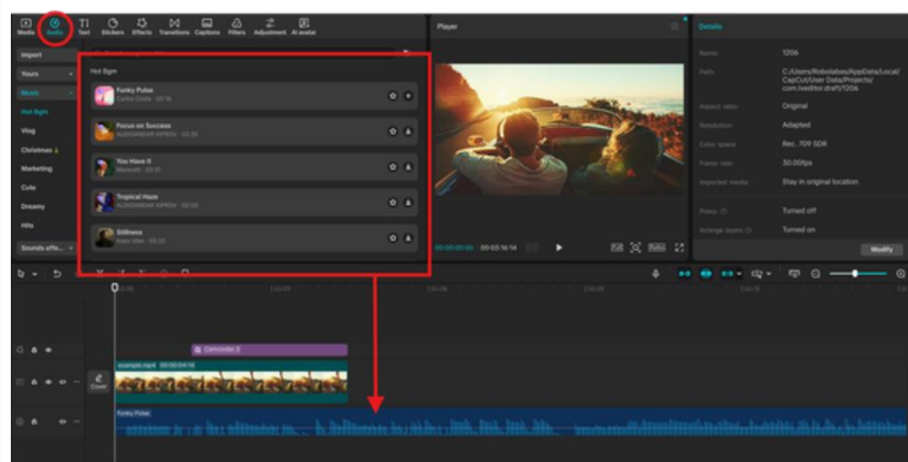
5. To begin the editing process, drag the selected video clips down into the editing workspace (timeline).



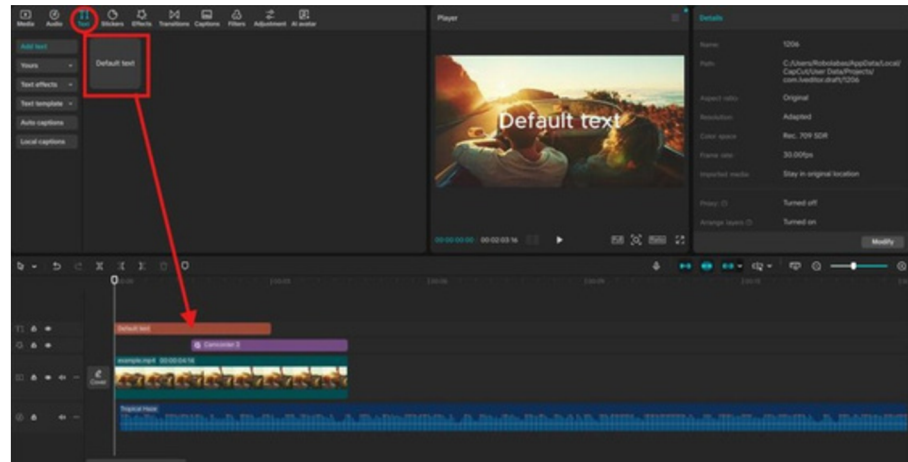
6. To add visual effects, select the “Effects” option in the top toolbar. Drag the chosen effect down into the editing workspace (timeline).



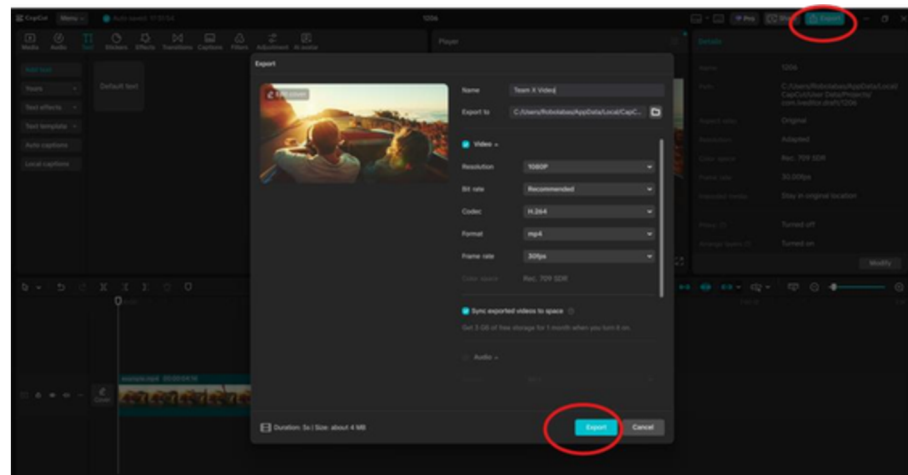
7. To add an audio track, select the “Audio” option in the top toolbar. Drag the selected audio track into the editing workspace (timeline).



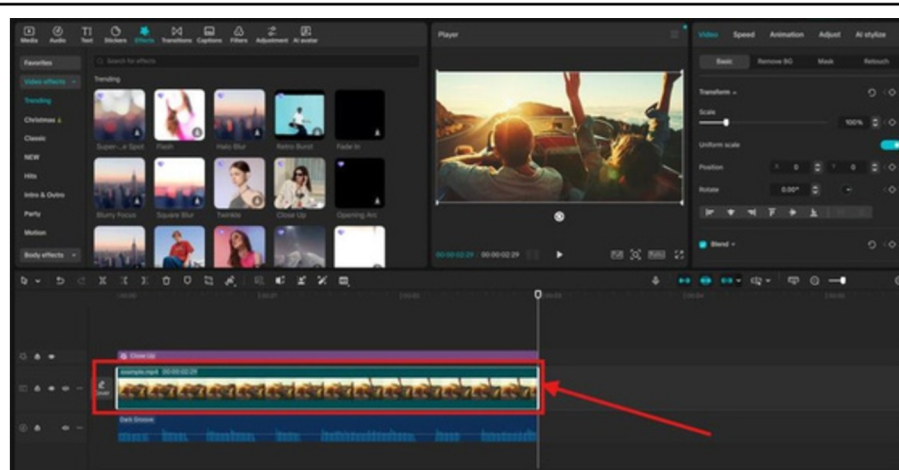
8. To add text, select the “Text” option in the top toolbar. Drag the text box into the editing workspace (timeline).



