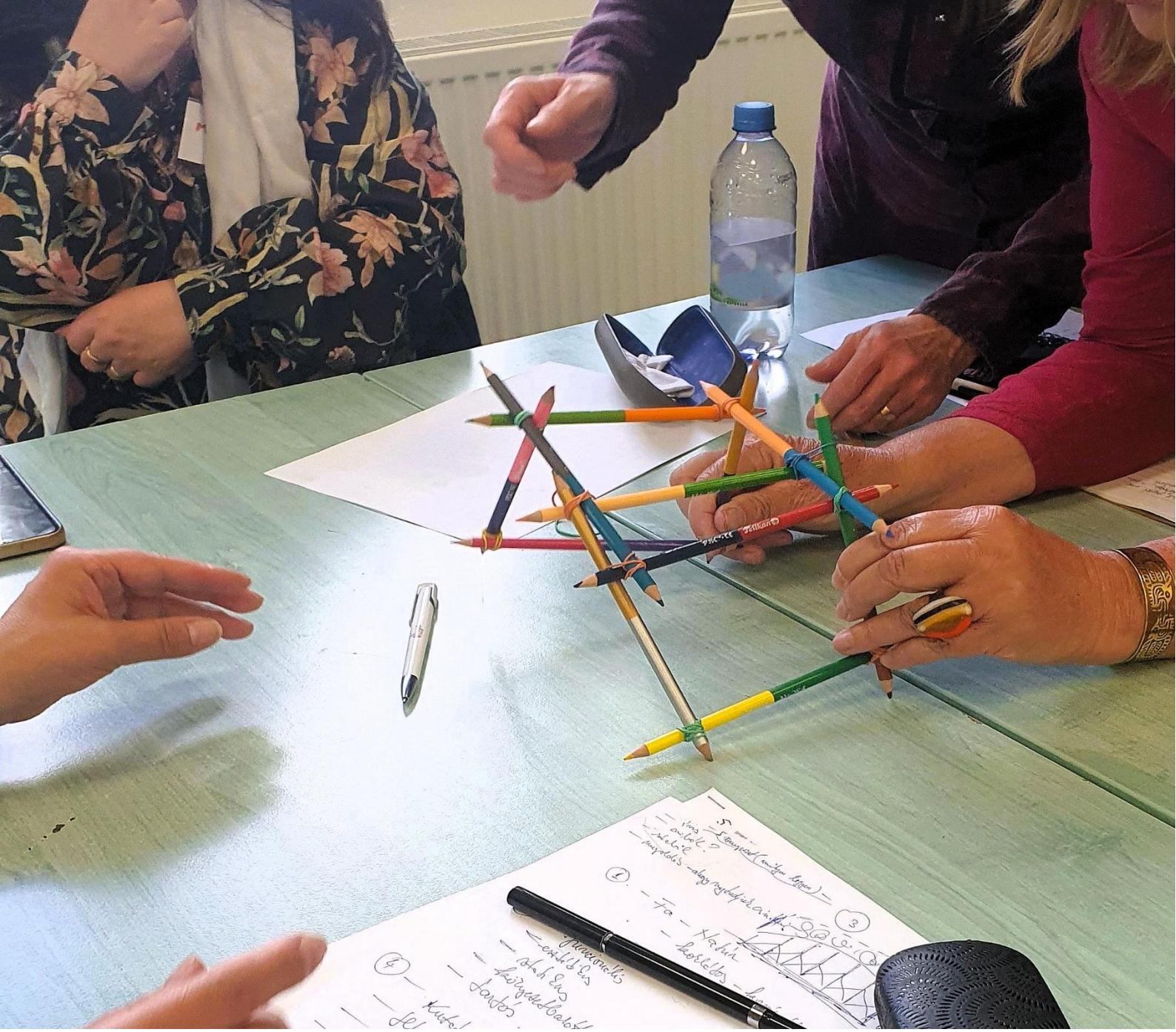

# TRAINING AND LEARNING – IN-SERVICE TEACHER TRAINING

## MODULE 4. – STEAMIFIED TRANSVERSAL SKILLS DEVELOPMENT

## TRAINER MANUAL

Skills of tomorrow for children of present: complex future-skill development with the synergy of learning activities, game-based learning and STEAM
GA Nr. 2023-1-HU01-KA220-SCH-000154457

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# Introduction

Welcome to this SPIRIT training module on **STEAM as an educational approach for developing transversal skills, motivating learners, and teaching content in meaningful ways**.

This module has been designed to help teachers explore STEAM not simply as a set of activities, but as a flexible pedagogical framework that can respond to real classroom needs. Within the SPIRIT project, STEAM is understood as a powerful way to connect learning to authentic real-life situations, engage children actively in the learning process, and intentionally support the development of the 10 SPIRIT Skills.

The module invites you to look at STEAM through both a theoretical and a practical lens. In the preparatory phase, you will explore the evolution of STEAM education, different STEAM lesson approaches, the SPIRIT STEAM Core, the integration of transversal skill development, and the connection between STEAM and curriculum content. During the workshop, you will then experience, analyse, and reflect on STEAM activities from the perspective of both learner and teacher.

Throughout the module, the central focus remains clear: STEAM is not used for its own sake, but as an intentional educational approach that can help teachers motivate students, develop skills, and teach content in integrated, relevant, and engaging ways.

## What to Expect

This module is structured in three parts: **Before the Workshop**, **Workshop Activities**, and **After the Workshop**.

In the **Before the Workshop** section, you will prepare through **Read, Watch, and Do** tasks. These are designed to build a shared foundation before the face-to-face training. In the reading materials, you will explore the evolution of STEAM education, the variety of STEAM approaches, the SPIRIT STEAM Core, the role of STEAM in developing transversal skills, and the integration of STEAM with curriculum content. You will also watch a video and complete preparatory tasks that help you enter the workshop with initial ideas, questions, and reflections.

In the **Workshop Activities** section, you will take part in a series of practical and reflective learning experiences. These activities are designed to help you experience STEAM from the learner's perspective, analyse it from the teacher's perspective, and reflect on how it can be used strategically in your own classroom. You will explore how STEAM activities can connect to real-life problems, how they can motivate students to participate actively, how they can support the development of the 10 SPIRIT Skills, and how they can be linked to curriculum content.

In the **After the Workshop** section, you will be invited to continue reflecting on your learning, connect it to your own teaching practice, and remain engaged with others through ongoing exchange and collaboration.

This module is meant to be practical, reflective, and professionally relevant. It is not only about understanding STEAM conceptually, but about recognising its educational potential and beginning to use it more intentionally in ways that match your needs and your students' needs.

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## Learning Objectives

By the end of this STEAM training module, you will be able to:

1. **Understand the meaning of the STEAM approach** recognizing its relevance to developing children's transversal competencies for an uncertain future.
2. **Be aware of different approaches to STEAM education**, including varying levels of disciplinary integration and diverse pedagogical models that can be adapted to different classroom contexts.
3. **Understand and use STEAM as a framework for research and linking to real-life problems**, connecting classroom learning to authentic challenges that foster inquiry, curiosity, and meaningful engagement.
4. **Understand that STEAM as an educational approach can motivate students to want to learn and actively participate in lessons**, creating conditions where children become invested, curious, and persistent learners.
5. **Understand that STEAM activities can be used to develop skills**, particularly the ten SPIRIT transversal skills essential for children's growth and future adaptability.
6. **Understand that STEAM activities can be used to teach content**, recognizing that STEAM approaches efficiently integrate curricular objectives across multiple disciplines while maintaining academic rigor.
7. Understanding the STEAM template developed as a result of the project, you will be able to use it as a tool to develop your own STEAM program

These objectives guide the structure and content of this training module. As you progress through the material, you will encounter each of these dimensions, building a comprehensive understanding of why and how STEAM education serves as a powerful vehicle for preparing children to thrive in a complex, interconnected world.

