Era's muse

New Era's Museums: STEAM Teaching Environments for Secondary School Education

IMMU – IMAGO MUNDI (The World's Image)

With the support of the Erasmus+ Programme of the European Union

IMMU – IMAGO MUNDI
(The World's Image)-
Are you sure to know really how the world is?

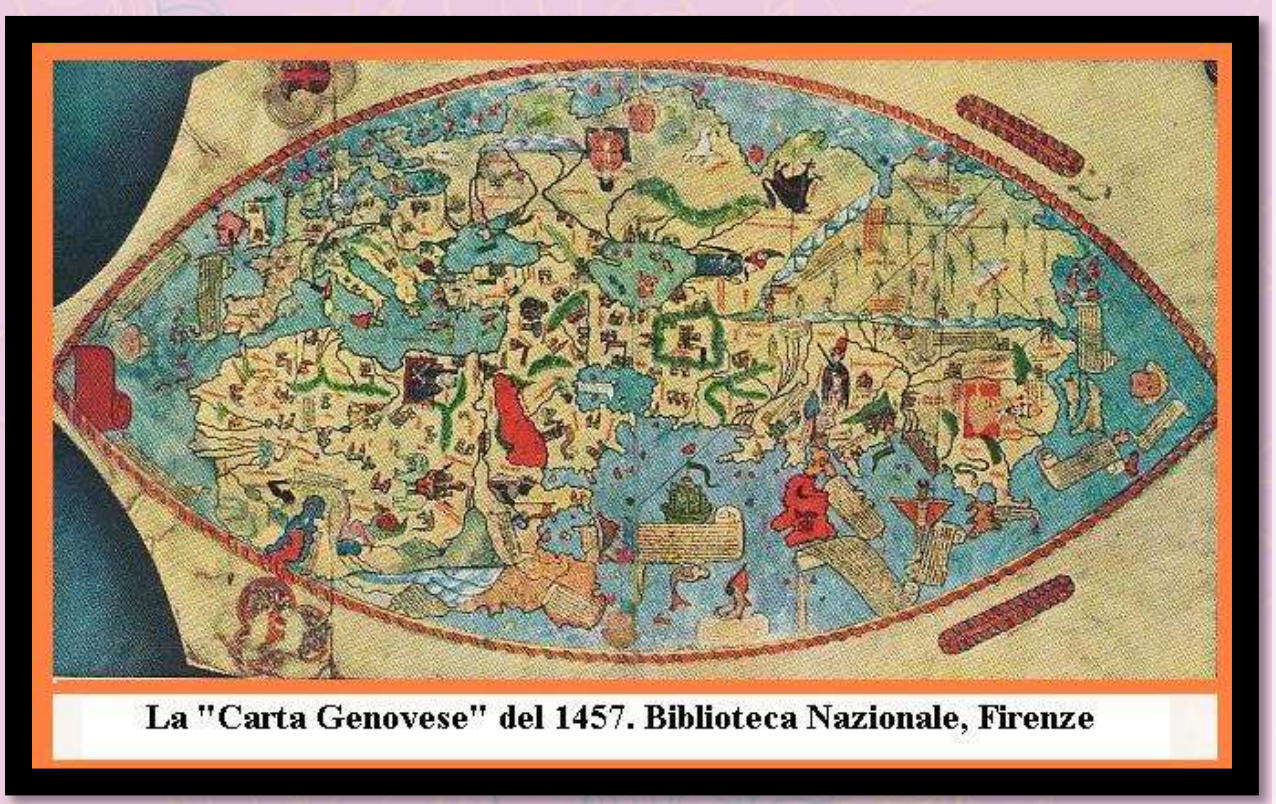
- The project IMMU – IMAGO MUNDI (The World's Image) - aims to introduce the new **STEAM** methodology in the curricular activity throughout the interaction of different **subjects: History, Geography and Math**.

- It aims at making students aware of how their own **idea of the world** is reflected on the shape of the globe represented on a geographical map. Since ancient times, people have always felt the need to shape the world according to their culture (knowledge, beliefs, etc).

What is the right map of the world?

Geographical maps can be realized in different material supports (stone, paper, wood) based on their antiquity.

They can represent a piece of land as it is **known or imagined** during the time and they have **different purposes**, not only travelling as one might expect.