9. Save the video by clicking the “Export” button located in the upper-right corner.



10. To trim a video, tap on the clip in the timeline to select it, then drag the white handles at the beginning or end of the clip to remove unwanted parts; preview the video to check the changes and repeat the process for other clips if needed.



More information on how to use the CapCut application can be found here: https://www.youtube.com/watch?v=j5_471mO14c

4. Reflection (3 minutes)

The teacher guides a short reflection by asking the following questions:

1. What was the easiest and most challenging part of creating the

video?

2. What elements could be improved (script, sound, or visuals)?

3. How well did you follow the planned structure and intended duration?

Assessment and Self-Evaluation

The video assessment criteria are presented in the table below.

Assessment Criteria		
3 pt	Content Structure	The video demonstrates a clear and logical structure, including an introduction, identification of problem, description of the proposed solution, explanation of its benefits, and a clearly stated call to action.
2 pt	Clear Speech and Audio	Speech is clear and intelligible, and the audio quality is adequate, with no dominant background noise that interferes with understanding.
3 pt	Visual and Text Alignment	The visual elements effectively support the communication of the message by presenting the product or service, the team, and/or the operating process, with the logo clearly visible in at least one scene or in the closing frame of the video.
2 pt	Team Contribution	The video creation process reflects the active involvement of all team members through their participation in presenting, filming, editing, and/or planning activities.

	Students reflect on their experience during the reflection activity described in the “Activity Procedure” section.
Learning Competences	Digital literacy, communication, creativity, and social and personal competences, including the ability to present ideas publicly, work collaboratively, and plan and implement a creative project from initial idea to final outcome.
Notes	It is recommended to organise this lesson as a double session (2×45 minutes), if the timetable allows, in order to provide students with sufficient time for filming and editing. If only a single lesson is available, part of the editing process may be assigned as homework or continued in a subsequent session. This lesson is optional for all teams and may be implemented based on available time, resources, or the teams’ needs and interests.

3.5. Module V

International STEM Innovation Fair

The final stage of the project is dedicated to presenting student-developed STEM projects and the products or services created within them to an international audience, including project partners from all participating countries. The developed outcomes will be presented during the mobility visit to Poland at the International STEM Innovation Fair.

During the fair, students are expected not only to present their product or service, but also to demonstrate collaborative work, reflect on their learning experience, and evaluate their performance. This reflection should address successful aspects of the project, challenges encountered, and the knowledge and skills gained throughout the process.

Organisation of the International STEM Innovation Fair

1. Exhibition Stand

Each team will prepare an exhibition stand presenting its project and the related product, service, or prototype. The exhibition stands will be accessible to other student teams, teachers, and members of the host organisation's community.

Each exhibition stand must include:

1. A product, service, or prototype that visitors can observe, handle, or test. If a final version is not available, a prototype must be provided.
2. A poster designed to clearly communicate the main idea and objectives of the project. Teams must use the poster created in Module IV, Lesson 2.
3. At least one team member present at the stand to explain the project and its outcomes.

2. Project Presentations

In addition to the exhibition stands, students will prepare structured presentations of their projects for other participating teams. These presentations form the central component of the International STEM Innovation Fair.

Required Structure of the Presentation

1. Introduction

The presentation should begin by:

- Identifying the problem addressed by the STEM- or engineering-based product or service.
- Briefly presenting the developed solution and its relevance to the identified problem. (Module II, Lesson 1)

2. MainSection

This part should demonstrate the progression from problem identification and idea development to the final outcome. Teams should briefly address:

1. Project and organisational planning, including the main idea, proposed solution, uniqueness, value proposition, team roles, and the defined user profile (Module II, Lessons 1–2).
2. Financial planning, providing an overview of the key cost and revenue elements (Module II, Lesson 3).
3. The development process, outlining the main stages of creating the product or service and reflecting on how these stages were implemented (Module III).

3. Conclusion

In the final section, teams should reflect on:

1. The learning outcomes achieved.
2. The challenges faced and how they were addressed.
3. The potential impact of the developed solution on users or the wider community.

Teams are encouraged to include a short video presenting their product or service (Module IV, Lesson 3). As this task was optional, teams that did not create a video may omit this element.

Lesson 1. International STEM Innovation Fair: Planning

Topic	International STEM Innovation Fair: Planning
Duration	45 minutes
Materials	1. Computers or tablets with internet access. 2. Task sheets and documents from previous modules (II, III, IV), including the business plan, financial plan, product development descriptions, and visual materials.