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# Read before the workshop - STEAMified transversal skills development

## 1. Evolution of STEAM education

To cultivate the competencies central to the SPIRIT framework, it is essential to understand the foundation and evolution of STEAM education. STEM - Science, Technology, Engineering, and Mathematics - emerged as a formal educational framework in 2001, when the acronym was coined by leaders at the US National Science Foundation. However, discussions about strengthening these disciplines in education had begun years earlier, driven by concerns about student performance and future workforce readiness. The impetus for STEM education arose from international assessments such as TIMSS (Trends in International Mathematics and Science Study) and PISA (Programme for International Student Assessment), which revealed significant gaps in student achievement. These findings sparked urgent conversations about educational reform, not only to improve academic outcomes but also to address declining interest in STEM careers. Policymakers recognized that these trends posed risks to economic competitiveness and innovation capacity on both national and global scales. In response, nations worldwide began realigning their educational systems, emphasizing interdisciplinary approaches that connect classroom learning to authentic, real-world challenges.

Within the SPIRIT project, STEAM education serves as a powerful vehicle for developing the ten transversal skills essential for children's future well-being. What distinguishes STEAM from traditional subject-based instruction is its emphasis on integration and application. Rather than treating Science, Technology, Engineering, Arts, and Mathematics as isolated domains, STEAM weaves them together through hands-on, inquiry-based experiences that mirror the complexity of real-world problems. This approach naturally cultivates critical thinking, creativity, collaboration, and several other transversal skills that align directly with the SPIRIT framework's vision for preparing children to navigate an uncertain and rapidly changing future. In essence, STEAM education embodies a holistic approach to learning that extends beyond academic achievement. It equips children with both knowledge and competencies while fostering a mindset oriented toward innovation, empathy, and problem-solving. As outlined in the SPIRIT framework, this interdisciplinary methodology creates natural opportunities for children aged 6-10 to develop the transversal skills that will serve them throughout their lives. Through STEAM, learning becomes active, meaningful, and connected to the real world - preparing children not merely to succeed in school but to thrive as adaptable, resilient, and creative individuals in an interconnected global society with balance.

## 2. STEAM lesson approaches – Addressing versatility in approaches

Educators engaging with STEAM education quickly encounter a landscape marked by diversity and adaptability. This variety stems partly from the evolving nature of the field itself. The term has proven remarkably flexible, giving rise to variations such as STEAM (STEM + Arts), STREAM (STEM + Arts + Reading/Research), and even STEMM (STEM + Medicine).

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Beyond definitional variations, STEAM approaches differ in their degree of disciplinary integration. Four levels of integration are identified:

- Disciplinary (subjects taught separately),
- Multidisciplinary (subjects taught in parallel around a common theme),
- Interdisciplinary (subjects merged with blurred boundaries), and
- Transdisciplinary (subjects fully integrated around real-world problems).

These levels represent a continuum, offering educators flexibility in designing learning experiences that suit their students' developmental stages and curricular contexts.

Despite this diversity, a unifying principle underlies all effective STEAM education: the rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise."

Within the SPIRIT project, we embrace this diversity and adaptability while maintaining a clear focus on skill development. The STEAM programs provided by the consortium reflect this versatility - educators will encounter different approaches, each designed to foster transversal competencies while addressing varied learning objectives and classroom contexts. Some activities emphasize exploration and inquiry; others focus on design and prototyping. Some integrate all five STEAM disciplines; others highlight connections between two or three. Some of the programs among the tools that have been developed apply the STEAM approach to outdoor education and focus more on nature connection, valuing nature and people, hands-on activities, dirty learning, etc., in addition to the subject-related connection. This flexibility is intentional, allowing teachers to select approaches that align with their students' developmental levels, school's pedagogical vision, and the specific skills they wish to cultivate.

A noteworthy educational approach to STEAM Education is **the STEMOOVIE approach**, developed by educators in Belgium which exemplifies one particularly robust framework for structuring STEAM learning experiences . STEMOOVIE places dynamic research and design processes at its centre, recognizing that authentic learning [1] occurs through cycles of investigation, creation, testing, and refinement. The model comprises three interconnected components:

- **Learning by Research**[2] enables students to acquire insights and develop critical mindsets through systematic investigation. Students formulate questions, gather information,

[1] In the context of school learning, the term "authentic learning" refers to educational approaches aimed at connecting school learning to real-world problems and real-life applications (Great Schools Partnerships). Authentic learning contributes significantly to the development of knowledge that can be used to solve practical problems encountered in everyday life.

[2] This learning approach models the fundamental steps of scientific research. It differs from discovery learning in that it requires inductive and deductive reasoning as well as stronger teacher guidance. The learning process consists of several stages: precisely defining the problem, formulating hypotheses, collecting data, and attempting to solve the problem.

*Source (in both cases): Education 2030 Learning Sciences Research Group: FOCUSES OF LEARNING AND TEACHING – Perspectives on Modern Teaching and Learning*

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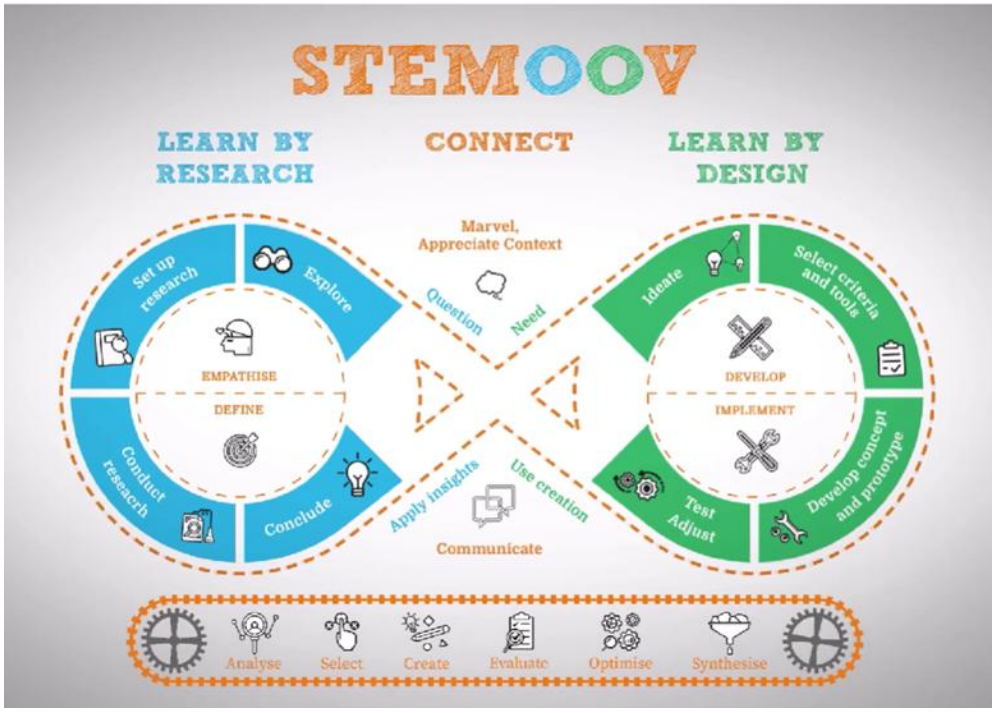
design experiments, make predictions, conduct observations, and draw evidence-based conclusions. Importantly, this process is iterative rather than linear – students may revisit earlier steps as new questions emerge. The partners place a high priority on research and the connection to real-world problems (authentic learning), **which is reflected in two key sections of each STEAM program description: "Real-world STEAM Connection and Problem Definition**" and "**Notes on Research-based Approach and Integration**"

- **Learning by Design**[3] empowers students to transform ideas into tangible prototypes. Beginning with brainstorming and ideation, students' progress through planning, creating, testing, and refining their solutions. This phase emphasizes creativity, problem-solving, and resilience as students encounter challenges and iterate toward improvement.
- **Connect** serves as both the engine and glue of the STEMOOVIE model. This dimension links students to their real-world environment, to each other through collaboration, and to the higher-order cognitive skills they develop during STEAM activities. Connection ensures that learning extends beyond the classroom, fostering relevance and meaningful engagement.