La "Carta Genovese" del 1457. Biblioteca Nazionale, Firenze

This work is addressed to pupils 14-18 aged, however in an easier way could be run even in a primary school.

Subjects objectives (History- Geography- Math):

- to understand a particular point of view (knowledge and beliefs) represented in a map.
- to recognize and explain people's different ideas;
- to make appropriate use of historical, geographical terms;
- to understand the use of Cartesian axes and the technique of scale representation;
- to understand how to draw a geographical map using the cardinal points, meridian and parallel;
- to select, organize and use relevant information to produce well-structured work.

Thinking skills involved (from lower to higher):

1. To **observe** different geographical representations (from the past to the new ones).
2. With the help of a research-form, students **analyze and collect** them and **highlight** the important aspects.
3. To **understand** how to realize geographical maps.
4. To **discuss** which map today is the better representation of the World/or **organize** them with relevant criteria in a museum area (**creativity – critical thinking**).
5. Integrated skills activity; teamwork; problem-solving; **assess** and **evaluate.**

Language Aims:

Glossary: to present a lexical set on the geo-historical, science and mathematical field;

to devélop and integrate the different abilities (writing, listening, speaking, reading).

Materials: Photos, handouts, research-form, maps, smartboard;

Evaluation: it will be assessed the final product: criteria to discuss and take a decision; teamwork cooperation; self-evaluation.

Final Product: Basic – Intermediate approach VS Advanced approach

The different scenarios for microMOOCs are laboratory-based experiences and have a high degree of interactivity. The key role in making successful the proposed activity is played by the choice of the topic and of the learning environment. All phases of the 5E cycle model (**Engage, Explore, Explane, Evaluate, Extend**) are included, but with different amount of difficulties and support provided by the teacher.

Time: 2 lessons (4 hours).

- **Final Product**: Scenario 1 - 2 : Basic - Intermediate approach

  To discuss criteria to choose the right map of the contemporary World.

- The teacher provides students with the question, shows the use of the remote/virtual lab, illustrates the procedure and the method.
- The teacher introduces students to the experience of conducting investigations, or to practice a specific inquiry skill, such as the **collecting** and **recording** of data.
- The novelty is represented by its **contextualization** in real-life environments (**Engage**).
- The students generate an explanation supported by the evidence they have collected by experiencing the remote/virtual lab by themselves.

Time: 2 lessons (8 hours)

