

Europeana Learning Scenario

Circles in the UNESCO cultural heritage of Croatia

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Abstract

Mathematics is all around us. We find it in geography, science, technology and art. It is the science of ideas and ideals.

This learning scenario will explore the mathematics present in the UNESCO cultural heritage in Croatia as a part of geographical features. Students will be invited to learn more about the irrational number of Pi (with story and video) and to get acquainted with the UNESCO protected cultural heritage of Croatia, focusing on Sinjska alka and rosettes. This will lead to a better understanding of the symmetries, parts of a circle and also geographical characteristics of Croatia.

Technology and gamification are present to arouse interest, increase participation, develop creativity and independence.

Keywords

UNESCO cultural heritage, circles, rosettes, Sinjska alka, rosettes

Table of summary

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Subject	Mathematics, Geography, History, Art, ICT
Topic	Circles around us
Age of students	13-15
Preparation time	2 hours
Teaching time	180 min
Online teaching material	Discover inspiring European cultural heritage Europeana https://youtu.be/h8895VO6oPE https://www.autodraw.com/ https://petalicapaint.pixiv.dev/index_en.html https://www.geogebra.org/classic?lang=enq
Offline teaching material	Paper; pencil; crayons; ruler; schoolbook; tablet; interactive whiteboard
Europeana resources used	List here links all of the Europeana resources used for this learning scenario. https://www.europeana.eu/en/item/2048053/MUO_027123 https://www.europeana.eu/en/item/2048053/MUO_027201

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Integration into the curriculum

Math - Models surfaces and ranges of geometric shapes (circle and its parts, circular section, polygons) problem solving, study of symmetry.

Science (Geography/History)- learning about Croatian intangible cultural heritage

Art- creating and designing, using visual elements

Aim of the lesson

The aim of this lesson is to promote mathematics from a cultural-historical point of view. A relationship is established between different mathematical and non-mathematical subjects.

Math - learn the parts of a circle (radius, diameter, circular section, circular section, circular crown), observe axis symmetry and central asymmetry

Science (Geography/History)- learn what belongs to Croatia's intangible cultural protection under the protection of UNESCO

Art- They will be able to create / design an alka, rosette with different lines, shapes and colors

Outcome of the lesson

Students will read, write, research, discuss ideas and results, play and explore solutions using digital technology. Students will discuss different points of view during their presentations.

Math - Apply axial and central symmetry. Assess the relationships between sizes within a character. Recognize characters that are axisymmetric and centrally symmetrical. Draw a circle and a circle precisely. Define a circle and a circle and describe their elements. Describe and draw parts of a circle.

Science (Geography/History)- Students will know the importance of cultural heritage.

Art- They will be able to create / design a rosette and alka of different lines, shapes and colors.

Trends

List the relevant trends that the lesson incorporates: <http://www.allourideas.org/trendiez/results>

Collaborative Learning-A strong focus on a group work

Peer Learning-students learn from peers and give one another feedback

Project Based Learning-students get focus based on tasks, they work in groups

Search & Learning-Visual images and multimedia are more powerful than verbal stimuli

STEM Learning -Increased focus on Science, Technology, Engineering, Mathematics subjects in the curriculum

21st century skills

Add here how the learning scenario corresponds to 21st century skills. To find out more: <http://www.p21.org/our-work/p21-framework>.

Communication, Creativity, Collaboration, Critical Thinking, Digital Literacy

Activities

Name of activity	Procedure	Time
1. Introductory motivation	a) Show the pictures to the students https://www.europeana.eu/en/item/2048053/MUO_027123 https://www.europeana.eu/en/item/2048053/MUO_027201 b) Explain to the students how they can search European themselves. - After the introductory part, students in group of 4 must find more information about Sinjska alka - Students place the found data on the Padlet	20'
2. Discussion	a) After placing the data on the Padlet, we conduct a discussion about what information the students found	10'
3. Presentation	a) We show the students a video https://youtu.be/h8895VO6oPE. b) We talk about what we have learned. We conclude that the Sinjska alka belongs to the UNESCO cultural heritage, and that the alka itself has the shape of a circle.	15'
4. Alka and circle	a) Once students find a picture of the alka, their task is to draw it in https://www.autodraw.com/. b) Students must photograph their drawing and save it on a tablet.	45'

Name of activity	Procedure	Time
	They open the saved image at https://petalicapaint.pixiv.dev/index_en.html and color it. c) After finishing the picture, they save the finished drawing on their tablets and put it on the plate with their name. d) By studying the pictures of the students we notice different parts of the circle. We introduce students to the parts of the circle (radius, diameter, circular section, circular section, circular cornice)	
5. Circles and UNESCO cultural heritage	a) The whole class - we look at pictures of Croatian heritage under the protection of UNESCO b) The whole class - talk about in which pictures they see the circles or parts of the circle and write down where we see them c) Working in pairs - each pair of students looks for rosette images on UNESCO cultural heritage images d) Working in pairs - students find the image and place it on the Padlet	20'
6. Rosettes on the churches	a) Students choose one of the rosettes b) Make a rosette model using geometric accessories or https://www.geogebra.org/classic?lang=eng c) Show whether the rosette is axisymmetrical or centrally symmetrical d) Using some of the tools (Canva, PosterMyWall, Book Creator, AdobeSpark ...) present your solution	70'

Assessment

Making a rosette-presentation of the work

***** AFTER IMPLEMENTATION *****

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 34 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.