All STEAM approaches are used by SPIRIT partners resonate powerfully with Kolb's Learning Cycle, which the SPIRIT handbook identifies as essential for developing transversal skills. Kolb's cycle comprises four stages: Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. Each stage supports the development of behavioural competencies in young learners.

[3] Design-based learning is a student-centered pedagogical approach that employs creative problem-solving, empathy, and iterative hands-on work (often carried out by the student). The fundamental stages of this framework are empathy, defining the task (problem), creative ideation, prototyping, and testing.

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1. **Concrete Experience** corresponds with the initial engagement phase of STEAM activities. Students encounter hands-on challenges - planting seeds, building structures, investigating phenomena - that require them to exercise teamwork, empathy, problem-solving, and resilience. For example, when students work together to design an automatic plant watering system, they immediately experience the demands of collaboration and creative thinking.
2. **Reflective Observation** follows naturally as teachers guide students to discuss their experiences. Questions such as "How did you feel during the activity?" or "What strategies helped your team succeed?" encourage students to examine their emotional responses and interpersonal dynamics. In the STEMOOVIE model, this reflection occurs organically as students evaluate why their prototypes succeeded or failed, prompting them to consider alternative approaches.
3. **Abstract Conceptualization** involves connecting specific experiences to broader principles. Teachers help students recognize patterns and name the skills they are developing. For instance, after a design challenge, educators might introduce vocabulary related to problem-solving steps or teamwork strategies, creating a shared language that students can apply across contexts. This phase mirrors the moments in STEMOOVIE when students move from observing a specific outcome to understanding underlying principles, such as how moisture sensors function or why certain materials behave in particular ways.
4. **Active Experimentation** occurs when students apply their learning to new situations. In STEAM contexts, this manifests as iterative testing and refinement - students adjust their designs, try alternative materials, or tackle new challenges using strategies they have developed. This phase embodies the growth mindset central to the SPIRIT framework, encouraging students to view setbacks as opportunities for learning rather than failures.

By recognizing the alignment between the STEAM approach and Kolb's experiential learning framework, educators can appreciate how STEAM activities naturally support the development of transversal skills. The STEAM approach emphasizes active engagement, reflection, conceptual understanding, and iterative application - precisely the conditions under which children aged 6-10 develop lasting competencies and SPIRIT skillset but accompany students in training skills that will enable them to successfully face personal, professional, and social challenges, making a real difference in their growth.

## 3. Focusing on the SPIRIT STEAM core

While STEAM education encompasses diverse approaches and methodologies, the SPIRIT project identifies four core parameters that define high-quality STEAM learning experiences. These parameters ensure that activities not only engage students intellectually but also cultivate the transversal skills essential for future well-being. Every STEAM activity within the SPIRIT framework is designed around these interconnected dimensions:

1. **Connection to the Real World**: Authentic learning occurs when students perceive relevance beyond the classroom. STEAM activities grounded in real-world contexts - investigating local environmental issues, designing solutions to community challenges, or exploring phenomena students encounter in daily life - foster motivation and meaningful engagement. This connection also develops the SPIRIT skill of

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connectedness, helping children recognize their role within broader social and ecological systems.

2. **Connection to Research and Inquiry-Based Learning**: Curiosity drives deep learning. STEAM activities invite students to formulate questions, investigate phenomena, gather evidence, and draw conclusions. This inquiry stance nurtures critical thinking, flexibility, and the sense of wonder that fuels lifelong learning. Rather than passively receiving information, students actively construct understanding through exploration and discovery.
3. **Motivating Learners to Engage Actively**: Effective STEAM activities spark intrinsic motivation. Through hands-on challenges, creative problem-solving, and opportunities for collaboration, students become invested in their learning. Activities that offer choice, allow for multiple solution paths, and provide tangible outcomes naturally engage children's interest and encourage persistence. This active participation builds resilience and self-efficacy as students see themselves as capable problem-solvers and creators.
4. **Development of Transversal Skills - Particularly the 10 SPIRIT Skills**: While content knowledge matters, the primary purpose of SPIRIT STEAM activities is skill development. Every activity intentionally creates opportunities for students to practice and refine emotional regulation, creativity, problem-solving, critical thinking, resilience, flexibility, curiosity, empathy, valuing people and nature, and connectedness. These competencies emerge naturally through collaborative challenges, design iterations, reflective discussions, and the authentic application of knowledge to meaningful problems.

These four parameters form the SPIRIT STEAM Core - the foundation upon which all exemplary STEAM learning experiences rest. In the sections that follow, we will explore how this core translates into educational practice, examining both the skill development potential and the curricular integration possibilities that make STEAM such a powerful pedagogical approach within the SPIRIT framework.

## 4. Integrating transversal skills development

Transversal skills are the core of the SPIRIT project, and STEAM education is a uniquely rich medium for developing them through authentic, interdisciplinary challenges. These cognitive, social, and emotional capacities - often called soft, life, or 21st-century skills - help learners collaborate, adapt, and navigate complexity, remaining valuable long after specific content changes.

The SPIRIT framework identifies ten essential transversal skills for children aged 6-10, each crucial for future well-being in an uncertain world. STEAM education offers unique pathways for developing each of these competencies:

**Emotional Awareness, Regulation, and Communication**: STEAM activities create emotionally rich collaborative experiences where students encounter frustration when prototypes fail, excitement when solutions work and must communicate feelings constructively while navigating group dynamics and setbacks.

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**Creativity**: STEAM challenges require divergent thinking and novel problem-solving through open-ended design tasks that have multiple viable solutions, encouraging students to generate original ideas, combine concepts unexpectedly, and express thinking through diverse modalities including artistic, verbal, and kinesthetics forms.

**Problem-Solving**: The engineering design cycle at STEAM's core explicitly teaches systematic problem-solving as students define challenges, gather information, generate solutions, test ideas, analyse results, and refine approaches through iterative cycles.

**Critical Thinking**: STEAM's inquiry-based investigations cultivate analytical reasoning as students design fair tests, control variables, interpret data, evaluate evidence against criteria, distinguish reliable information from speculation, and form evidence-based conclusions.

**Resilience**: The iterative design process ensures students regularly encounter failure as structures collapse and predictions prove incorrect, reframing setbacks as essential learning opportunities while building tolerance for frustration and persistence through challenge.

**Flexibility**: STEAM's open-ended challenges demand adaptability as unexpected results require revised hypotheses, initial designs need pivoting to alternative solutions, and collaboration with peers necessitates remaining open to different perspectives and approaches.

**Curiosity, Sense of Wonder, and Openness**: STEAM activities begin with phenomena that genuinely spark interest - investigating why objects float, exploring how bridges hold weight, discovering how plants respond to environments - tapping into children's natural wonder while the Arts component reveals beauty in patterns and concepts, connecting intellectual understanding with aesthetic appreciation.

**Empathy**: Collaborative STEAM work requires attending to teammates' ideas and recognizing peers' emotions, while activities addressing real-world problems like designing assistive devices or investigating environmental impacts prompt students to consider diverse human needs and experiences.