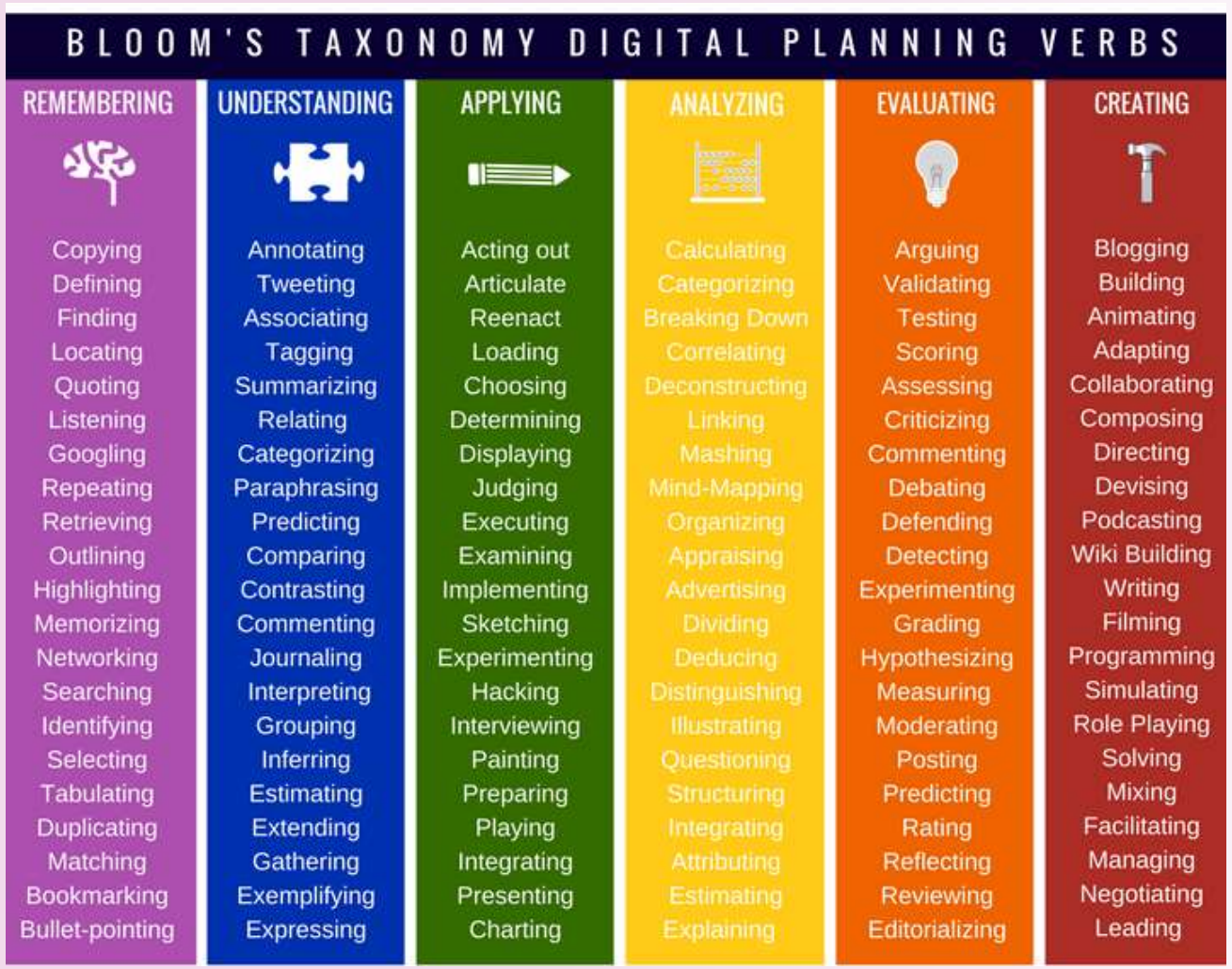
- **Final Product**: Advanced approach

  To create a museum with 4 exposition areas (virtual or real) based on the criteria of presenting the maps, discussed by students in teams.

- The teacher takes the role of defining the context for inquiry by presenting a multidisciplinary view of a theoretical problem and a real-life phenomenon.
- Subsequently, he/she stimulates the students to define their relevant questions, design and carry out their independent investigations, construct coherent explanations, communicate and share their results.
- An open inquiry-based instruction is more efficient to reinforce learners' reasoning skills.
- Through self designed and stimulated exploration students make hypotheses, test their own predictions, and draw their own conclusions; they should reach higher levels of autonomy and develop higher-order thinking skills.

Why IMMU could be a "good" microMOOC topic?

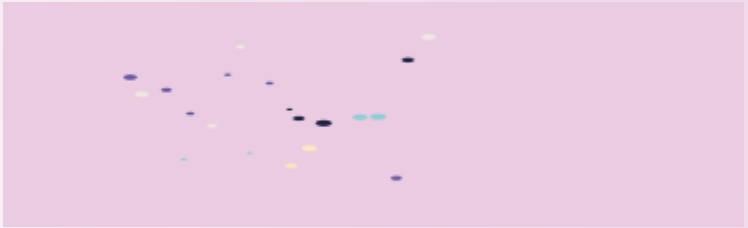
1. It provides effective engagement to students;
2. It generates curiosity and leads to questions;
3. It generates a critical thinking;
4. It invites students to scientifically investigate;
5. It creates scientific and historical knowledge;
6. It requires students to use inquiry skills to explain the phenomena;



What does it consist of? How it works?

Engage

- At the beginning of the activity, the teacher shows some pictures related to very unusual or odd maps.
- Pupils will be then invited to guess the original country and the period in which they were created.
- In team, they have to find out the maps' point of view and investigate who built them and in which period.
- They discuss what is relevant in the maps, for what purpose they were made.



How to describe a map

World's Map n° .....

The World is …

In the Center there is/are

.....
.....

The continents represented are

.....
.....

I can recognize

.....
.....
.....

At the top there is/are

.....
.....
.....

What is different from today?

.....
.....


