

Europeana Learning Scenario

Title

Beautiful and Useful: Bauhaus and Walter Gropius

Author(s)

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Abstract

Students explore Europeana article about Bauhaus. Bauhaus style/movement made a great influence on the art and architecture of the 20th century. It is also famous for introducing origami in the process of learning and teaching. Since origami and mathematics are related, we decided to explore that side of Bauhaus. This lesson was implemented during regular mathematical lessons since origami is a mathematical discipline. There are origami axioms that enabled proof of many mathematical problems.

Keywords

Bauhaus, architecture, origami, mathematics, axioms

Table of summary

<i>Table of summary</i>	
Subject	Mathematics
Topic	The link between mathematics and origami
Age of students	15
Preparation time	2h
Teaching time	45min
Online teaching material	<ul style="list-style-type: none"> • Resource 1 • Resource 2
Offline teaching material	Paper
Europeana resources used	<ul style="list-style-type: none"> • Resource 1

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Integration into the curriculum

This learning scenario was implemented during the mathematics lesson dedicated to geometry with the students of the first year of high school who are required to learn about basic geometric notions.

Aim of the lesson

The lesson aims to explain to students the basic notions about geometry. Students explore Euclidian geometry, but insight to origami gives them a bigger picture of mathematics and geometry. They also see how important is mathematics and that it can be applied in architecture.

Outcome of the lesson

Students will:

- Learn about European cultural heritage
- Get acquainted with the new ideas in science that connect mathematics, origami and art
- Learn advanced mathematical content

Trends

Project-based learning and creativity.

21st century skills

The LS develops critical thinking by connecting mathematics and origami to historical ideas and art.

Activities

Describe here in detail all the activities during the lesson and the time they require. Remember, that your learning scenario needs to use Europeana resources. If you are using any external documents, please scroll to the end of the document and add them to the Annex. Add more rows to the table if needed.

Name of activity	Procedure	Time
Introduction	The teacher explains the steps and activities	5 min
Main activity	Students explore the topic from the historical point of view, reading Europeana blog post about Bauhaus. The teacher presents the idea of using origami in mathematics. Students explore the notion of hyperbolic paraboloid and its mathematical properties.	20 min
	The curved-crease sculptures are known even earlier at the beginning of the 20 th century as a result of Joseph Albers' work at famous art school Bauhaus in Germany, and later in the Black Mountain College. Artist and professor encouraged experimenting with different materials and held a preliminary course in "paper folding". The course had great pedagogical value, and since paper folding allowed students to explore constructions through hands-on activities. Materials, such	15 min

Name of activity	Procedure	Time
	<p>as paper has certain limitations but according to Albers, those constraints should awaken students' creativity. His approach greatly influenced modern architecture, art, and design.</p> <p>Sources: <i>Thesis "A New Unity, the Art and Pedagogy of Joseph Albers" by Esther Dora Adler, University of Maryland, 2004</i></p> <p><i>Budinski N. (2019) Mathematics and Origami: The Art and Science of Folds. In: Sriraman B. (eds) Handbook of the Mathematics of the Arts and Sciences. Springer.</i></p> <p>Students make origami models.</p>	
Conclusion	Students analyze what they have learned. They also explore possibilities to present to the public the idea of connecting mathematics and origami.	5 min

Assessment

Students task was to fold origami that was proposed by Bauhaus.

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

Students presented their work and presented origami activities in the open weekend workshop. It was covered by a local newspaper.

Student feedback

Students liked the activity and [presented this concept](#) in the workshop held in Novi Sad in December 2019.



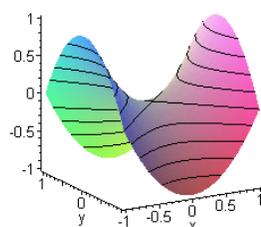
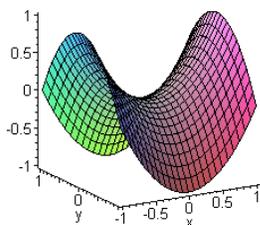
Students explored mathematical properties about Hyperbolic Paraboloid

Гіперболічний параболоїд

Гіперболічний параболоїд то безконечна поверхня у трох димензийох зоз гіперболічними и параболоїдними пререзами. Єдначини хтори то описую

$$z = x^2 - y^2$$

$$x = yz$$



Teacher's remarks

Combining mathematical content and origami is motivating for students. Origami is a mathematical discipline and many mathematical concepts could be supported by origami and hands-on activities. Origami has an artistic component, so it is a good way of connecting mathematics and art.

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.

Annex