**Valuing People and Nature**: STEAM investigations of ecosystems, environmental phenomena, and sustainability develop ecological awareness and appreciation for nature's complexity, while collaborative challenges teach students to recognize and celebrate diverse contributions as they experience how complementary talents strengthen collective work. Placing STEAM activities in an outdoor environment – "Dirty STEAM Learning" -, the direct integration of STEAM activities into nature, explicitly boosts the development of green and sustainability competences, the exploration of the relationship between nature and humans, and the awareness that all creatures of nature are interdependent and part of a single universe.

**Connectedness**: STEAM's interdisciplinary nature reveals how Science, Technology, Engineering, Arts, and Mathematics interweave in authentic contexts, while investigations of local environmental issues, global technologies, and cross-cultural innovations help students recognize relationships among people, communities (local, national and global), and natural systems rather than viewing knowledge or existence as isolated fragments.

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Understanding how STEAM activities naturally foster these competencies helps educators facilitate with intentionality. By recognizing moments when skills emerge - when a failed test offers a resilience-building opportunity, when diverse team ideas create space for empathy and flexibility, when surprising results spark curiosity - teachers can use strategic questions and reflective prompts to make skill development explicit, helping students recognize and name the competencies they're practicing so these skills transfer to new contexts beyond the STEAM activity itself.

## 5. Integrating content and curriculum

While skill development forms the primary focus of the SPIRIT project, educators understandably wonder how STEAM activities integrate with mandatory curricular content and learning objectives. A common concern is that STEAM approaches, however valuable for skill development, may divert precious instructional time from required academic material. However, this concern rests on a false dichotomy. High-quality STEAM education does not require choosing between skills and content; rather, it provides a powerful vehicle for achieving both simultaneously.

STEAM activities inherently address rigorous academic concepts across multiple disciplines. When students investigate plant growth, they engage deeply with life science curriculum standards related to organisms and environments. When designing bridges, they apply mathematical concepts.

A project investigating water quality might simultaneously engage students in scientific investigation skills, mathematical data collection and graphing, literacy research and writing, technological tool use, and artistic communication of findings. This integration allows teachers to address diverse curricular requirements efficiently while providing students with the holistic, contextualized learning that supports deep understanding and retention.

The versatility of STEAM approaches allows teachers to adapt the framework to their specific curricular needs, student interests, and available resources. A teacher focusing on geometry might engage students in designing architectural models. A teacher exploring cultural studies might facilitate students' creation of artistic and engineering artifacts reflecting different societies' innovations. The common thread is not specific content but rather the interdisciplinary, inquiry-based, design-oriented approach that characterizes STEAM learning.

Furthermore, STEAM education directly responds to the reality that our world operates interdisciplinarily. Professional scientists collaborate with engineers, artists, and mathematicians. Community challenges require integrated knowledge from multiple domains. Global issues like climate change, public health, and technological ethics demand citizens who think across disciplinary boundaries and recognize complex interconnections. By providing students with educational experiences that mirror this interdisciplinary reality, STEAM prepares them not merely for school success but for meaningful participation in contemporary society.

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For educators committed to the SPIRIT framework's vision of preparing children for an uncertain future, STEAM education offers a coherent pedagogical approach that honours both academic rigor and skill development. The activities provided by the SPIRIT consortium demonstrate this balance, each designed to engage students in substantive content learning while creating authentic opportunities to develop the ten SPIRIT skills. As teachers explore these activities, they will discover that investing time in STEAM approaches yields rich dividends: students who are not only knowledgeable but also curious, creative, resilient, empathetic, and equipped to navigate the complex challenges of the 21st century.

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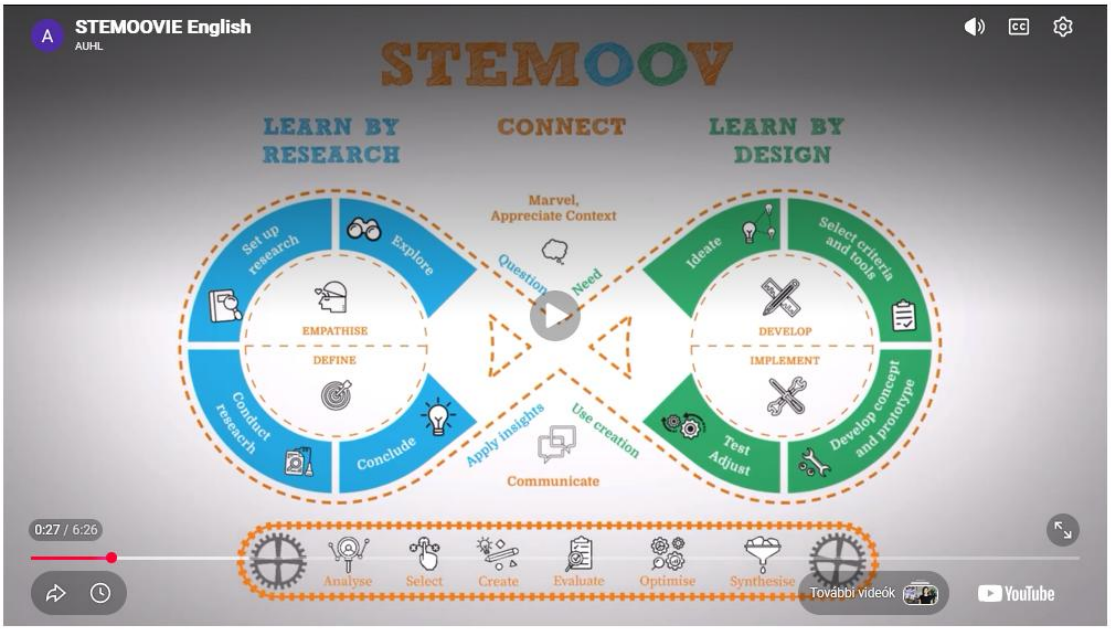
# Watch before the workshop - STEMOOVIE model

After reading the chapter **STEAMified transversal skills development**, please **watch the video presentation about STEMOOVIE model**. The model was developed by educators in Belgium which exemplifies one particularly robust framework for structuring STEAM learning experiences. STEMOOVIE places dynamic research and design processes at its centre, recognizing that authentic learning occurs through cycles of investigation, creation, testing, and refinement.


The video presentation is also available on the project's YouTube channel. The original language of the presentation is English, but by clicking the CC icon, you can set the subtitles to the languages of the project partners.

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# Activity 1 – Energiser: Using a Symbolic STEAM Demonstration to Build Real-World Connections

This activity contains different training elements: symbolic energiser, short demonstration, brainstorming, guided group exercise, gallery walk, and structured reflection on how a symbolic STEAM activity can be connected to real-life situations, curriculum content, research-based learning, and the development of the 10 SPIRIT Skills.

## Learning outcomes

Participants understand and begin to use STEAM as a framework for making meaningful connections between an activity, real-life situations or problems, curriculum content, research-based learning, and the intentional development of the 10 SPIRIT Skills.

## Activity/exercise in details

### General information, overview

This activity is designed as a symbolic energiser for the start of a new training day. It reconnects participants to what they explored before the workshop and immediately places them in an active, creative, and strategic way of thinking.

The main purpose is to help participants practise making STEAM connections. They begin with something that may seem simple or abstract and work towards connecting it to a **real-life situation, scenario, or problem**. In this activity, a real-world connection may be social, emotional, environmental, scientific, or linked to everyday life, as long as it moves the activity beyond the demonstration itself into something meaningful and relevant.

This is important because real-world connection is central to STEAM. If teachers can learn to make these connections intentionally, they can later make a wide range of classroom activities more relevant and relatable for their students.

