

# Europeana Learning Scenario

(Teachers)

## Title

Create mosaic or calculate area

## Author(s)

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## Abstract

Students can look at photographs of mosaics on <https://www.europeana.eu/en> . They will recognize geometric shapes, the teacher leads them to notice squares and rectangles. They can draw a square and a rectangle in the digital mosaic application. First, they count how many smaller squares they need to fill in the shapes, and then they can figure out how to calculate that number. The teacher can also show a video lesson explaining the calculation of the area of the square and rectangle. The teacher checks the students' knowledge with worksheets.

In the creative part of the lesson, students are divided into smaller groups. At Europeana they can choose a mosaic with mostly geometric shapes that they will partially reconstruct. They make a similar mosaic using paper squares with an area of square centimeter. Then they organize a class exhibition and fill out assessment rubrics.

At the end of the lesson, students can take a photo of each other and then use a digital app that will turn their photo into a mosaic.

## Keywords

mathematics, area, square, art, mosaic

## Table of summary

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<b>Subject</b>	Mathematics - square area, rectangle area Art - making mosaics
<b>Topic</b>	Area of squares and rectangles Making mosaic
<b>Age of students</b>	10 to 11 years old
<b>Preparation time</b>	30 minutes



Teaching time	90 minutes
Online teaching material	<a href="https://www.europeana.eu/en">https://www.europeana.eu/en</a> <a href="https://www.theedkins.co.uk/jo/mosaic/index.htm">https://www.theedkins.co.uk/jo/mosaic/index.htm</a> <a href="https://www.youtube.com/watch?v=...">How to Calculate Area of Square, Rectangle, Triangle? - YouTube</a> <a href="http://www.go4mosaic.com/en/create.html">http://www.go4mosaic.com/en/create.html</a>
Offline teaching material	colored paper, glue, scissors
Europeana resources used	<a href="https://www.europeana.eu/en/item/92040/URN_RS_NAE_cad914bf_f2b3_40ee_bf56_f0e5ee64ebabcho">https://www.europeana.eu/en/item/92040/URN_RS_NAE_cad914bf_f2b3_40ee_bf56_f0e5ee64ebabcho</a> <a href="https://www.europeana.eu/en/galleries/mosaics">https://www.europeana.eu/en/galleries/mosaics</a> <a href="https://www.europeana.eu/en/search?page=1&amp;query=geometric%20mosaics&amp;reusability=restricted&amp;view=grid">https://www.europeana.eu/en/search?page=1&amp;query=geometric%20mosaics&amp;reusability=restricted&amp;view=grid</a>

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### Integration into the curriculum

Croatian Maths curriculum (5<sup>th</sup> grade):

“Student calculates and applies perimeter and area of geometric shapes.”

“Describes and calculates the area of squares and rectangles.”

“Discovers and explains the formula for calculating the area.”

“Solve tasks with content associated with the student’s environment and encourage them to create drawings composed of geometric characters and calculate their ranges and areas.”

Croatian Art curriculum (5<sup>th</sup> grade):

“The student compares works of art by connecting them with knowledge acquired in other subjects and experiences from everyday life.”

“The student demonstrates fine motor skills using I by varying the different art materials and procedures in own art expression.”

“The student describes and compares his visual or visual work and works of others the student points you out on interesting solutions or possible improvements.”

### Aim of the lesson

Students will learn how to calculate the area of squares and rectangles.

Students will reconstruct the seen mosaic.

### Outcome of the lesson

Students will solve a worksheet with tasks to calculate the area of squares and rectangles.  
 Students will make a mosaic out of paper as a reconstruction of the seen mosaic and assess the work with an evaluation table.

### Trends

STEM Learning: Increased focus on Science, Technology, Engineering, Mathematics subjects in the curriculum  
 Collaborative Learning: a strong focus on group work.  
 Visual Search & Learning: images and multimedia are more powerful than verbal stimuli.  
 BYOD: Students bring their own mobile devices to the classroom.

### Key competences

Mathematical competence: participants will develop and apply knowledge of measures and structures, basic operations and basic mathematical presentations, an understanding of mathematical terms and concepts, and an awareness of the questions to which mathematics can offer answers.  
 Digital competence: participants will develop skills of using, accessing, filtering, evaluating digital content.  
 Personal, social and learning to learn competence: they should be able to communicate constructively, collaborate in teams and critically reflect about their work.  
 Cultural awareness and expression competence: Participants will develop skills that include the ability to express and interpret figurative and abstract ideas through art, making mosaics.

