

## Didactic Scenario

### 1. Title

Discovering Geometric Shapes through Creative Construction

### 2. Keywords

Geometric shapes, Creative construction, Math games, Paper constructions  
Shapes and models, Geometry exploration, Mathematical thinking, Crafts and math, Math  
creativity

### 3. Basic information

**STEAM Subject:** MATHEMATICS

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

**General description of the script:**

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Introduction to Paper Geometry	Preparatory Stage	40 minutes
Creating Geometric Shapes	Implementation Stage	40 minutes
Presentation and Discussion	Evaluation Stage	40 minutes

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

**Estimated difficulty level:**

Very easy	Easy	Moderate	Challenging	Very Challenging
		X		

## **Teaching resources**

### **Materials:**

- Paper: Paper of different colors and types (white, colored, cardboard).
- Scissors: For cutting the shapes.
- Glue: Skenite or liquid glue for gluing the shapes.
- Pencils/Markers: For drawing and marking shapes.
- Rulers: For measuring and aligning shapes.
- Soap or Red Details: For marking borders and corners (optional).
- Reference Examples: Images or templates of geometric shapes for guidance.
- Folders or Small Boxes: To store students' work.

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

### **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.

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

- Provide personalized guidance and support if necessary. You can create step-by-step plans for students who need more guidance and simpler instructions for others.
- Offer activities with different levels of difficulty. For example, you can create activities for beginners, intermediate, and advanced students so that everyone can participate according to their level.
- Create teams with different skill levels to collaborate and support. More skilled students can help their classmates, while weaker students can work on simpler activities or with extra help.

**Developed by:** Development Center of Thessaly

#### 4. Educational Problem

This scenario, titled "Creating Geometric Shapes with Paper," solves the problem of elementary school students understanding and applying geometric concepts. Specifically, it helps students understand basic geometric shapes and their relationships through hands-on construction and creative activity.

Many students find it difficult to grasp abstract geometric concepts only through theoretical lessons. The script uses everyday materials and creative activities to make geometric concepts more tangible and understandable. In doing so, it enhances student engagement, improves the applicability of concepts, and develops critical thinking and problem-solving skills through the creative process.

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

1. Understanding Geometric Concepts: Students will understand basic geometric concepts, such as geometric shapes, sides, angles, and their relationships.
2. Developing Creative Skills: They will develop their creative skills through the construction of geometric shapes with everyday materials, promoting the practical application of geometric concepts.
3. Enhancing Cooperation and Teamwork: Through group activities, students will learn to collaborate effectively, share ideas and solve problems together.
4. Improving Critical Thinking: Their ability to think critically and solve problems will be enhanced as they evaluate and modify their constructions based on geometric principles.
5. Developing Problem Solving Skills: Students will learn to face challenges and find solutions through the creative process, enhancing their ability to solve problems.
6. Enhancing Craft Skills: They will improve their craft skills as they handle various materials to create geometric shapes.

#### 6. Phases of the Scenario

##### Phase 1

**Title:** Introduction to Geometry

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 40 minutes

**Detailed description of the scenario phase:** In Phase 1 of the scenario, students are introduced to basic geometry concepts through an interactive presentation and game. The teacher demonstrates geometric shapes such as squares, triangles and circles using simple examples and everyday objects. Students then engage in activities that involve identifying and distinguishing these shapes around them, enhancing their understanding of basic geometric concepts. This part prepares students for the next phases of the scenario, highlighting the importance of geometric shapes in everyday life and encouraging their participation in an experiential way.

#### Activity Sheets:

Activity Sheet: Introduction to Geometry

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

#### Activity 1: Pattern Recognition

Directions: Look at the geometric shapes below and use the markers to circle them in the drawing below.

Cycle  
Triangle  
Square  
Rectangle

Plan:

Draw or copy a design with different geometric shapes. Shapes can be of different sizes and colors.

#### Activity 2: Making Diagrams

Instructions: Use the following materials to make the geometric shapes:

Cardboard  
Shears  
Glue  
Markers

#### Work:

Cut and create a circle, a triangle, a square and a rectangle from cardboard.  
Draw or color the shapes as you like.  
Tape them in place on the classroom board or on a large sheet of paper.

#### Notes:

Evaluate your constructions and compare them to the real geometric shapes you were taught.

### Phase 2

**Title:** Schema Creation and Analysis

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 40 minutes

**Detailed description of the scenario phase:** In the second phase of the scenario, students are asked to apply their knowledge of geometric shapes through creative activities. Using cardboard, markers, and other materials, students create various geometric shapes, such as circles, triangles, squares, and rectangles, in order to understand the concept of shapes through their construction. They then analyze the shapes they created, recording features such as angles, sides and proportions. This process allows them to see the application of geometric concepts in practical examples and strengthen their spatial awareness, while encouraging them to collaborate and discuss their findings with their classmates.

**Activity Sheets:** N/A

### Phase 3

**Title:** Presentation and Discussion

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 40 minutes

**Detailed description of the scenario phase:** In the third phase of the scenario, "Present and Discuss", students present the geometric shapes they created and analyzed in the previous phase. Each student or group presents their work to the class, explaining the geometric features of their shapes, such as angles, sides and proportions. The presentation is accompanied by a short discussion where the students analyze their findings, compare the different designs and exchange views on their classmates' constructions. The teacher guides the discussion, highlighting important learning points and encouraging students to connect geometric concepts with practical examples. This process helps strengthen understanding of geometric concepts and develop presentation and critical thinking skills.

#### Activity Sheets:

##### Activity Sheet - Phase 3: Presentation and Discussion

Purpose: Assess understanding of geometric shapes through multiple choice questions.

Question 1: How many sides does a triangle have?

- A) 2
- B) 3
- C) 4
- D) 5

Question 2: Which of the following figures has all right angles?

- A) Square
- B) Triangle
- C) Rhombus
- D) Parallelogram

Question 3: Which of the following figures has only one straight side?

- A) Square
- B) Triangle
- C) Spiral
- D) Circle

## 7. Evaluation Methodology

A combined assessment methodology can be used to assess the understanding of geometric shapes. The teacher can assess the students through observation during the creation and analysis of the shapes, providing feedback on their accuracy and creativity. He can then use an activity sheet with multiple choice questions to assess theoretical understanding of geometric

concepts. Finally, class discussion, where students explain and present their shapes, provides additional evidence for their understanding and ability to apply geometric concepts.

#### 8. Additional resources for the teacher

N/A