The symbolic energiser itself is therefore less important than the thinking it prompts. The trainer/facilitator may choose any suitable symbolic energiser, though it is best if it comes from the STEAM templates already created by the consortium. Any examples from the templates may be used, such as:

- **How does precipitation sound? – Stage 1**
- **States of matter – Stage 3**
- **Emotion builders – Stage 5**

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After the demonstration, participants work in **3 groups**. They first generate possible real-world connections, then choose one, and finally analyse it through four simplified planning sections:

1. **Real-world STEAM Connection & Problem definition**
2. **The topic within the curriculum they can connect it to / National curriculum Link and Objectives**
3. **Notes on Research-based approach & integration**
4. **Primary SPIRIT Skill(s) that can be developed through this activity**

The aim is not to produce a complete STEAM lesson plan, but to help participants understand how an initial symbolic idea can be developed into a more intentional STEAM connection.

### Introduction: 0-10 minutes

As participants enter, the trainer/facilitator invites them to "put on their creative problem-solving hat" and observe the demonstration carefully.

The trainer briefly explains the task:

- they will first watch a short symbolic demonstration;
- then they will think about what it could represent;
- then they will connect it to a real-life situation, scenario, or problem.

The trainer should make clear that in STEAM, an activity becomes stronger when it is connected to something meaningful, relevant, or worth investigating.

The trainer then carries out the symbolic energiser demonstration. The recommended demonstration is the **Kinder Egg Explosion**, though another symbolic energiser from the consortium templates may also be used.

If the **Kinder Egg Explosion** is used, the trainer takes the yellow/orange plastic toy container from a Kinder Egg, removes the chocolate and toy, places baking soda in the larger half, adds a small amount of water to the smaller half without mixing them yet, closes the capsule firmly, shakes it, and places it on the floor. If the seal is tight and the quantities are correct, the capsule pops.

The demonstration should not last more than **3 minutes**.

Immediately afterwards, the trainer asks:

- What does this make you think of?
- What could this symbolise?
- What real-life situation, scenario, or problem could this connect to?

If participants begin generating ideas independently, the trainer moves straight into group brainstorming.

If participants seem unsure about the kind of connection expected, the trainer may give **one brief example only**. This should clarify the task without reducing participants' own creative thinking. For example, with the **Kinder Egg Explosion**, the trainer may say that one possible connection is how a person's inner world can be affected by outside actions or inputs, which may lead to emotional reactions. The trainer should not develop this example further at this stage.

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## Step by step details of the main part.

### Step 1: Brainstorm possible connections

Participants work in **3 groups** using whiteboards or poster paper. Each group brainstorms possible real-world connections based on the symbolic energiser. At this stage, the aim is to generate possibilities, not to go into depth.

**Trainer instruction:** Ask groups to write short ideas only. Groups have **3 minutes** to list their ideas.

### Step 2: Share initial ideas

Each group shares its ideas with the whole group. Each group has **2 minutes** to present.

**Trainer instruction:** Keep this part brief. Do not allow groups to go into full explanations yet. The purpose of this stage is to show that one symbolic starting point can lead to several meaningful directions.

### Step 3: Choose one connection

Groups return to their tables and choose **one** connection to develop further.

**Trainer instruction:** Tell participants to choose the idea with the strongest potential to become meaningful for teaching and learning.

### Step 4: Model the exercise structure

Before groups begin the main exercise, the trainer shows them how to use the four sections.

If the trainer is using the **Kinder Egg Explosion**, the detailed STEAM program is available as an attachment to this activity. If the trainer chooses another STEAM program from the **"COMPREHENSIVE STEAMIFIED TRANSVERSAL SKILLS DEVELOPMENT TOOLBOOK FOR TEACHERS",** participants should receive a hyperlink to the STEAM Activity for that activity.

Participants should also receive a **simplified exercise sheet** containing only the four planning sections:

1. **Real-world STEAM Connection & Problem definition**
2. **The topic within the curriculum that they can connect to / National curriculum Link and Objectives**
3. **Notes on Research-based approach & integration**
4. **Primary SPIRIT Skill(s) that can be developed through this activity**

The exercise sheet should include one **simplified example** based on the demonstrated activity.

The trainer briefly walks participants through this example and shows how one symbolic connection can be developed across the four sections.

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**Trainer instruction:** Say clearly that participants are not expected to create something as detailed as the full template. They are only expected to organise their thinking using the simplified exercise sheet. This modelling and clarification should take approximately **3–5 minutes**. If a different symbolic energiser is used, the trainer should provide the matching filled-in template and a corresponding simplified example on the exercise sheet.

### Step 5: Create the poster

Each group creates a poster using the four simplified sections. Groups have **5 minutes** to complete their posters.

**Trainer instruction:** Remind participants to keep their ideas short, clear, and structured under the four headings.

### Step 6: Gallery Walks

Groups place their posters on the wall or in another visible place in the room. Participants move around, read the posters, and look at how the other groups developed their connections.

This Gallery walk lasts **3–5 minutes**.

**Trainer instruction:** Ask participants to pay attention to similarities and differences between the groups' connections.

### Step 7: Whole-group reflection

The trainer closes the activity with a whole-group reflection of **10–15 minutes**.

The reflection should bring participants back to the learning objective. The trainer should help them identify how they moved:

- from observation;
- to symbolic interpretation;
- to a real-world connection;
- to a more structured STEAM analysis.

The trainer should also help participants reflect on why this matters for teaching: if they can learn to make these connections intentionally, they can later design or adapt activities that feel more meaningful and relevant to their students.

**Trainer instruction:** Keep the reflection focused on process and application, not on judging whether one connection was "right."

## Suggested themes and guiding questions

#### Questions immediately after the demonstration

- What does this make you think of?
- What could this symbolise?
- What real-life situation, scenario, or problem could this connect to?

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**Questions for brainstorming**

- What possible real-world connections can you make with what you observed?
- How could this become meaningful for children?
- How might this connect to something beyond the classroom?

**Questions for selecting one connection**

- Which connection has the strongest potential for deeper learning?
- Which one could become meaningful in a classroom context?
- Which one could lead clearly into curriculum content or skill development?

**Questions for working through the four sections**

- How could this connection be framed as a real-world situation or problem?
- What curriculum topic could connect to it?
- How could inquiry, exploration, or testing be built into it?
- Which SPIRIT Skill or skills could it help develop?

**Questions for the final reflection**

- How did your thinking change from the first observation to the finished poster?
- What helped you move from an abstract idea to a more intentional STEAM connection?
- How could this process help make classroom learning more relevant for students?
- How does this activity help you begin using STEAM as a framework for intentional connection-making?

## Timing

- **Introduction and demonstration:** no more than 3 minutes
- **Initial group brainstorming:** 3 minutes
- **Group sharing of ideas:** 6 minutes
- **Example and explanation of the four sections:** 3–5 minutes
- **Working through the four sections**: 15-20 minutes
- **Poster creation:** 5 minutes
- **Gallery walks:** 3–5 minutes
- **Whole-group reflection:** 10–15 minutes

In total – approximately (depending on the group size) 40–50 minutes

## Materials

Post-its, flip-charts and blue stick, stationery (including colour markers), coloured cards, small whiteboards or poster paper, printed or digital exercise sheets with the four simplified planning sections, hyperlink to the filled-in STEAM Activity template for the demonstrated activity, printed or digital simplified example based on that template, and the materials needed for the chosen symbolic energiser demonstration.

The detailed list of the materials needed for implementing the chosen STEAM activity is available in the Toolbook.

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## Pay attention – Important note

Keep the focus on the thinking process, not on the demonstration itself. The purpose is to help participants practise moving from observation to interpretation to meaningful STEAM connection.

If participants struggle to understand the task, give **one brief example only** to clarify the kind of connection expected. More than one example risks narrowing participants' thinking too early.

The full description of the chosen STEAM activities should be shared as added value and future reference, while the actual task during the session should be completed through the simplified exercise sheet.

If a different symbolic energiser is used, make sure that the template link and simplified example match that activity. Where possible, it is best to choose the energiser from the consortium's existing STEAM templates.

