

Europeana Learning Scenario

Title

Optical Illusions: Is It Or Is It Not?

Author(s)

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Abstract

The project combines mathematics and other disciplines such as art and biology. It is dedicated to visual or so-called optical illusions. Students can explore visual illusion from the mathematical side, for example, long or short lines or from the biological side and explore the fact why we do not see things as they are. Also, optical illusion has artistic value. The project is suitable for students 12-14 years old. We have found this project suitable for implementation with students from a migrant background at the Migrant Centre. Since we had language obstacles, we chose topics that rely on visual representation.

Пројекта комбинује математику и друге дисциплине, као што је биологија. Посвећен је визуелним/оптичким илузијама. Ученици истражују оптичке илузије са аспекта математике, као на пример дуге/кратке линије или са аспекта биологије, где истражују чињеници зашто ми не видимо ствари како изгледају. Исто тако, оптичке илузије лепо изгледају. Пројекат је намењен узрасту 12-15 година. Пројекат смо спровели са децом мигрантима у Мингрантском центру. Како је језик био препрека у извођењу радионице, одлучили смо се за тему која се у великој мери ослања на визуалну репрезентацију.

Keywords

art, biology, mathematics, migrants, visual illusions

Table of summary

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Subject	Mathematics
Topic	Mathematical shapes
Age of students	12-15 years
Preparation time	50 minutes
Teaching time	1 lesson
Online teaching material	Illusions Explanation of optical illusion Video
Offline teaching material	Paper, crayons

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Integration into the curriculum

This lesson could be integrated into the mathematical curriculum and it is suitable for exploring various geometrical shapes.

Aim of the lesson

Increasing motivation to learn mathematics.

Increasing motivation to learn biology.

Increasing motivation for art.

Illustrating application of mathematical knowledge.

Research about life around us.

Combination of mathematics and biology with art.

Outcome of the lesson

This lesson provides different outcomes. Students gain applicable mathematical knowledge, particularly connected to geometry. Using the informal way of learning and Europeana resources, students obtain information about art trends and the connection of mathematics and art. Students also learn about optical illusion from a biological point of view.

Trends

- Lifelong Learning: learning continues outside of school. Connecting learning content with real-life application. Exploring different sources to find useful information
- Collaborative and interdisciplinary learning: connecting different subjects.

21st century skills

- Learning skills: critical thinking, creativity, communication and problem solving.
- Life skills: exploring different sources of information.
- Social skills: communication.

Activities

Name of activity	Procedure	Time
Active learning with Europeana	Optical or visual illusions have artistic, mathematical, and biological significance. In this part of the lesson, each segment is represented to the students.	Part 1 10 min
Class discussion	<p>The first activity is to explore different optical illusion prepared by the teacher. Students observe and comment about optical illusions and about what they see. The main issue is the difference between what one sees and what is represented. For example, students are shown a set of lines that looks like intersecting, even though lines are parallel. Students are reminded about the mathematical definition of parallel lines. To prove the fact that it is just an optical illusion and that lines are parallel, students cut the paper and conclude mathematical properties by comparing paper pieces. Students explore mathematical shapes and optical illusion.</p>	10 min
	Students are given an explanation about biological facts and why eyes do not see the complete picture. The activity is continued, and students observe different kinds of optical illusions in form of patterns or impossible objects.	10min
	The artistic beauty of mathematical illusions is presented with pictures provided from Europeana resources and Victor Vasarely's art. This artist is well known for the use of optical illusion in producing his art.	
Class discussion	Students make their own optical illusion. The teacher prepares materials such as papers and instruction. For example, students can draw something similar to what they saw in the previous part of the lesson. Another possibility is to make an optical illusion of motion.	Part 2 10 min
	Students cut out two rectangles from the paper and draw a picture on each rectangle. The next step is to tape a pencil on the back of one of the images. Then students should tape images back-to-back. By rolling the pencil students flip images quickly and receive the motion effect of the picture. The teacher explains the idea of flipping one still picture to the next quickly is the way how cartoon works. By flipping so quickly, our eyes can follow, and we can see a moving picture.	10 min
	At the end of the lesson, students present their designs.	

Assessment

Students make their own designs of optical illusion.

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

Student feedback

We have worked with students who speak neither English nor Serbian. We evaluate with a smile checklist and got information that they found the lesson interesting and felt happy about the activities.

Teacher's remarks

It is always good to connect the content that students learn to real-life scenarios. On this occasion, students could learn about visual illusions. Even though students did not speak the native language, we have found a way to communicate.

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.

APPENDIX



Students explore visual illusion and [Europeana](#) materials.

Annex

Lesson evaluation chart

How much did you like the lesson about visuall illusion?



Students creation of visual illusion

