

# Europeana Learning Scenario

## Title

**Descriptive geometry in art and nature**

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## Summary

### Table of summary

Subject	Interdisciplinary (Mathematics, Science, Art, ICT and Physics)
Topic	Descriptive geometry
Age of students	18-19
Preparation time	4 hours
Teaching time	8 hours
Online teaching material	<a href="https://drive.google.com/file/d/0B2VBC-qpA2BOGIKMKJaQU5HSIE/view">https://drive.google.com/file/d/0B2VBC-qpA2BOGIKMKJaQU5HSIE/view</a> <a href="https://www.wolframalpha.com/">https://www.wolframalpha.com/</a> <a href="https://www.europeana.eu/portal/en">https://www.europeana.eu/portal/en</a> Google Documents and Presentations <a href="http://www.parcopollino.it/">http://www.parcopollino.it/</a> <a href="https://www.calabriaportal.com/montagne-della-calabria/pollino/2842-monte-sellaro.html">https://www.calabriaportal.com/montagne-della-calabria/pollino/2842-monte-sellaro.html</a>
Offline teaching material	sheet of paper, drawing instruments, pens, pencils and erasers PC, LIM and microphone
Europeana resources used	<a href="https://www.europeana.eu/portal/en">https://www.europeana.eu/portal/en</a>

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## Integration into the curriculum

In the fifth year of secondary school of the technical economic institute, in Italy, we study the functions of two variables, maximums and minimums, operative research, but we do not study art history, this activity wants to improve knowledge and skills in other STEAM sectors.



## Aim of the lesson

By the end of the lesson, students will be able to:

- sketch and describe surfaces of the given equation; or if the graph of a quadric surface is given, specify the name of the quadric surface, determine the axis of symmetry, maximum and minimum of the quadric surface
- know and describe the importance of quadric surfaces in statics, in nature and in architecture

## Trends

- Flipped Classroom
- STEM Learning
- Collaborative Learning
- Cloud Based Learning
- Project-Based Learning

## 21<sup>st</sup> century skills

- Critical thinking
- Problem solving
- Creativity
- Collaboration
- Communication
- Technology literacy
- Leadership
- Initiative
- Social skills

## Activities

Name of activity	Procedure	Time
<b>Step 1. Introduction</b>	Students read the article at home (flipped classroom): <a href="https://drive.google.com/file/d/0B2VBC-qpAQ2BOGIKMKJaQU5HSIE/view">https://drive.google.com/file/d/0B2VBC-qpAQ2BOGIKMKJaQU5HSIE/view</a>  Students begin to familiarize themselves with the Europeana portal: <a href="https://www.europeana.eu/portal/en">https://www.europeana.eu/portal/en</a>	1 hour
<b>Step 2. Research</b>	The teacher discuss with the classroom, then divides students in groups of 3-4 students and each group is assigned a research to be done on Europeana (e-book, images and videos): <ol style="list-style-type: none"> <li>1. Descriptive geometry (Girard Desargues, Guarino Guarini, Gaspard Monge: "Geometrie descriptive")</li> <li>2. Classification of the quadrics</li> </ol>	1 hour

Name of activity	Procedure	Time
	3. The architecture of Antoni Gaudi and the surfaces used, Art Nouveau and modern architecture 4. Pollino's National Parc (pino laricato, Sellaro Mount) Calabria-Italy, 5. Research of images of bones (the studies of Galileo Galilei), mountains and natural forms that guarantee the static equilibrium	
<b>Step 3. Collaborative writing</b>	Each group writes in collaborative mode on google drive the main elements of research and materials found, with images and links.	1 hour
<b>Step 4. Presentation Discussion</b>	Each group presents and discusses its work with the class, the teacher makes some revisions.  Homework: with the shared materials the students create a presentation on google drive.	2 hours
<b>Step 5. Problem-solving</b>	The teacher formalizes the essential theoretical contents. Students perform group exercises under the teacher's supervision exploring the properties of quadratic surfaces with WolframAlpha.  Homework: exercises to do in pairs (peer education)	3 hours
<b>Step 6. Assessment 1</b>	Individual written test	1 hour
<b>Step 7. Workshop Assessment 2</b>	The students organize and present their work in a workshop to other institute classes, teachers, parents and political representatives.	2 hours

**Assessment**

**Formative assessment:** observation during group work, discussion, questions, review of teamwork.

**Summative assessment:** some exercises such as [this](#) one.

**Summative assessment:** skills demonstrated during the organization of the workshop.

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

**Student feedback**

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**Teacher's remarks**

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## 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.