## Handouts

For Activity 1, a handout is required. It is called **Simplified Exercise Sheet**, and it can be found in the appendix of this material and downloadable from the SPIRIT portal.

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# Activity 2 – Empirical Workshops: Station Rotation

The elements of the Activity 2 are as follows: station rotation with experiential simulation, group reflection, and structured whole-group sharing on how STEAM activities can motivate students, develop skills, and teach curriculum content.

## Learning outcomes

Participants will understand that STEAM as an educational approach can motivate students to want to learn and actively participate in lessons; that STEAM activities can be used to develop skills; and STEAM activities can be used to teach content.

## Activity/exercise in details

This activity is organised as a **2-hour empirical workshop** using **3 stations** and **3 groups**. Each station has **2 corners**: an **experimental corner** and a **thinking corner**. Participants move through the stations as learners, experiencing the activities from the perspective of their students.

The aim is to help participants understand, through direct experience, that STEAM can motivate learners, develop skills, and teach content. Instead of discussing STEAM only in theory, participants first experience a short part of a STEAM activity and then analyse what that experience could mean educationally.

The station activities must therefore be suitable for **self-led group work**. They should be clear, manageable, and safe enough to be carried out with minimal trainer intervention.

At each station, participants follow the same sequence:

1. experience one selected stage or a limited part of a STEAM activity in the **experimental corner**;
2. move to the **thinking corner**;
3. complete the exercise sheet by answering the same four questions;
4. tidy the station for the next group.

Each station should be supported by a **simplified station scenario** and a **short activity description** prepared by the trainer/facilitator. These should match only the exact part of the activity used in the station.

The four recurring questions are:

1. How can this STEAM activity/approach motivate students to want to learn and actively participate in lessons?
2. How can it develop skills?
3. What syllabus/curriculum-based topic or content could you connect this activity to?
4. How could this activity be used in your classroom?

Participants should receive these four questions **before** the station rotation begins so they can keep them in mind while doing the activities.

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Each group spends **40 minutes** at each station. The first **25–30 minutes maximum** are for the activity and tidying up. The remaining **10–15 minutes maximum** is for discussion and completion of the exercise sheet.

When the bell rings, groups rotate as follows:

- Group 1 moves from Station 1 to Station 2 to Station 3
- Group 2 moves from Station 2 to Station 3 to Station 1
- Group 3 moves from Station 3 to Station 1 to Station 2

After all three groups have completed all three stations, the class returns for a **station-by-station whole-group review**. For each station, all three groups briefly present how they answered the exercise sheet. Only after these presentations do participants review the **full filled-in STEAM template** for that activity, so they can compare their own thinking with the original educational design and context. This review process is repeated for all three stations.

The repetition is intentional. By working through three substantially different STEAM activities, participants gradually strengthen their ability to identify motivation, skill development, curriculum links, and classroom application. The intended progression is:

- introduction and openness
- strengthen and reinforce
- solidify and grow

## Step by step details of the workshop activities

### Introduction

The trainer introduces the three learning objectives and explains that participants will work in **3 groups** and rotate through **3 stations**.

The trainer explains that each station includes:

- an **experimental corner**, where participants carry out a short practical STEAM simulation;
- a **thinking corner**, where they reflect together and complete the exercise sheet.

The trainer should make clear that participants are expected to **lead themselves** through the station work as a group. The trainer manages the overall process, timing, and support when needed, but does not lead each activity step by step.

The trainer then gives participants the four recurring questions and explains that the same questions will be used at all three stations. The trainer also explains the station flow:

- experience the activity;
- discuss and complete the exercise sheet;
- tidy the station;
- rotate when the bell rings.

The rotation procedure should be stated. The trainer should also explain that participants will **not** use the full original STEAM templates during the station rotation. Instead, each station will provide a simplified scenario and short activity description. The full templates will be introduced

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later, after all three groups have gone through all three stations and the whole-group review begins.

### Step 1: Begin at assigned stations

Participants begin in **3 groups** at their assigned stations. Each station should already be prepared with:

- the materials for the activity,
- the simplified station scenario,
- the short activity description,
- the exercise sheet,
- and enough space for both the experimental and thinking corners.

**Trainer instruction:** Before starting the timer, check that each group knows where to begin.

### Step 2: Station work

1. **Experience the activity**

Participants complete the practical part of the station in the **experimental corner**. They work only with **one selected stage** or a limited part of the original STEAM activity. The aim is not to complete the full lesson, but to experience a meaningful slice of it.

The first **25–30 minutes maximum** are used for:

- carrying out the activity,
- discussing initial impressions within the group,
- and tidying the materials.

**Trainer instruction:** Let participants work things out together as much as possible.

2. **Complete the exercise sheet**

Participants then move to the **thinking corner**. There, they discuss the activity more intentionally and complete the exercise sheet using the four recurring questions. The remaining 10-15 minutes of the 40 minutes allocated to the first round should be used for the following tasks:

- group discussion,
- agreeing on key points,
- and completing the exercise sheet.

**Trainer instruction:** Ask groups to focus on their clearest and most relevant ideas.

### Step 3 – 4: Station Rotations

When the bell rings, groups stop, tidy the station, and move immediately to the next one. This continues until all groups have completed all three stations.

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### Step 5: Whole-group review, one station at a time

After all three rotations are complete, the trainer brings the whole group back together. The trainer reviews the stations **one at a time**. For the first station under review, each of the **3 groups** presents how they answered the exercise sheet for that station. Each group has a maximum of **5 minutes**, including any brief questions or comments from the other groups.

**Trainer instruction:** Keep the sharing focused on the four questions.

### Step 6: Review the full original template

Only **after** all three groups have presented for that station are participants given **5 minutes** to skim read or review the **full detailed STEAM** program for that activity.

This allows them to compare:

- the short station experience,
- their own analysis,
- and the original, fully developed educational design.

The same review sequence is then repeated for the second station and then for the third station.

### Step 7: Close the activity

To close, the trainer briefly highlights that participants have now worked through three different STEAM experiences and, through repetition, have strengthened their ability to identify:

- how activities can motivate learners,
- how they can develop skills,
- how they can connect to content,
- and how they can be adapted for classroom use.

The trainer may also point participants back to the Padlet and the wider SPIRIT Community of Practice so that ideas can continue to be shared beyond the session.

## Suggested themes and guiding questions

The four recurring questions remain central throughout the activity.

**Questions used at every station**

- How can this STEAM activity or approach motivate students to want to learn and actively participate in lessons?
- How can it develop skills?
- What syllabus or curriculum-based topic or content could this activity connect to?
- How could this activity be used in your classroom?

**Questions to support the station-by-station review**

- What was motivating about this activity from the learner's perspective?
- What kinds of skills could this activity help develop?
- What content or curriculum topic could it support?
- How did the short simulation compare with the full original STEAM template?
- What did this activity show about one possible way of designing a STEAM lesson?

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- How did your thinking become clearer from the first station to the third?
- What ideas are you now starting to have for your own classroom?

## Time allocation

- **Introduction to the station system, learning objectives, and recurring questions: brief trainer introduction before rotation**: 5 minutes
- **Station rotation 1:** 40 minutes
- **Station rotation 2:** 40 minutes
- **Station rotation 3:** 40 minutes
- **Whole-group review, one station at a time:** 15 minutes
- **Review the full original template:** 15 minutes
- **Close the activity:** 10 minutes

Total: maximum 150 minutes

## Required materials

Three station setups, each with:

- one **experimental corner**
- one **thinking corner**

Exercise sheets with the four recurring questions, clear station instructions, timer or bell for rotation, stationery, printed or digital access to the full filled-in STEAM templates for each activity, and all materials needed to carry out the three selected STEAM simulations or experiments.