	3. Projector or interactive whiteboard. 4. Materials for creating the presentation plan (if an online option such as Google Docs or another digital tool is not used), such as A4/A3 sheets, sticky notes, markers.
Aim and Objectives	Aim: To support students in selecting, justifying, and organising key content for their International STEM Innovation Fair presentation. Objectives: 1. To familiarise students with the structure of the presentation. 2. To identify essential content from Modules II–IV for inclusion. 3. To assign team roles and responsibilities. 4. To develop a structured content plan to guide slide preparation.
Outcome	By the end of the lesson, students will have a clearly defined presentation structure, assigned responsibilities and a completed content “map” prepared on an A4/A3 sheet or in a digital format.
Theoretical Background	Presentation logic is typically organised into three main parts: ● the introduction, ● the main section, ● and the conclusion. The introduction serves an orienting and motivating function. Within the first few seconds, the audience decides whether the presentation is relevant to them. For this reason, it is important that teams clearly identify the problem faced by the community or society and briefly present their business idea as a response to that problem. An effective introduction may include a question, a real-life situation, or a short fact that helps the audience relate to the issue or recognise it in their own context. The main section should be structured in a way that allows the audience to clearly follow the transition from the identified problem to the proposed solution and to understand the reasoning behind it. In this project, this requires a concise presentation of the core elements of the business plan (the problem, target group, and value proposition), the product or service development process (the stages from initial idea to prototype), team members’ roles, and the financial plan. From a theoretical perspective, this approach reflects a coherent and well-reasoned narrative model, in which each part builds on the previous one and reinforces the central idea of the presentation. The conclusion serves a reflective and summarising function. It helps the audience connect the presented information with a broader context by addressing what the team learned, which challenges were overcome, and what impact their idea could have on users or the community. From a learning perspective, reflection in the conclusion is particularly

	important, as it demonstrates that students not only developed an idea but are also able to evaluate it critically.
Activity Procedures	1. Introductory Explanation of the International STEM Innovation Fair (5 minutes) The teacher outlines the context of the fair. 2. Structure of the Presentation (10minutes) The teacher explains the content of the presentation and discusses it with the students. The presentation consists of three parts: • the introduction (problem statement, idea, and business name), • the main section (business plan summary, team member introductions, financial plan, and stages of product/service development), • the conclusion (self-assessment and reflection). 3. Team roles (5 minutes) The teacher asks team members to agree on individual responsibilities for specific parts of the presentation. For example: • <i>Student 1</i>: Introduction of the presentation (Module II, Lesson 1) • <i>Student 2</i>: Business plan overview (Module II, Lessons 1–2) • <i>Student 3</i>: Financial plan (Module II, Lesson 3) • <i>Student 4</i>: Presentation of product/service development stages (Module III) • <i>Student 5</i>: Visual communication (logo, poster, video) from Module IV. • <i>All students</i> are responsible for the reflection section, which summarises what the team has learned and the challenges encountered. If a team has fewer members, some roles may be combined. However, each student must have a clearly defined area of responsibility. 4. Collection and Organisation of Content (20 minutes) Each team member is responsible for collecting and preparing information related to their assigned area of responsibility. The information should be relevant and concise. All collected content must be documented in a shared presentation map, which may take the form of an A3-format sheet, or in shared digital tools, such as a collaborative Google Docs file used by the team.

	5. Reflection Activity „Exit Ticket“ (5 minutes) At the end of the lesson, students complete a short “Exit Ticket” before leaving the classroom. In one to two minutes, they answer three questions: 1. One thing they learned today 2. One thing that was difficult or unclear 3. One question or idea they want to explore further
Assessment and Self-Evaluation	Formative assessment is used. The teacher observes whether students can identify key ideas, organise content logically, and clearly divide responsibilities.
Learning Competences	Students develop competences in creativity, communication, entrepreneurship, learning to learn, and teamwork.
Notes	It is important to note that students do not create slides in this lesson. Instead, they work on the content, aiming to build a clear and logical structure for the presentation.

Lesson 2. International STEM Innovation Fair: Presentation

Topic	International STEM Innovation Fair: Presentation 45 minutes
Duration	Computers with PowerPoint, “Canva”, or another presentation tool, a projector or interactive whiteboard, the content “map” created in Module V, Lesson 1, and a timer.
Materials	
Aim and Objectives	Aim: To help students turn structured content into an effective visual presentation and begin developing public speaking skills. Objectives: 1. To understand basic principles of slide design. 2. To create slides for the International STEM Innovation Fair presentation. 3. To learn the basics of public speaking.
Outcome	By the end of the lesson, the team will have prepared the presentation slides, or at least a first draft, and completed a short rehearsal of the presentation.
Theoretical Background	An effective presentation combines two key elements: clearly structured content and a visual design that matches how the audience processes information. People understand information more effectively

	when text and visuals complement each other rather than repeat the same message. For this reason, slides should include only keywords, short statements, and clear, topic-related visuals. Slides are intended to guide the audience, support the speaker's line of thought, and highlight key points. Ideally, each slide should answer one central question: <i>What is the main idea I want the audience to remember?</i> Audience engagement depends not only on content but also on the speaker's posture, voice, and eye contact. An upright yet natural posture, steady breathing, clear articulation, and purposeful pauses help create an impression of confidence and competence. Eye contact builds a connection with the audience and allows the speaker to see whether listeners are following the message. It is important for students to understand that slides are a support tool, not a shield. They should not be read word for word. The speaker should explain the content in their own words, using slides only as guidance and visual support. An effective presentation often begins with an "attention hook", such as a short question, situation, or striking fact that draws the audience in. The main part should be organised into three to four clear sections. The conclusion should go beyond a simple thank-you and end with one clear message the audience should remember.
Activity Procedure	1. Introductory Activity (5 minutes) The teacher explains that during this lesson students will focus on two parallel tasks: developing slides based on previously selected content and rehearsing their presentation. 2. Selecting a slide template (5 minutes) Each team opens a presentation tool such as "PowerPoint", "Google Slides" or "Canva" and selects a simple, clear template. The teacher reminds students that the template should match the team's visual identity, including the colours used in the logo and poster and the overall style. 3. Development of Presentation Slides (25 minutes) During this activity, each team member develops presentation slides related to their assigned area of responsibility, using the selected presentation template. The focus is on transforming previously structured content into clear, visually coherent slides that support key ideas rather than replicate text