Oriens
MARE
ASIA
Sem
Mare magnum siue
EVROPA
Iafeth
AFRICA
Cham
Occidens
alamy

Worlds Maps : Which one are you observing?

N°	*Period*	*Who did it …*	*The World is ...*
	2000 aC	Sumer	
	II sec. aC	A Greek geographer from Alessandria, Claudio Tolomeo	
	III-IV sec.	Romans	
	VII sec.	the Christian monk Isidoro di Siviglia	
	XII sec.	Europeans	
	XII sec.	An Arab geographer, Al-Idrisi	
	XV sec.	Aztecs	
	XV sec.	Europeans	
	1587	A Dutch geographer, Gerardo Mercatore	
	1977	A German geographer, Arno Peters	
	2005	Brasilians	
	2005	Chinese	

Is the Earth flat?
What is the shape of the World today?

Explore

- Pupils are provided with different contemporary representations of the World and they try to understand which one is the right one and why. They observe and discuss together the reason of the different views.

- Why all world maps are wrong?

Making accurate world maps is mathematically impossible.

https://www.youtube.com/watch?v=kIID5FDi2JQ

Explore the true size of the Countries

https://www.thetruesize.com

Explain

- Pupils are provided with a math practical lesson to understand the use of a scale representation by the Cartesian axes and they practice on that.
- How it is possible to transfer a spherical surface on a plane one? Which kind of maps use different projection ways? How Meridians and Parallels work?

Extend

Basic - Intermediate approach

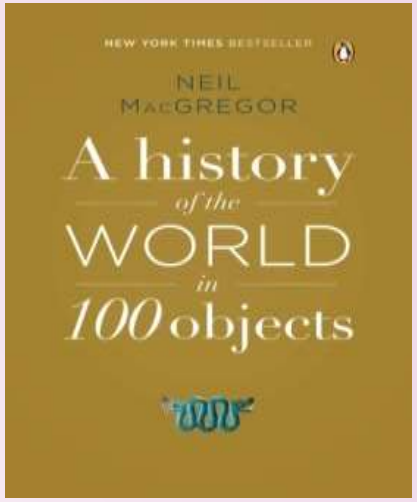
- Students (in groups) are asked to discuss in an imaginary "World meeting" to choose the map to represent the World. (Maps and racism)
- They are invited to present their position in a public speech.
- The better solution will be voted.

Advanced approach

- Students (in groups) are asked to organize the exhibition “The World Image” and to divide the maps into 4 spaces, identifying the criteria.
- They discuss and make their decisions.

What about History and Geography in a STEAM curriculum? Are they Science? Of course, they are Social Science Some methodological hints

- In the perspective of a STEAM activity, It is useful to take in account the lesson of the **Touching History methodology**, devèloped especially by the British Museum director **Neil Mac Gregor**, who wrote “A History of the World in 100 Objects” .



- “History through objects gives the opportunity to travel (…) back in time, and across the globe, to see how we humans over 2 million years have shaped our world and been shaped by it …”.
- “Telling history through things, whether it's an Egyptian mummy or a credit card, is what museums are for…”.
- “Of course, it can only be "**a**" history of the world, not "**the**" history. When people come to the museum they choose their own objects and make their own journey round the world and through time, but I think what they will find is that their own histories quickly intersect with everybody else's, and when that happens, you no longer have a history of a particular people or nation, but a story of endless connections…”.

Some methodological hints….

This kind of study was introduced in Italy by the university Professor in didactic of History **Antonio Brusa**, (University of Bari "Aldo Moro")

who collaborated with **Joan Santacana Mestre**, the author of the book *Fare storia con gli oggetti. Metodi e percorsi didattici per bambini e adolescenti* (Make History through the objects. Methods and didactic paths for kids and Adolescent) along with **Nayra Llonch Molina**.

J. Santacana Mestre is a Catalan archaeologist and university professor and leading researcher in the field of didactic and interactive museography.

Nayra Llonch Molina is a Professor aggregated in the field of Didàctic of Social Science at the Catalonia University.

Objects have a story and they can show it to us
Some methodological hints….

