

Europeana Learning Scenario

Title

Symmetrical ART

Author(s)

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Abstract

In this learning scenario, students will be working with mathematical and arts education concepts such as rotation, translation or symmetries by means of an activity where they will be introduced to tessellation and the work of M. C. Escher. As the final product of the Learning Scenario, students will be creating a tessellation using Art Nouveau resources from Europeana. Additionally, students can create a VR Museum, using CoSpaces where they can upload their scanned tessellation next to the original Europeana resource.

Keywords

Interdisciplinary, Maths, Arts, 14-17, tessellation, Art Nouveau

Table of summary

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Subject	Maths, Arts
Topic	Tessellation, Art Nouveau
Age of students	14-15
Preparation time	1 session
Teaching time	4 sessions + 2 optional sessions + 1 session for evaluation
Online teaching material	How to make rotational tessellations - https://youtu.be/FB7AU3d2zUA How to make a tessellation - https://youtu.be/5FIOF8xsPas CoSpaces - https://edu.cospaces.io/ Escher relativity - https://youtu.be/JdgPvripL9A Escher works - https://youtu.be/uOrMnL8l1hU
Offline teaching material	Handouts of Art Nouveau drawings from Europeana (alternatively the teacher can take the class to the ICT room and students can select their picture directly from Europeana), white paper, glue, scissors, tape
Europeana resources used	Art Nouveau Drawings - https://pro.europeana.eu/data/art-nouveau-drawings-of-plants-and-ornaments



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Integration into the curriculum

This lesson fits into the Spanish Curriculum of Arts (Plastic Visual and Audiovisual Subject) in 3º ESO:

- Study the concepts of symmetries, rotations and translations applying the designing of modular compositions.

This lesson fits into the Spanish Curriculum of Mathematics Applied to Academic Teachings in 3º ESO:

- Differentiate between translation, symmetry and rotation in the plane and construct figures using these movements.
- Recognize the presence of geometrical transformations in nature and in art.
- Identify the key elements of movements in the plane: symmetry axis, centres of rotation, rotation amplitude, etc.
- Create your own constructions by means of manipulating objects and composing movements using technological tools whenever necessary.

Aim of the lesson

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 they will use Art Nouveau drawings from Europeana to produce their own rotational or translational tessellation.

Outcome of the lesson

Students will produce a final product, a work of mathematical art combining tessellation and Art Nouveau. Additionally, students can build a VR museum where they can showcase their final products next to the original Art Nouveau images.

Trends

PBL, STEM Learning

21st century skills

Creativity and innovation, information literacy, initiative and self-direction.

Activities

Name of activity	Procedure	Time
1	PREPARATION – The Mathematics and Arts teacher organize the interdisciplinary activity, setting objectives and timeline, adapting the Learning Scenario if needed and deciding how students’ work will be evaluated modifying the rubric if desired.	1 hour
2	Intro – The Mathematics teacher explains to the classroom of students what the project is about, its outcomes and how it will be evaluated.	30 mins
3	Math Lesson – The Mathematics teacher introduces movements in the plane (translation, rotation and symmetries), its key elements and definitions.	30 mins
4	ART Lesson – The Art teacher explains how to create a translational and rotational tessellation with videos, explaining the work of M. C. Escher. Students go into the Art Nouveau database from Europeana and select an artwork they use for creating their tessellation.	3 hours
5	OPTIONAL – Either the Math or the Art teacher helps students use CoSpaces in the ICT room to create a virtual museum where they can upload their scanned tessellations and the original media from Europeana.	2 hours
6	EVALUATION – The Math and Art teacher evaluate students’ work with the rubric and give feedback to each student.	1 hour

Assessment

	% 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

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

Student feedback

N/A

Teacher's remarks

N/A

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.