### Activities

Name of activity	Procedure	Time
<b>Introduction</b>	<p>The teacher can show to the students how people have decorated rich houses or villas. He can use photos of ruins of a villa from Greece that has no preserved walls, only floors.  <a href="https://www.europeana.eu/en/item/92040/URN_RS_NAE_cad914bf_f2b3_40ee_bf56_f0e5ee64ebabcho">https://www.europeana.eu/en/item/92040/URN_RS_NAE_cad914bf_f2b3_40ee_bf56_f0e5ee64ebabcho</a></p> <p>Students will surely notice the mosaics on the floor. The teacher talks to the students about the geometric shapes they can recognize.            They can look at a few more mosaics in which they can see various geometric shapes.  <a href="https://www.europeana.eu/en/galleries/mosaics">https://www.europeana.eu/en/galleries/mosaics</a></p>	5 minutes

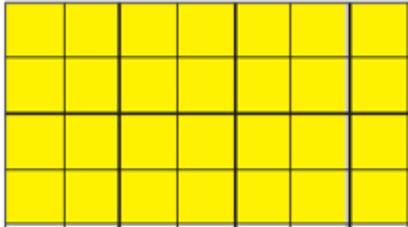
<b>Investigation and conclusion</b>	<p>Teacher and students can make mosaics of the simplest shape, square and rectangular. For that, they can use an application that allows filling in the squares in the grid.</p> <p><a href="https://www.theedkins.co.uk/jo/mosaic/index.htm">https://www.theedkins.co.uk/jo/mosaic/index.htm</a>.</p> <p>Students can count how many smaller squares they need to fill in the shapes, and then they can figure out how to calculate that number.</p> <p>The teacher can also show a video lesson explaining the calculation of the area of the square and rectangle.</p> <p><a href="https://www.youtube.com/watch?v=mAXzPYS6sCg">https://www.youtube.com/watch?v=mAXzPYS6sCg</a></p> <p>Students can now conclude that it is necessary to multiply the lengths of the sides of a square or rectangle to calculate the number of squares needed to pave them.</p>	15 minutes
<b>Knowledge assessment</b>	<p>The teacher prepares a worksheet and paper squares whose area is a square centimeter. (Worksheet is in Annex.)</p> <p>Students are solving the worksheet on their own. During that time, teacher is checking if they have mastered the material and is helping if necessary. Based on their answers, the teacher can see if the students have understood how to calculate the area.</p>	15 minutes
<b>Search and Art work</b>	<p>Students are divided into smaller groups and they search for mosaics with mostly geometric shapes on the page:</p> <p><a href="https://www.europeana.eu/en/search?page=2&amp;view=grid&amp;query=geometric%20mosaic">https://www.europeana.eu/en/search?page=2&amp;view=grid&amp;query=geometric%20mosaic</a>.</p> <p>They should choose one mosaic and try to reconstruct it using paper squares area square centimeter. They need colored papers, scissors and glue.</p>	40 minutes
<b>Self-assessment and peer assessment</b>	<p>Students can make a mosaic exhibition.</p> <p>Students evaluate their own cooperation during the work and the product of the work of other groups using the grading table. (Grading table in the Annex.)</p>	10 minutes
<b>Fun closing activity</b>	<p>At the end of the class, students can take photos of themselves with their mobile phones and turn their photo into a mosaic using digital tool:</p> <p><a href="http://www.go4mosaic.com/en/create.html">http://www.go4mosaic.com/en/create.html</a></p>	5 minutes

## Assessment

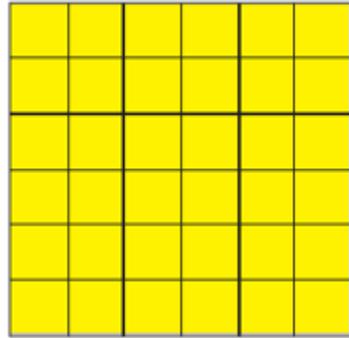
The teacher will assess the student's knowledge using a worksheet (in Annex).

**Find the area:**

a) by gluing paper squares



Area = 28 cm<sup>2</sup>

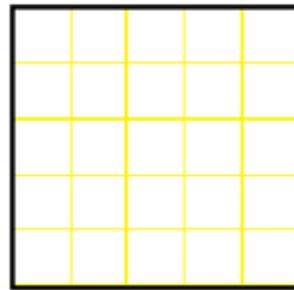


Area = 36 cm<sup>2</sup>

b) by drawing a squares

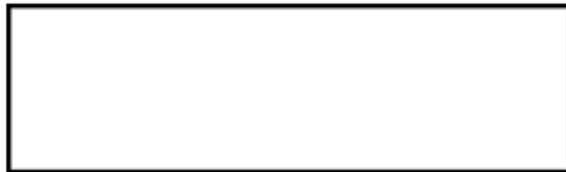


Area = 10 cm<sup>2</sup>



Area = 25 cm<sup>2</sup>

c) by measuring lengths



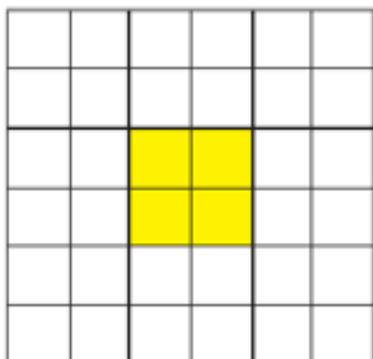
Area = 10 cm x 3 cm = 30 cm<sup>2</sup>



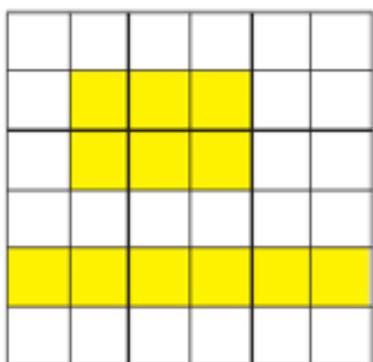
Area = 3 cm x 3 cm = 9 cm<sup>2</sup>

**Draw in grid:**

- a square of area 4 square centimeters.