	verbatim. Once individual sections are prepared, all slides are combined into a single, unified presentation. If possible, teams may collaboratively in an online environment, such as „Google Slides“, to ensure consistency and facilitate real-time cooperation. 6. Practice (10 minutes) Each team member presents their assigned section. The teacher asks students to pay attention to: • posture (upright but relaxed), • eye contact (not limited to the screen), • speaking pace (avoiding excessive speed), clarity of sentence structure (clear and concise statements). After each short presentation attempt, the teacher provides one positive observation and one specific, constructive suggestion for improvement (if needed). Students provide peer feedback by reflecting on the contributions and performance of other team members.
Assessment and Self-Evaluation	The teacher applies formative assessment by observing whether the slides are clear and aligned with the content structure. Reflection is carried out after each team member presents their part of the slide.
Learning Competences	Students will develop digital literacy, visual communication, public speaking, communication, entrepreneurship, and collaboration skills.
Notes	If the presentation is not completed during the lesson, students should complete their part of the presentation as homework.

Lessons 3–5

Topic	Virtual Mentoring
Description	Lessons three to five are conducted online and form a three-stage mentoring cycle. These sessions play a supportive role in the programme, helping students move from an initial prototype idea to a more refined technical solution with guidance from industry professionals.

	The online meetings follow a clear progression. In the first two sessions, students work in field-specific groups focused on different technologies. The final session brings all teams together for a joint discussion related to the International STEM Innovation Fair. Meeting language: English.
Meeting I. Initial Mentoring Session	Prior to the first mentoring meeting, student teams submit a brief written overview of their project idea by email to the programme manager. This meeting is held after the completion of Modules I and II, when teams have developed a clear project concept but have not yet created a final product or service. Teams may be at the initial stage of Module III, but not at its completion. Based on the themes, technologies, and project directions described in the submitted emails, the Panevėžys STEAM Open Access Centre assigns each team to a mentor according to the relevant field of work. IT and robotics projects are mentored by the Head of the IT and Robotics Laboratory; chemistry- and biology-based projects are mentored by the Head of the Chemistry and Biology Laboratory; physics-related projects are mentored by the Head of the Physics Laboratory; and AI-related projects are mentored by the Head of the Artificial Intelligence Laboratory. During the meeting, teams present their planned solution, outline what they intend to develop, and discuss the expected application of technologies. Mentors provide expert feedback aimed at refining the idea, identifying potential challenges, and guiding the early development of the project.
Meeting II. Project Development Review	The second mentoring session is held midway through or toward the end of Module III, once teams are actively working on development. During this meeting, teams share their progress, present interim results, and discuss challenges with their assigned mentor. The session centres on a detailed review of the project's technical development, functionality, and overall feasibility. Mentors offer focused feedback and practical recommendations to help teams refine their product or service and stay aligned with their project goals.
Meeting III. Preparation for the International STEM Innovation Fair	The third mentoring meeting is held after the completion of Module IV and before the start of Module V. This session involves all participating teams and focuses on preparation for the International STEM Innovation Fair.

	During the meeting, expectations related to the International STEM Innovation Fair presentation are clarified, including presentation structure, content requirements, and exhibition standards. Teams discuss how to effectively communicate their project idea, development process, and outcomes in a clear, professional, and engaging manner suitable for an international audience.
Learning Competences	Over the course of these three lessons, students strengthen their engineering and technological skills, learn to use mentor feedback effectively, and build project management, communication, and intercultural skills.

Presentation Evaluation Criteria

Each project presentation is evaluated according to the criteria below.
Each criterion is scored from 1 to 3 points.

Assessment Criteria		
1.	Problem Identification (1–3 points)	1 – The problem is mentioned but is unclear or weakly justified.
		2 – The problem is clearly stated and understandable.
		3 – The problem is clearly defined, relevant, and convincingly justified.
2.	Solution and Product/Service Description (1–3 points)	1 – The solution is described superficially or lacks clarity.
		2 – The solution clearly addresses the identified problem.
		3 – The solution is clearly explained, well justified, and well matched to the problem.
3.	Project and Business Planning (1–3 points)	1 - Project and Business Planning (1–3 points)
		2 – Key planning elements are presented clearly and logically.
		3 – Planning is well-structured, coherent, and clearly linked to the solution.
4.	Financial Planning (1–3 points)	1 – Financial aspects are mentioned but lack clarity or detail.
		2 – Main cost and revenue elements are explained clearly.

		3 – Financial planning is clear, realistic, and logically connected to the project.
5.	Development Process (1–3 points) <i>(from idea to prototype or solution)</i>	1 – The development process is briefly or inconsistently described.
		2 – The main development stages are clearly presented.
		3 – The development process is clearly structured, reflective, and well explained.
6.	Visual Presentation and Structure (1–3 points) <i>(slides, poster, exhibition materials)</i>	1 – Visual materials are present but poorly structured or overloaded.
		2 – Visuals support understanding and follow a clear structure.
		3 – Visual communication is clear, consistent, and professionally designed.
7.	Reflection and Learning Outcomes (1–3 points)	1 – Reflection is present but superficial or descriptive.
		2 – The team clearly reflects on learning outcomes and challenges.
		3 – Reflection is thoughtful, critical, and clearly linked to learning and impact.
Total Score		Maximum: 21 points

Project Nominations

To recognise the diversity, quality, and creativity of the projects presented at the International STEM Innovation Fair, a number of special nominations are awarded. These nominations highlight outstanding achievements in innovation, STEM application, development process, impact, and communication.

1. Best Social Impact

Awarded to the project with the greatest potential to address social challenges or improve quality of life.

2. Best Environmental Impact

Awarded to the project that most effectively addresses environmental challenges or promotes sustainability.

3. Best Use of STEM and Engineering

Awarded for the most effective and meaningful application of STEM knowledge, engineering principles, or technology.

