

Didactic Scenario

1. Title

Symmetrical Art and Escher

2. Keywords

Interdisciplinary, Maths, Arts, tessellation, Zeugma Mosaic Museum, Gaziantep, Contemporary Art Museum - Arter (<https://www.arter.org.tr/>)

3. Basic Information

STEAM Subject: Maths, Arts, ICT, Mosaics

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

Maths (1 hour), IT (1 hour), Art (1 hour), Mosaics (40 min)

General description of the scenario:

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Warm-up activity, introduction to the topic	preparation stage	10'
Explanation of work ahead and what is expected of them	preparation stage	10'
Presentation of the instructional-educational content	implementation stage	40'

Age group: 11-15 years

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
			X	

Teaching resources

Material: colored paper, colored pencils, eraser

School infrastructure: Internet access, video projector or projection screen, tablets or smartphones

Additional material from external sources/online tools:

How to make rotational tessellations

<https://youtu.be/FB7AU3d2zUA>

How to make a tessellation

<https://youtu.be/5FIOF8xsPas>

How to make a tessellation

<https://youtu.be/yzmk0fa8uOU>

Zeugma Mosaic Museum

<http://zeugma.org.tr/sanaltur.aspx>

MC Escher, Images of Mathematics

<https://youtu.be/t-Gcz9FIB4w>

Escher works

<https://youtu.be/uOrMnL8I1hU>

M.C. Escher: A collection of 222 works

<https://youtu.be/5c33l8D0Bg4>

M.C. ESCHER DOCUMENTARY

<https://youtu.be/G4VAXILTRGS>

Differentiated Instruction for students of differing abilities and learning styles in the same class: N/A

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4. Educational Problem

In this learning scenario, students will work on mathematical and arts concepts such as rotation, translation or symmetries via this learning scenario where they will learn about tessellation and the work of M. C. Escher. As the final product of the Learning Scenario, students will create their tessellation after they have done some search on the net using Art Nouveau resources from Europeana. Additionally, students will do an online visit to Arter (<https://www.arter.org.tr/>). Then students can create a VR Museum, using Co Spaces where they can upload their scanned tessellation works. They will exhibit their works by creating a virtual exhibition-museum with the artsteps program.

5. Learning Objective (-s)

1. Maths course. Symmetry in Transformation Geometry (7.3.4. In reflection, the figure and the image correspond to each other. The distances of the incoming points to the line of symmetry are equal and discovers that his image is identical).
2. This course fits into Turkey Arts Curriculum
3. Study the concepts of symmetry, rotation and translation applying modular design compositions.
4. Distinguish between translation, symmetry, and rotation in the plane and create shapes using these movements.
5. Recognizes the existence of geometric transformations in nature and art.
6. Describe the basic elements of motions in the plane: symmetry axis, centers of rotation, rotation amplitude etc.
7. Build your own structures by manipulating objects and creating motions using technological tools when necessary.

6. Phases of the Scenario

Phase 1

Title: Warm-up activity, introduction to the topic

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 5'

Detailed description of the scenario phase:

The Mathematics teacher explains to the classroom what the project is about, its outcomes and how it will be evaluated. The teacher introduces movements in the plane (translation, rotation and symmetries), its key elements and definitions.

Activity sheets:

Escher works

<https://youtu.be/uOrMnL8l1hU>

M.C. Escher: A collection of 222 works

<https://youtu.be/5c33l8D0Bg4>

M.C. Escher Documentary

<https://youtu.be/g4VAxilTRGs>

Phase 2		
Title: Explanation of work ahead and what is expected from them		
Indoor	Outdoor	Mixed
X		
Phase duration in minutes: 5'		
Detailed description of the scenario phase: The Mathematics teacher explains to the classroom what the project is about, its outcomes and how it will be evaluated. The teacher introduces movements in the plane (translation, rotation and symmetries), its key elements and definitions.		
Activity sheets: MC Escher, Images of Mathematics https://youtu.be/t-Gcz9FIB4w		
Phase 3		
Title: Presentation of the instructional-educational content		
Indoor	Outdoor	Mixed
X		
Phase duration in minutes: 40'		
Detailed description of the scenario phase: The Art teacher explains how to create a translational and rotational tessellation with videos, explaining the work of M. C. Escher. Students visit the https://www.kulturportali.gov.tr/turkiye/gaziantep/gezilecekyer/zeugma-mozaiik-muzesi and select an artwork they use for creating their tessellation.		
Activity sheets: Handouts the teacher has already prepared for the students or alternatively the teacher can take the class to the ICT room and students can select their picture from any portal or prepare their owns. Students can also use mosaic samples in this museum. http://zeugma.org.tr/sanaltur.aspx		

