

## Didactic Scenario

### 1. Title

Numbers and Creation. Mathematics through Art

### 2. Keywords

Math, Creation, Numbers, Art, Creative Expression, Combining Math and Art, Colors, Patterns, Artistic Expression, Crafts, Skill Development

### 3. Basic information

**STEAM Subject:** MATHEMATICS

**Typical interaction time with the instructional scenario in teaching hours for in-school work:**  
90 minutes

**General description of the script:**

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Introduction to Mathematics through Art	Preparatory Stage	30 minutes
Creating Works of Art with Numbers	Implementation Stage	45 minutes
Presentation and Discussion	Evaluation Stage	15 minutes

**Age group:** 8-12 years old

**Estimated difficulty level:**

Very Easy	Easy	Moderate	Challenging	Very Challenging
	X			

## Teaching resources

### Materials:

- Paper: Cardboard or plain paper in various colors.
- Markers: Colored markers or water markers for drawing.
- Paints: Paints (acrylics, temperas) and brushes for artistic work.
- Glue: Glue for gluing various elements.
- Scissors: Scissors for cutting paper.
- Decorative Materials: Rhinestones, stickers, and other decorations for the enriched creation.
- Statistics or Tables: If required, tables or data sheets with numbers for inspiration.
- Artwork Images and Example: Artwork images incorporating mathematical elements for guidance.

**School infrastructure:** No special school infrastructure is required other than basic classroom equipment.

### Additional material from external sources/online tools:

- GeoGebra (<https://www.geogebra.org/>)  
Free math software that provides tools for geometry, algebra, and calculus. Ideal for creating and analyzing geometric shapes.
- Math Playground (<https://www.mathplayground.com/>)  
Online platform that offers fun math games and activities, including geometric activities.
- Canva (<https://www.canva.com/>): Drawing tool that can be used to create digital artwork that incorporates mathematical concepts.
- Maths and Art (booklet) ([http://1lyk-p-falir.att.sch.gr/newsite/images/1ogelpfal/projects/Projects\\_2015-2016/Project-Mathimatika-kai-texni-2016.pdf](http://1lyk-p-falir.att.sch.gr/newsite/images/1ogelpfal/projects/Projects_2015-2016/Project-Mathimatika-kai-texni-2016.pdf))
- Bonus scenario from the Aesop platform entitled "Mathematics through Art".  
<https://aesop.iep.edu.gr/node/17869>

### Differentiated instruction for students with different abilities and learning styles in the same class:

- Custom Activities: Create activities with different levels of difficulty. For example, more advanced students can experiment with more complex numbers and patterns, while beginners can focus on basic numbers and simple designs.

- **Material Options:** Offer a variety of materials and tools for creating artwork. Some students may prefer markers, while others may prefer paints or digital tools.
- **Teamwork:** Create groups of students with different abilities to work together. The most capable students can mentor others, while everyone has the opportunity to participate and learn from each other.
- **Individual Support:** Provide personalized guidance and support to students who need more help. This may include extra time or materials to complete their activities.

**Developed by:** Development Center of Thessaly

#### 4. Educational Problem

The scenario "Numbers and Creation: Mathematics through Art" solves the problem of students' lack of interest and understanding of mathematical concepts. Many students find it difficult to connect with mathematics when it is only taught in theory. This scenario incorporates art, allowing students to explore and express mathematical concepts through the creation of artwork. Practical application of numbers and mathematical concepts combined with creativity helps them better understand concepts, develop an interest in mathematics and improve problem-solving and critical thinking skills. It also promotes cooperation and teamwork, addressing students' social and communication skills.

#### 5. Learning Objective (-s)

1. **Understanding Mathematical Concepts.** Students will understand basic mathematical concepts such as numbers, patterns and relationships, and be able to apply them to artistic projects.
2. **Creative Expression.** They will develop their creative skills through the artistic process, using numbers and mathematical elements to create works of art.
3. **Collaboration Enhancement.** Through group activities, students will learn to collaborate, share ideas, and support each other in the artistic and mathematical process.
4. **Improving Critical Thinking.** Students will strengthen their critical thinking skills by analyzing their projects and discussing the mathematical concepts involved.
5. **Developing Problem Solving Skills.** They will learn to face challenges and find solutions through the creative process, enhancing their ability to solve problems.

6. Awareness of the Relationship between Mathematics and Art. They will understand the connection between mathematics and art, recognizing how mathematical concepts can be integrated into creative processes.

## 6. Phases of the Scenario

### Phase 1

**Title:** Introduction to Mathematics through Art

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 30 minutes

**Detailed description of the scenario phase:** In Phase 1 of the scenario, "Introduction to Math through Art," students are introduced to basic math concepts in a fun and interactive way. The teacher begins with a presentation that combines numbers and artistic elements, explaining how numbers and patterns can be expressed through art. Students explore examples of artwork that incorporate mathematical elements, such as abstract patterns and geometric forms. This phase includes discussions that encourage active participation and understanding of the connection between mathematics and art, preparing students for the next creative activities in the script.

#### Activity Sheets:

Activity Sheet - Phase 1: Introduction to Mathematics through Art

Purpose: To understand the connection between mathematics and art.

Activity 1: Identifying Mathematical Concepts

Directions: Observe the following geometric shapes and mathematical patterns. Note the shapes you can see:

Cycle  
Square  
Triangle  
Numbers (eg 1, 2, 3)

Activity 2: Idea Generation

Directions: Think about how you can use numbers or geometric shapes to create a work of art. Write or draw your idea below:

Subject: \_\_\_\_\_  
Figures and figures I will use: \_\_\_\_\_

### Activity 3: Class Discussion

Directions: During the discussion, answer the following questions:

How do you think numbers and shapes can be combined in art?  
Which piece of art you saw impressed you the most and why?

### Phase 2

**Title:** Creating Works of Art with Numbers

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 45 minutes

**Detailed description of the scenario phase:** In Phase 2 of the scenario, "Creating Artwork with Numbers," students apply their knowledge of numbers and patterns by creating their own artwork. With the help of materials such as cardboard, markers and paints, students draw and represent numbers and geometric shapes combined with artistic techniques. As they create, they are encouraged to experiment with different colors and patterns, developing their creativity and ability to combine math with art. This process helps them deepen their understanding of math concepts, making learning fun and experiential.

**Activity Sheets:** N/A

### Phase 3

**Title:** Presentation and Discussion

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 15 minutes

**Detailed description of the scenario phase:** In the 3rd phase of the scenario, "Presentation and Discussion," students have the opportunity to present the artwork they created, focusing on the connection of numbers and mathematics to art. Each student or group explains the process of creating their work, mentioning the numbers and patterns they used and their meaning. An open discussion follows, where students give feedback to each other, recognizing the creative elements and mathematical concepts that were incorporated into the projects. The teacher guides the discussion, highlighting learning points and encouraging students to think about how art can express mathematical concepts, thus promoting critical thinking and self-esteem.

**Activity Sheets:** N/A

## 7. Evaluation Methodology

- **Creative Presentations:**

In phase 3, evaluate student presentations based on criteria such as clarity, creativity, and ability to explain the connection between math and art. Use a simple score column for evaluation.

- **Self-Assessment Sheet:**

Give students a self-assessment sheet where they can judge their own participation and creation. Questions might include: "How have I used numbers in my art?" or "What would I like to improve in the next activity?"

## 8. Additional Resources for the teacher

N/A