4. Most Innovative Idea

Awarded to the project demonstrating creativity, originality, and innovative thinking.

5. Best Development Process

Awarded for a well-documented, logical, and reflective development journey from idea to solution.

6. Most Market-Ready Idea

Awarded to the project with the strongest potential to be developed into a real, sustainable business or startup in the near future.

The projects will be assessed by an international jury consisting of accompanying team representatives, teachers, and participants attending the final project event.

4. Mobility in Poland

The mobility activity in Poland marks the final stage of the programme. It consolidates the competences developed throughout the previous modules and provides students with an opportunity to apply their knowledge in an authentic international setting. The value of this stage lies in experiential learning, as students engage in real-life situations such as collaborating with peers from other countries, presenting their ideas publicly, and reflecting on a shared creative process.

During the mobility, students strengthen their entrepreneurship, communication, cultural awareness, and technological literacy skills. They learn to justify their decisions with clear arguments, adapt to an international audience, manage more complex collaborative processes, and take responsibility for shared outcomes.

This stage completes the programme cycle by moving from idea development and prototyping to real-world presentation in a multicultural context. The mobility experience enables students to reflect on their personal growth, understand the value of teamwork, broaden their cultural perspective, and see how their creative and technological solutions perform in practice.

Day 1. Community Laboratory

The first day of the mobility focuses on establishing an international learning community and creating a supportive environment for collaboration. Although students have already interacted during the mobility in Lithuania and through online mentoring, face-to-face interaction allows for deeper social bonding.

The day begins with an official meeting of project partners, followed by an overview of the mobility structure and a clear outline of the week's objectives. This structured introduction ensures a common understanding of roles, expectations, and principles of cooperation among all participants.

Following this, students engage in introductory and team-building activities designed to strengthen communication skills, intercultural awareness, and mutual trust. Through interactive tasks, students gain insight into one another's working styles, strengths, and communication preferences, which supports more effective collaboration in the following days.

The day concludes with a non-formal cultural activity, such as a guided walk, a visit to a local cultural site, or a shared interactive task.

Day 2. STEM Activities

The second day of the mobility focuses on familiarisation with the host institution—Szkoła Podstawowa nr 3 im. Henryka Brodatego w Złotoryi—and its educational environment. The

day starts with an orientation tour of the school, during which participants are introduced to its laboratories, technological innovation spaces, workshops, and learning resources.

This is followed by STEM workshops conducted in mixed international teams. The workshops are designed to foster collaborative learning and the application of creative problem-solving approaches, drawing on students' diverse knowledge bases and experiences.

The day concludes with informal interaction between students and the wider school community. Through shared discussions and social exchange with peers and teachers, these activities support relationship building and contribute to the development of intercultural understanding.

Day 3. Preparation for the International STEM Innovation Fair

The third day of the mobility focuses on preparation for the International STEM Innovation Fair. Students begin by familiarising themselves with the presentation venue, including the stand layout, technical equipment, and event structure, ensuring effective use of their assigned space.

Teams then set up their stands by arranging visual materials, preparing prototype or product and service demonstrations, and organising informational content. All presentation materials are tested on the event computers to ensure technical readiness.

In the second half of the day, teams rehearse their presentations, focusing on timing, speaker transitions, and clarity. Teachers provide targeted feedback. The day ends with a final check of stands and equipment to ensure full readiness for the event.

Day 4. International STEM Innovation Fair

In the morning, presentations at exhibition stands are held for the wider school community. Students present their products or services, explain key decisions, and interact with visitors. Community members can test the products and, in some cases, purchase them. This part of the fair provides students with authentic experience in communicating with real users and potential customers.

In the afternoon, teams deliver structured presentations of their learning enterprises. They present their idea, team members, development process, business plan elements, financial calculations, and technological solutions, demonstrating their ability to communicate clearly and persuasively to an international audience.

The International STEM Innovation Fair provides students with practical experience in public speaking, audience interaction. The day concludes with the announcement of nominations and an awards ceremony recognising creativity, technological solutions, design quality, teamwork, and overall presentation quality.

Day 5. Feedback and Programme Conclusion

The fifth day of the mobility focuses on reflecting on the overall programme experience and bringing the international collaboration to a conclusion. The purpose of the day is to help students assess their progress, identify key learning outcomes, and understand how the programme supported the development of their personal and team competences.

At the beginning of the day, students work in international groups to take part in reflection activities and review the programme as a whole. They consider what worked particularly well, which challenges they encountered, and how these were overcome. This process helps students recognise their strengths as well as areas for further improvement. Students also reflect on how working with peers from other countries influenced their views on collaboration, creativity, and possible technological improvements.