## Pay attention – Important note

The success of this activity depends heavily on the trainer's choice of the three station activities. The three activities must be **substantially different** from one another. They should differ in:

- motivational effect,
- research approach,
- STEAM integration approach,
- and topic.

One useful way to select the three activities is to consider the **different levels of integration in STEAM education**. The trainer may choose activities that reflect increasing levels of integration, such as:

- disciplinary
- multidisciplinary
- interdisciplinary
- transdisciplinary

This helps participants see that STEAM can be structured in different ways and that not all STEAM activities integrate subjects to the same degree.

It is strongly recommended that the station activities be practical and experiential rather than based only on reading lesson plans. Participants should first experience a brief stand-alone part

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of an activity, reflect on it through the four questions, and only afterwards compare their ideas with the full original template.

Due to time limitations, participants should work only with **one selected stage** or a limited part of each full STEAM activity.

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# Appendix: Suggested options for the three stations

**Station 1 – Symbolic / exploratory or artistic / creative STEAM activity.**

Choose **one** of the following routes:

**Option A: Symbolic / exploratory route.**

Choose **one** of the following:

- How does precipitation sound? – Stage 1
- States of matter – Stage 3
- Emotion builders – Stage 5

**Option B: Artistic / creative route.**

Choose one of the following:

- Painting and creative work in school
- Paper making

If the facilitator chooses the artistic/creative route, participants should still work only with a **short stage** or a limited part of the activity.

**Station 2 – Assisted assembly/construction challenge.**

Choose one of the following:

- Da Vinci Bridge
- Marshmallow Pyramid
- Painting and creative work in school

**Station 3 – Investigation and testing activity**

**Operation Bubbles:** Participants use an already prepared bubble solution, assemble the wands, and test the bubbles to explore how to make the biggest bubbles and what affects them, such as wind, speed, direction, wand size, and similar variables.

**These three suggested station types provide useful variation:**

- Station 1 may begin with either symbolic / exploratory thinking or a more artistic / creative approach,
- Station 2 focuses on building and assisted assembly,
- Station 3 focuses on testing, observation, and variable exploration.

For each station, the trainer/facilitator should prepare a **simplified station scenario** and a **short activity description** limited to the exact scope of the station task.

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The full original STEAM templates should **not** be used as instruction documents during the station rotation. They are introduced later, when each station is analysed one at a time with the whole group.

One of the stations may be the same activity that was used in the earlier demonstration, as this can save time and build on participants' familiarity with it.

Finally, the trainer should acknowledge that there are different valid ways of designing a STEAM lesson, including different levels of disciplinary integration. The purpose of the three rotations is not to show one single correct model, but to help participants recognise patterns, differences, and possibilities they can later adapt for their own students and context.

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# Activity 3 – Plenary Reflection Discussion: From Initial Attitude to Motivation to Use STEAM

This closing activity is a whole-group reflection and guided discussion on participants' own shift in motivation to use STEAM activities in ways that match their needs and their students' needs, while encouraging continued connection through support systems and the wider Community of Practice.

## Learning outcomes

Participants reflect on how their own motivation to use STEAM has changed during the training and identify next steps for using STEAM activities intentionally in ways that respond to their own teaching context and their students' needs.

## Activity/exercise in details

This activity serves as a reflective closing after Activity 2. It gives participants space to think about where they started and where they are now in relation to their own motivation to use STEAM activities in the classroom.

The purpose of the activity is to help participants recognise their own shift in mindset, confidence, openness, and readiness to use STEAM more intentionally and strategically. It also gives them space to speak about the potential they now see in STEAM, to share ideas, and to think about how they can continue supporting one another after the training.

This whole-group reflection also acts as a transition from the shared experience of the workshop toward longer-term collaboration. Participants are encouraged to think about creating their own support systems and to connect with the wider SPIRIT Project Community of Practice, both locally and internationally.

The trainer should pay special attention during the closing session to ensuring that all participants have an equal opportunity to express their thoughts and, consequently, to give everyone approximately the same amount of time to speak, without favouritism. Do not skimp on spending time on this task. Do not underestimate the importance of this activity; reinforcement (both self-affirmation and affirmation from colleagues) is crucial to the learning process and to fostering motivation to apply what has been learned.

**The main reflective question at the heart of the activity is:** How has your motivation changed from where you were at the beginning to where you are now in relation to using STEAM activities that match your needs and your students' needs in your classroom?

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### Introduction

The trainer introduces the activity as a reflective closing discussion following the station rotation. The trainer explains that participants have now experienced several STEAM activities, thought about their motivational value, their skill-development potential, and their curriculum relevance, and that this is now the moment to reflect together on what has shifted in them personally.

The trainer should frame the activity positively and openly. Participants should feel that they are not being evaluated but invited to notice their own development and put it into words within the whole group.

**After the introduction and sharing their inspiring thoughts, the trainer introduces the central reflection question.**

### Plenary reflection discussion

The trainer invites the whole group into a guided discussion focused on their journey through the training. Participants reflect together on where they started, what they experienced during the training, and what has shifted in their motivation to use STEAM.

The trainer facilitates the discussion by helping participants compare:

Participants should be encouraged to speak as concretely as possible and to refer to specific moments, activities, or realisations that influenced their thinking.

As the discussion develops, the trainer can invite participants to share:

- what possibilities they now see for STEAM in their own classroom;
- what kind of STEAM activities they feel more ready to use;
- what kind of support they may still need;
- and what ideas they already have for adapting STEAM to their own students and context.

In the final part of the discussion, the trainer encourages participants to think beyond the training itself. Participants should be invited to consider how they can remain connected, create their own support systems, and engage with the wider SPIRIT Project Community of Practice at both local and international level.

## Time allocation

- **Introduction to the reflection:** 5 minutes
- **Whole-group discussion:** 20 minutes
- **Closing and invitation to continue through support systems / Community of Practice:** 5 minutes

In total – 30 minutes

## Required materials

Reflection question displayed on screen or flipchart, or whiteboard for noting key words or themes, stationery if participants are invited to jot down personal notes.

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## Handouts

No handouts needed

## Pay attention – Important note

This activity should feel reflective, encouraging, and forward-looking. The trainer should create an open and affirming tone so that participants feel comfortable speaking honestly about their starting point and any shift that has taken place.

The focus should remain on participants' own motivation and readiness to use STEAM in ways that are relevant to their teaching reality and to their students' needs. The trainer should also help participants leave the session with a sense of possibility, connection, and continued support through their own support systems and the wider Community of Practice.

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# Read after the workshop – How to Approach SPIRIT'S STEAM Activity Examples

## Introduction to SPIRIT STEAM Activities

After the workshop, the next step is to continue building on what you have experienced, discussed, and reflected on. At this stage, the goal is to deepen your understanding by looking more closely at the SPIRIT STEAM activity examples provided by the consortium and by considering how these can inform your own teaching practice.

Begin by exploring and studying the SPIRIT STEAM activity templates. As you do so, look carefully at how each activity connects to the **SPIRIT STEAM Core**: connection to the real world, connection to research and inquiry-based learning, motivation for active student engagement, and development of transversal skills. Notice how different activities highlight different SPIRIT skills, use different STEAM approaches, and connect to different kinds of curriculum content.

Pay particular attention to activities that relate to your own teaching context, especially those that connect with curriculum content you are likely to teach. As you read, think about how an activity might need to be adapted for your students' developmental level, your classroom setting, the materials available to you, and the skills you want to prioritise. This process is intended to help you move from understanding STEAM as a concept to recognising how it can be used intentionally and realistically in your own classroom.