7. Evaluation Methodology

By means of this lesson students will learn about mathematical concepts such as translation and rotation by means of an interdisciplinary activity where they will be introduced to tessellations and the work of M. C. Escher and produce their own rotational or translational tessellation.

Student Feedback

	% final mark	10	8	5	3
Art teacher observation	20%	All group members have actively worked and helped each other	Almost all group members have actively worked and helped each other	Half group members have actively worked and helped each other	There is a clear lack of collaboration among group members
Math teacher observation	20%	All group members have actively worked and helped each other	Almost all group members have actively worked and helped each other	Half group members have actively worked and helped each other	There is a clear lack of collaboration among group members
Deliverables	60%	All tessellation posters (one per group member) have been delivered. Optional: the group has created their part of the virtual exhibition	More than half tessellation posters have been delivered. Optional: The group has created their part of the exhibition	Less than half tessellation posters have been delivered.	No poster has been delivered

Symmetry In Which Field Of Your Life We Come To The Most?



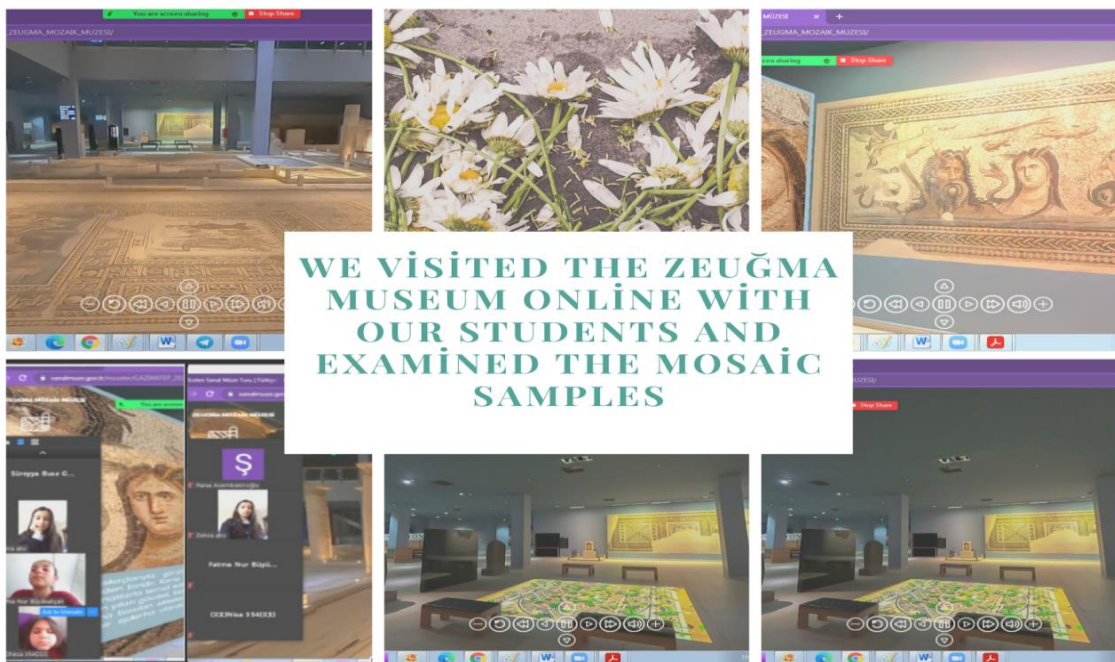
<https://www.menti.com/pi6xyrmckk>

Which stage did you find difficult while working your course?

<https://answergarden.ch/1448399>



8. Additional Resources for the teacher



https://www.canva.com/design/DAF0KMUSY7M/riRGxXPBQSBuG0JQ1DVTQ/view?utm_content=DAF0KMUSY7M&utm_campaign=designshare&utm_medium=link&utm_source=editor