5. Annexes

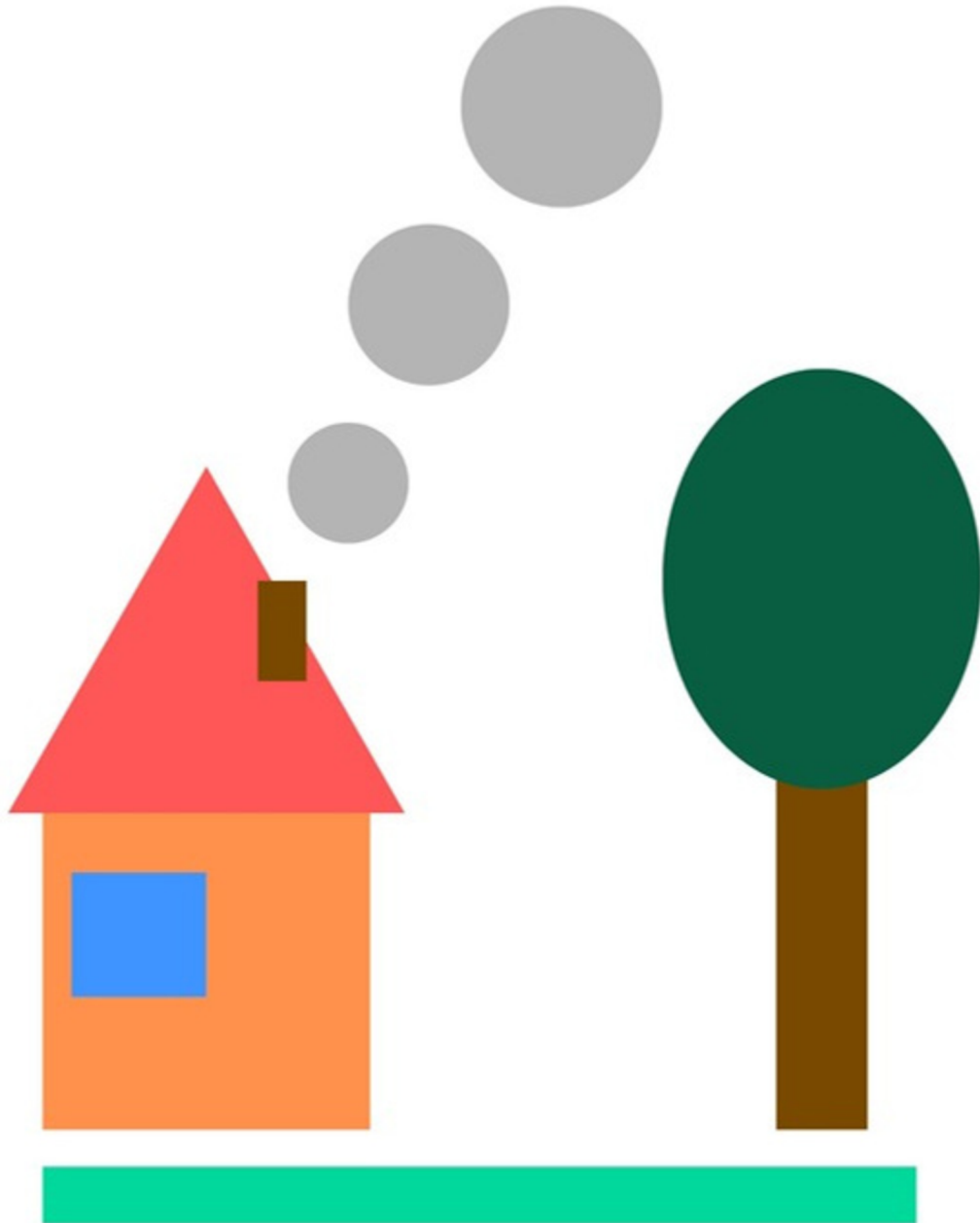
Annex 1. My Personality Profile

My Personality Profile	
Name:	
Date:	
My Personality Type:	
1. My top 3 strengths	1. 2. 3.
2. My 2 areas for improvement	1. 2.
3. I learned that I am someone who...	
4. One trait that I want to strengthen during this programme...	
5. 3 key words that describe me best now:	1. 2. 3.