- a rectangle of area 6 square centimeters.



**Draw:**

- a square of area 16 square centimeters.



- a rectangle of area 12 square centimeters.



Students evaluate their own cooperation during the work and the product of the work of other groups using the grading table:

CATEGORY	Improvement necessary	Some level of mastery	High level of mastery	Excellent level of mastery
<b>filled in by group members</b> Cooperation in our group	All or most of the work was done by one or two students.	Most of the students in the group participated in the work.	All students in the group participated, but not in all phases of the work.	All students of the group participated in all phases of the work.
<b>filled in by members of other groups</b> Mosaic reconstruction	The mosaic made by the students does not look like the selected photo of the mosaic.	The mosaic made has elements that resemble the mosaic from the photo, but is not completely accurate.	The mosaic mostly looks like a selected photo, but some parts could have been better made.	The mosaic that the students reconstructed is easily recognizable.
<b>filled in by members of other groups</b> Neatness of the mosaic	The squares are of the wrong dimensions, it is messily glued to the picture.	The squares are of the wrong dimensions, but it is neatly glued to the picture.	The squares are of good dimensions, but it is messily glued to the picture.	The squares are of good dimensions and neatly glued to the picture.

\*\*\*\*\* AFTER IMPLEMENTATION \*\*\*\*\*

### Student feedback

Add here the method with which your students will be able to give you feedback and discuss the lesson.

### Teacher's remarks

Add here your comments and evaluation **AFTER** the implementation of this lesson. You can always use a rubric for self-assessment.

### About the Europeana DSI-4 project

[Europeana](#) is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.

[European Schoolnet](#) (EUN) is the network of 32 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.

Annex

**Find the area:**

a) by gluing paper squares

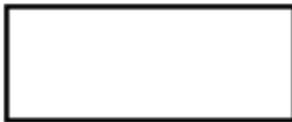


Area = \_\_\_\_\_



Area = \_\_\_\_\_

b) by drawing a squares

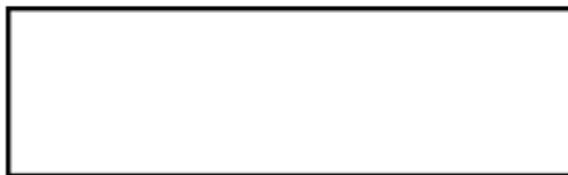


Area = \_\_\_\_\_



Area = \_\_\_\_\_

c) by measuring lengths



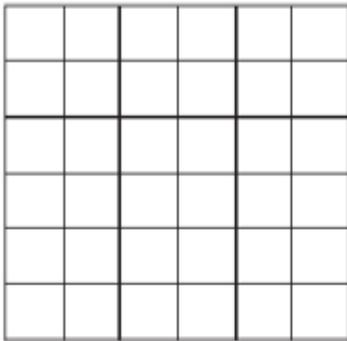
Area = \_\_\_\_\_



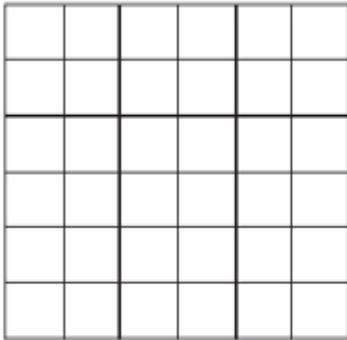
Area = \_\_\_\_\_

**Draw in grid:**

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**Draw:**

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	CATEGORY	Improvement necessary	Some level of mastery	High level of mastery	Excellent level of mastery
<b>filled in by group members</b>	<b>Cooperation in our group</b>	All or most of the work was done by one or two students.	Most of the students in the group participated in the work.	All students in the group participated, but not in all phases of the work.	All students of the group participated in all phases of the work.
<b>filled in by members of other groups</b>	<b>Mosaic reconstruction</b>	The mosaic made by the students does not look like the selected photo of the mosaic.	The mosaic made has elements that resemble the mosaic from the photo, but is not completely accurate.	The mosaic mostly looks like a selected photo, but some parts could have been better made.	The mosaic that the students reconstructed is easily recognizable.
<b>filled in by members of other groups</b>	<b>Neatness of the mosaic</b>	The squares are of the wrong dimensions, it is messily glued to the picture.	The squares are of the wrong dimensions, but it is neatly glued to the picture.	The squares are of good dimensions, but it is messily glued to the picture.	The squares are of good dimensions and neatly glued to the picture.