Once you become more familiar with the structure and educational logic of the provided examples, you can begin to design your own STEAM experiences in ways that match your teaching needs and your students' needs. One possible support for this process is the thoughtful use of AI tools to help generate starting ideas. For example, you may choose to create prompts that include:

1. the curriculum content you need to teach;
2. the SPIRIT skill or skills you want to prioritise;
3. one completed SPIRIT STEAM activity template as a model;
4. and any important contextual details, such as limited materials, combined lessons, particular student needs, or a preferred STEAM approach.

Used carefully, this can help generate ideas while still keeping your planning grounded in the SPIRIT framework and in sound pedagogical thinking.

You can also continue expanding your ideas by exploring other sources of inspiration, such as teacher blogs, professional communities, social media groups, or curated idea banks. When doing this, search intentionally using keywords that reflect both your content goals and your skill-development focus, such as *STEAM teamwork challenge* or *creative maths problem-solving*. Any activity you find should always be adapted to your students, your aims, and your context rather than copied directly.

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Whenever possible, test activities yourself before using them with students. This helps you identify possible challenges, refine your facilitation, and make adjustments before classroom use. As you continue experimenting, you are encouraged to share your own adaptations and reflections with colleagues and with the wider SPIRIT Community of Practice. In this way, the learning continues beyond the workshop and becomes part of an ongoing culture of professional exchange, reflection, and improvement.

## Navigating the SPIRIT STEAM Template Structure

As you continue exploring the SPIRIT STEAM activity examples, it is important to understand the role of the template structure itself. The SPIRIT STEAM activity templates are intentionally detailed because they are designed as a learning tool within this training. Their purpose is to make the pedagogical thinking behind a STEAM activity visible.

The templates help you see clearly how a STEAM activity can be designed in a way that intentionally supports skill development, engagement, inquiry, and meaningful curriculum integration. At the same time, it is important to understand that this detailed format is **not** intended to become a permanent requirement for your everyday lesson planning. The purpose of the structure is to help you internalise the principles behind strong STEAM design so that, over time, you can apply them more naturally and flexibly in your own practice.

## Template overview

Each template typically includes:

- **Basic information**: age group, duration, stages, and subject connections
- **STEAM event summary**: primary SPIRIT skills, curriculum objectives, and the real-world problem definition
- **Materials at a glance**: a complete list of materials needed
- **Lesson flow overview**: a stage-by-stage outline with durations and targeted skills
- **Stage details**, including:
  - how particular SPIRIT skills are developed,
  - concrete skill development goals,
  - curriculum links,
  - materials and preparation notes,
  - guided questions,
  - debriefing questions,
  - and tips for managing challenges

One particularly important element is the **Real-world problem definition**, as well as the **Notes on Research-based approach and integration** which should be expressed from the students' perspective. This helps ensure that the activity is framed in a way that feels meaningful and engaging to learners.

Another key feature is the use of **guided (supportive and reflective) questions** throughout the stages. These questions do much more than check understanding. They help make learning visible, prompt reflection, support skill development, and encourage students to articulate their thinking, strategies, emotions, and choices.

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## The philosophy behind the structure

This level of detail is intended to reveal the professional thinking that turns an ordinary task into a strong STEAM learning experience. By studying the templates, you begin to see more clearly:

- why certain questions are asked,
- where particular skills are likely to emerge,
- how inquiry is structured,
- how engagement is sustained,
- and how one stage leads meaningfully into the next.

In other words, the template helps make explicit the logic of the **SPIRIT STEAM Core**:

- the connection to a real-world context,
- the role of research and inquiry,
- the importance of active learner motivation,
- and the intentional development of SPIRIT skills.

The more you study this structure, the more you develop the professional judgment to design or adapt activities with greater confidence.

## Using the templates flexibly

These templates should be approached as **learning resources**, not rigid scripts. As you study more examples, you will begin to notice recurring patterns in strong STEAM design: meaningful problems, guided inquiry, opportunities for creativity, testing and iteration, reflection, and intentional skill development.

Once you understand these patterns, you can adapt activities more freely. You may choose to:

- adjust the real-world connection so it feels more relevant locally;
- simplify or deepen the inquiry depending on students' age and experience;
- emphasise different SPIRIT skills depending on your goals;
- extend some stages and shorten others;
- or adapt the activity to fit time, materials, and curriculum needs.

The aim is not to reproduce the template exactly every time, but to understand what makes the activity educationally strong.

## Moving forward

After this training, you are not expected to create long and elaborate templates for every STEAM activity you use. Instead, the goal is for you to plan with greater intentionality.

As your confidence grows, the key questions become:

- Does this activity connect to something meaningful for my students?
- Does it involve genuine inquiry or exploration?
- Will it motivate active participation?
- What content does it help me teach?
- Which SPIRIT skills can develop through it, and how can I support that intentionally?

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The detailed templates are therefore best understood as scaffolding for your professional learning. They help you sharpen your pedagogical eye, strengthen your planning decisions, and become more confident in creating STEAM experiences that are relevant, engaging, and responsive to your own classroom reality.

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# Self-exercise after the Workshop

## Continue exploring the SPIRIT STEAM activities by accessing the PDF handbook of all STEAM activities developed within the project.

This handbook is provided as a practical resource to support you after the training. It allows you to revisit the activities introduced during the workshop, explore additional examples, and identify ideas that may be relevant to your own classroom context.

As you go through the handbook, focus on activities that connect with:

- the curriculum content you teach,
- the developmental level of your students,
- the SPIRIT skills you would like to strengthen,
- and the kinds of learning experiences you would like to create in your classroom.

You are encouraged to use the handbook not only as a source of ready-made ideas, but also as inspiration for adapting, combining, and reshaping activities in ways that respond to your own teaching needs and your students' needs.

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# Simplified Exercise Sheet

**Blank group sheet**

Choose one connection from your group brainstorming. Then use the 4 sections below to deepen that connection and turn it into a more intentional STEAM idea.

**Our chosen symbolic energiser / connection:**

| | |
|---|---|
| **1. Real-world STEAM Connection & Problem definition** | Write one real-life connection, situation, scenario, or problem that your group wants to focus on. |
| **2. National curriculum Link and Objectives** | What topic, unit, or curriculum objective could this connect to? |
| **3. Notes on Research-based approach & integration** | How could inquiry, exploration, testing, or research be built into this idea? |
| **4. Primary SPIRIT Skill(s) that can be developed through this activity** | Which SPIRIT Skill(s) could be developed through this activity? |

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## Worked example: Kinder Egg Explosion

This page shows one simplified example of how the 4 sections can be filled in. Use it as a model only.

### Demonstration used in this example

**Kinder Egg Explosion:** a small plastic capsule is prepared with baking soda and water and then pops when pressure builds. In the training, the demonstration is used symbolically to help participants think beyond the experiment itself and begin making real-world STEAM connections.

### Simplified example based on one possible connection

| | |
|---|---|
| **1. Real-world STEAM Connection & Problem definition** | Possible symbolic connection: our inner world can be affected by outside actions or inputs. Just as the capsule reacts when what is outside meets what is inside, people can react emotionally to what happens around them.<br>Problem idea: How can we use a safe “pop” experiment to help children think about how actions, words, or situations can affect feelings and reactions? |
| **2. National curriculum Link and Objectives** | Possible connection: Health and well-being / emotions / cause and effect.<br>Example objectives:<br>- recognise simple cause-and-effect relationships;<br>- discuss how outside actions can influence feelings;<br>- build vocabulary linked to emotions, reactions, and safe choices. |
| **3. Notes on Research-based approach & integration** | Children can observe, predict, test, and reflect. A teacher could ask them what they think will happen, let them observe the reaction, and then guide them to connect this to emotional or social situations. The inquiry is simple, concrete, and suitable for discussion. |
| **4. Primary SPIRIT Skill(s) that can be developed through this activity** | Emotional awareness, regulation and communication; empathy; curiosity / sense of wonder / openness.<br>Possible secondary skill: problem-solving. |

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