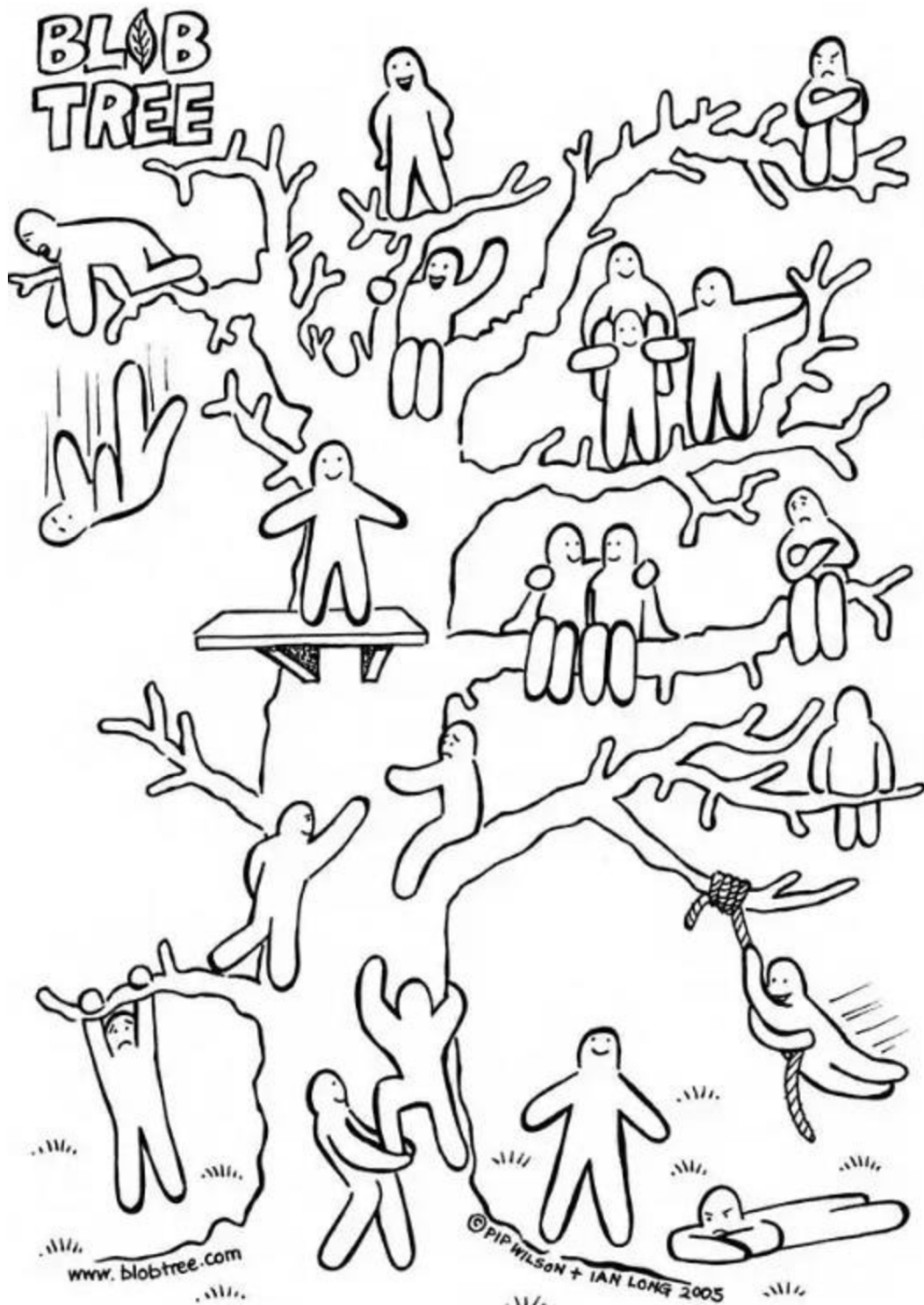
Annex 2. Puzzle Task Variations



Annex 3. Puzzle Task Variations



Annex 4. Blob Tree diagram



Annex 5. Problem and Need Identification

PROBLEM AND NEED IDENTIFICATION



The first step is to recognise an unmet need, a problem that requires a solution, or an opportunity for innovation in the market.

IN DAILY LIFE

Think about your day from morning to evening. Is there anything that regularly causes inconvenience or irritation?

In which situations would you like things to happen faster, more comfortably, or at a lower cost?

IN THE COMMUNITY

What could be changed in your school to make daily life more comfortable and enjoyable for everyone?

Think about the services or activities that your school currently lacks. Is there something that could make students' daily routines easier or make the learning process more engaging?

IN THE WORLD

Which global issues matter to you (e.g., climate change, pollution, inequality)?

How could we contribute to solving these problems, even through small steps?

Annex 6. Idea Workshop

Idea Workshop		
Name and Surname		
Date:		
1. Think and write down the problems you encounter or notice:		
In daily life <i>Think about your day from morning to evening. Is there anything that regularly causes inconvenience or frustration for you?</i> 1. 2. 3.	In the community (at school or in informal environments) <i>Think about the services or activities that are missing in your school. Is there something that could make students' daily life easier or make the learning process more engaging?</i> 1. 2. 3.	In the world <i>Which global issues matter to you (e.g., climate change, pollution, inequality)?</i> <i>How could we contribute to solving these problems, even through small steps?</i> 1. 2. 3.
2. Choose the two most important problems from your list in Task 1.	1. 2.	
3. The problem we will address is...		
4. Our educational business idea is...		

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Annex 7. User Profile Character



USER PROFILE

NAME Justin, 15 years old

LIVES in a small town, attends 9th grade

HOBBIES Plays basketball, enjoys music

FEELS Often tired, finds it difficult to wake up in the morning

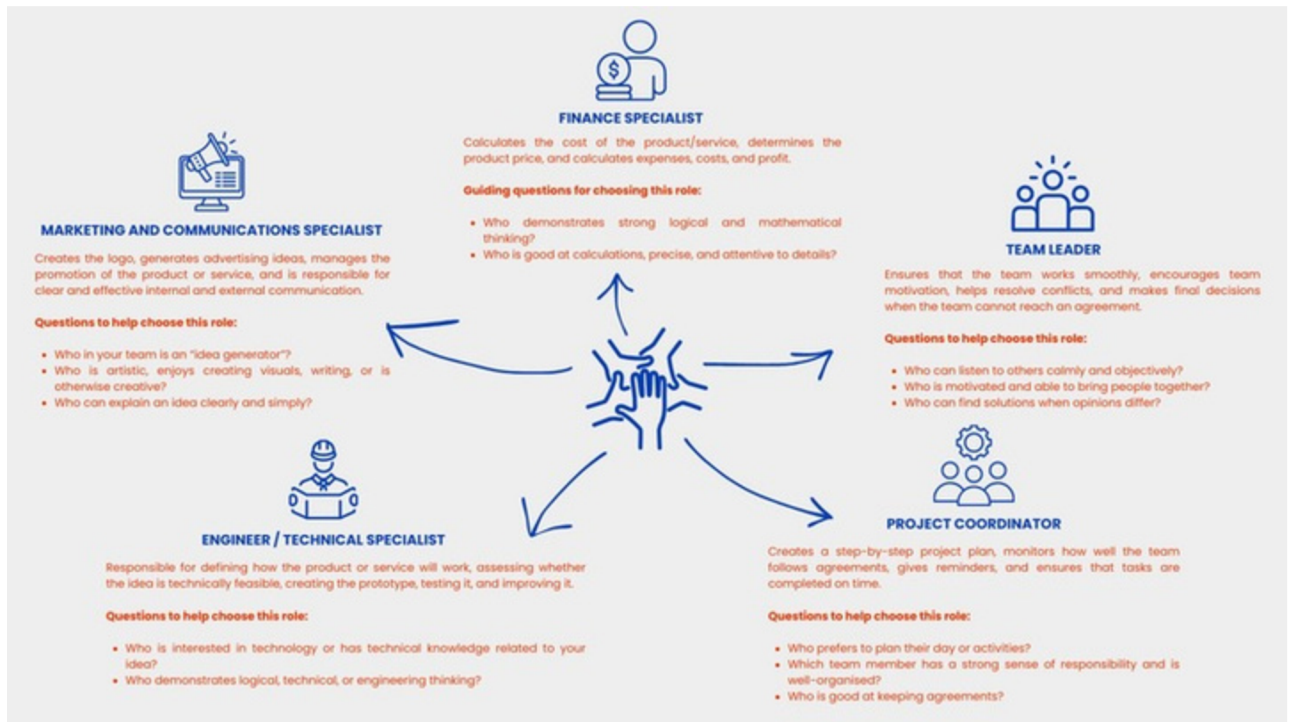
PROBLEM Forgets to drink water and to eat breakfast

WOULD LIKE to have something that reminds him to take care of himself.

