



Name of the lesson: **Geometry in architecture and history**

Prerequisites	<ul style="list-style-type: none">- smart board- internet connection and direct wi-fi,- students' phones,- computers,- projector- internet source 1: https://deste.gr/exhibition/cultural-geometry/- internet source 2: https://www.barnesandhulme.com/Cultural-Geometry- interdisciplinary lesson/ geometry applied in practice (mathematics+ history+ ICT), the review and practical applications, in order to form the key competences (K1 - K8)
Aims	<ul style="list-style-type: none">- Identification of geometric figures and bodies by photographing the historical buildings of the city;- Discovering the correlations between technologies, building materials, the purpose of the construction and the adopted geometric forms, through discussions with museographers, historians, by searching for information on the Internet;- Studying geometric aspects of architecture by drawing, measuring with geometric instruments and digital processing of photographs;- Drawing conclusions and using the learning outcomes by making PowerPoint presentations with the most relevant photographs and processing, with explanations in the language of the country where is lesson plan applied and in English;- Publication of presentations on the page of an eTwinning project: registration and authentication on a website, uploading photos and presentations, publishing and communicating online.
Students' age	14 – 17 years
Steps	0 – 15 minutes – Explanation and team building 15 – 60 minutes – “Preparation” - photographing the historical buildings in the town 60 – 150 minutes – “Lesson” - studying and processing the photographs and developing a PowerPoint presentation 150 – 180 minutes - “Final stage” - publishing the presentations on eTwinning or presentation in the class
Time	180 minutes (3 hours)



Methods and teaching strategies:

- Mainly learning and assessment will be carried out by the project method, each group of students will carry out a project entitled "Geometry in architecture and history"
- The project will be done in 3 stages: preparation - photographing the historical buildings in the town, the lesson itself - studying and processing the photographs and developing a PowerPoint presentation, the final stage - publishing the presentations on eTwinning (the ECHRE project);
- Teamwork - students will form project teams with 5-6 members, taking care to have "experts" from all the targeted areas (geometry, history, use of technologies, own language and English languages, but also leaders, organizers, motivators).

Internet sources:

Only in Romanian - https://issuu.com/laurahasmatuschi/docs/disertatie_finala_pagini_separate

In English - <https://deste.gr/exhibition/cultural-geometry/>

In English - <https://www.barnesandhulme.com/Cultural-Geometry>

Key competences:

K1: Native language - medium level (students will build messages to describe the pictures of buildings and their geometry)

- K2: Modern languages - basic level (key information will be translated into English for publication in an eTwinning project)

- K3: Mathematics and Sciences - advanced level (students will discover applications of geometry in architecture, identifying and explaining the opportunity of the presence of geometric figures and bodies studied in the architectural structures of the city, in connection with the technologies and materials existing in the construction era)

- K4: Information and Communication Technologies - medium level (will be used in the preparation phase for photographing buildings and capturing relevant aspects, during the lesson, in preparing the presentations, and in the topic, when the presentations will be published on eTwinning)

- K5: Learning to learn - level (students will learn to discover history by effectively visiting historical objectives and questioning curators, will be encouraged to search for essential information on the internet, from credible sources, for example wikipedia or historia.ro)



- K6: Social skills - advanced level (by encouraging teamwork and effective participation of all students at team activities)

K7: Cultural expression - medium level (facilitating the knowledge of the city's history through the chronological study of the city's construction stages, increasing the motivation by finding the stories of the old buildings and the historical characters involved)

- K8: The spirit of inventiveness and entrepreneurship - the basic level (students will be stimulated to anticipate ways of developing the city by capitalizing the city's rich cultural heritage)

Operational objectives:

- Identification of geometric figures and bodies by photographing the historical buildings of the city;
- Discovering the correlations between technologies, building materials, the purpose of the construction and the adopted geometric forms, through discussions with museographers, historians, by searching for information on the Internet;
- Studying geometric aspects of architecture by drawing, measuring with geometric instruments and digital processing of photographs;

Drawing conclusions and using the learning outcomes by making PowerPoint presentations with the most relevant photographs and processing, with explanations in Romanian and English;

- Publication of presentations on the page of an eTwinning project: registration and authentication on a website, uploading photos and presentations, publishing and communicating online.

Learning activities:

1. Preparation stage:

- Explaining the topic and team building
- Photographing historical buildings in the town
- Gathering specific information from the site, from teachers or from the Internet.

2. The lesson itself:

- Explain the term "cultural geometry" and exemplify with photos;
- Study the geometrical elements from the photographs collected by measuring, drawing and digital processing (zoom, crop, insert comment), comment and conclude;



- How is geometry applied in architecture, how can it characterize a complete cultural expression, how does it relate to the other sciences involved?
- How does geometry contribute to the construction of a cultural heritage; how can cultural patrimony be used for the sustainable development of the local economy?
- Create a PowerPoint presentation with the most interesting photos and / or works to be published later on the eTwinning project ECHRE

3. Final stage - homework:

- Provide the teacher with the email address for eTwinning registration
- Finish the presentation and upload it on the Internet
- Log in to the eTwinning page of the ECHRE project (European Heritage: Resource for Education) and publish the presentation
- Read other presentations and comment with your colleagues from other European countries.