Annex 8. How to Create a Good Idea?



Annex 9. Team Member Responsibilities



Annex 10. TeamMember Roles



Annex 11. Financial Analysis of the Business Idea

1. Calculate the costs (production costs) of creating your product or service.

Item No.	Material	Quantity	Unit Price, Eur	Total, Eur	Reference to Source
1.					
2.					
3.					
4.					
5.					
6.					

Costs (or production costs):

2. Calculate the total amount of additional expenses for your product/service.

Item No.	Material	Quantity	Unit Price, Eur	Total, Eur
1.				
2.				
3.				
4.				
5.				
6.				

Total additional expenses:

3. Calculate the total expenses of your product/service.

Total expenses = all costs combined.

4. Calculate the unit cost of your product/service.

Unit cost = total expenses $\div$ number of units produced

5. Calculate the price of your product/service.

6. Calculate the projected monthly revenue for your student business.

Revenue = price $\times$ quantity sold

7. Calculate the projected monthly profit of your student business.

Profit = revenue – total expenses

Annex 12. Example Business Plan

UNIQUENESS

The product combines an emotional experience with the essence of Lithuanian nature. The candle offers not only light and fragrance, but also a sense of nostalgia – summer meadows, calmness, and cultural heritage. Such candles become a symbol of Lithuanian identity and make a meaningful gift for visitors from abroad or for people who feel a connection to their homeland.

USER

- people experiencing emotional tension or stress
- those who value natural products
- Lithuanians living abroad
- tourists looking for locally made handmade items
- individuals seeking symbolic, cosy, and meaningful gifts



PRODUCT

Handmade candles infused with chamomile, mint, thyme, or other Lithuanian herbs. The product is aesthetic, eco-friendly, and pleasantly fragrant.

PROBLEM

People experience a high emotional load and often feel anxiety and stress. They lack calmness, a connection to nature, and moments of relaxation.

IDEA – SOLUTION

To create calming soy wax candles enriched with dried herbs grown in Lithuania. As the candle burns, it releases a gentle, natural aroma. These candles are designed to create a sense of comfort, reduce tension, and evoke a connection to nature.

Annex 13. Colour Meanings

	ENERGY, PASSION, EXCITEMENT, ATTENTION		CARE, WARMTH, PLAYFULNESS
	ENTHUSIASM, CREATIVITY, FRIENDLINESS		REATIVITY, IMAGINATION, LUXURY
	OPTIMISM, HAPPINESS, POSITIVITY		STABILITY, NATURALNESS, EARTHINESS
	NATURE, GROWTH, BALANCE, SUSTAINABILITY		ELEGANCE, STRENGTH, PROFESSIONALISM
	TRUST, CALMNESS, RELIABILITY		SIMPLICITY, CLARITY, CLEANLINESS

Annex 14. Meanings of Shapes and Symbols



Annex 15. Learning Business Logo

Learning Business Logo	
1. Write 3 words that best describe your learning business idea.	1. 2. 3.
2. Identify 2–3 values that you associate with your product or service (e.g. sustainability, convenience, innovation).	1. 2. 3.
3. Choose and write down 2–3 colours that best match your idea. Explain why you chose them.	1. 2. 3. Explanation:
4. Choose and write down 1–2 symbols that best match your idea. Explain why you chose them.	1. 2. Explanation:

Annex 16. Visual Communication of a Learning Business

Using the ideas developed in previous modules, complete the tasks below to plan the content of your learning business poster. Answer each question clearly and briefly.

1. Describe your learning business logo. What does it represent? What idea, value, or message does it communicate? (*Module IV, Lesson 1*)

2. What problem does your product or service solve? Describe the problem in 1–2 clear sentences(*Module II, Lesson 2*)

3. What is your product or service? Explain how it works and how it solves the problem(*Module II, Lesson 1*)

4. Who is your product or service for? Describe your main user (age, situation, needs). (*Module II, Lesson 1*)

5. How does your product or service help the user? What positive impact does it create?(*Module II, Lesson 2*)

6. What main value does your learning business create? (e.g., sustainability, comfort, health, safety, innovation, convenience) (*Module II, Lesson 2*)

7. Which colours, symbols, or shapes best represent your idea? Explain briefly why you chose them.
(Module IV, Lesson 1)

Annex 17. Video Creation Task

1. Decide how your video will attract attention in the first few seconds. Write down what you will show or say (e.g. a product/service/prototype shot, an emotional moment, a relatable problem, a question, or a bold statement).

2. Plan how your team will introduce itself. Write who will appear in the video and how you will present your team and your product, service, or prototype.

3. Describe the problem your product or service addresses. Explain how it helps people and what value or feeling it creates.

4. Plan how you will visually present your product, service, or prototype in the video. Identify the key features you want to highlight, such as function, materials, origin, sustainability, or design.

5. Create a clear call to action for the end of your video. Write one short sentence that encourages viewers to take the next step (e.g. try it, learn more, support the idea, or follow your project).