According to A. Brusa:

- Objects are a **source** for knowing past and present aspects of society.
- Objects are a **tool for teaching** aspects of past and present society (the student enters the historian's way of thinking and tries to imagine something of the society that produced that object).
- This type of history refers to **experimental archeology** which sought to understand how the objects of the past worked, putting itself from the point of view of those who produced the objects.
- Historiography has developed since the 1960s a branch called "**material culture**" which aimed to understand the culture of objects. Opened this type of study the great French historian **Marc Bloch,** who enlarged the range of sources, which in the past was limited to written testimonies.

What kind of culture is behind a plow or a geographical map?

- Each object refers to men who know how to imagine it and a society for which that object works, has a use. It is not possible to make a plow without the culture of iron, wood and soil.
- Starting with Bloch, everything can be a source for the historian, everything can tell us something.
- Bloch said that the historian must work with the blacksmith and, I say, if the sources are geographical maps with the cartographer or the philosopher or the merchant or a diplomatic. This is like in the STEAM enviroment.

How objects tell us …
THE DOUBLE ANALYSIS OF OBJECTS
Objects need to be questioned appropriately. What kind of questions?

- According to A. Brusa

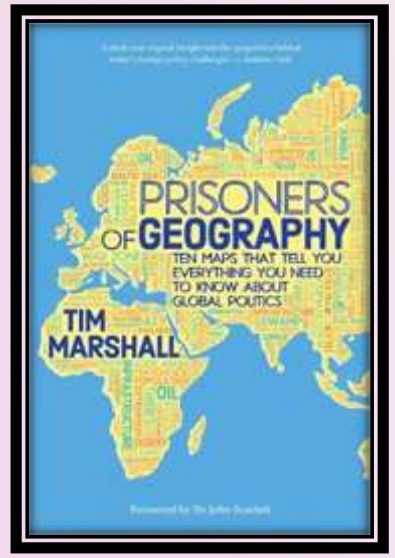
STRUCTURAL	FUNCTIONAL
What is it made of, who built it, where it was built, what culture was needed to build it.	What is it for, who used it and why they used it, in which culture its use is necessary.

• This mental structure can be present in everyone, even in those who do not make history, **to learn to question objects.**

• When we go to **a museum**, we can read the label, but we can also investigate objects and learn to listen to them.

Other operations on objects are:
Contextualization :What happens at the same time?
Spatial Collocation and temporal collocation in a line of devèlopment.
Interpretation: to understand the source and the society that produced it.

About Geography … a critical approach
https://orangotango.info/critical-mapping/



Critical Mapping

- Based on a long tradition of counter-cartographies from the fields of art, science and political activism, they use the power of maps to make marginalized perspectives visible.
- Collective mapping is a playful tool to take a joint look at spatial structures and processes, to question power and power relations and to devèlop perspectives for emancipatory approaches.

And at the end…
Is STEAM something really new?
I don't think so!

- Here is **Galileo Galilei**, (1564 - 1642), an Italian astronomer, physicist and engineer and a polymath. Galileo has been called the "father" of observational astronomy, modern physics, the scientific method, and modern science. He was educated in logic (philosophy), literature he also studied disegno, fine art, and, in 1588, obtained the position of instructor in the Accademia of Fine Art in Florence.

And what about the first STEAM activity?

•Maybe these are his two lectures **On the Shape, Location and Size of Dante's Hell** in an attempt to propose a rigorous cosmological model of Dante'Hell.
Math and Literature together as in a STEAM project!

• Being inspired by the artistic works of the **Renaissance** artists, Galileo acquired an **aesthetic mentality**. He represented the **Renaissance culture** with a **Human-Centered-Design.**

two lectures

Bibliography and sitography:

- Marco Cecalupo, *Laboratorio "Le carte del mondo",* (associazione Historia Ludens)

- Neil Mac Gregor, A Time Team History Through Objects https://www.youtube.com › watch

  A History of the World in 100 Objects, Paperback – Deckle Edge, 2013

- Joan Santacana Mestre e Nayra Lionch Molina*, Fare storia con gli oggetti. Metodi e percorsi didattici per bambini e adolescenti*, Carocci 2022.
- Antonio Brusa, Historia ludens- Didattica della storia - Il laboratorio didattico. La grammatica dei documenti. Come lavorare in classe con i documenti– https://www.youtube.com/watch?v=HL1DUB_IWAQ&list=PLVT6Gf327wRFclIHzB1JPQFMzifHrbZtg&index=7

- **Timothy John Marshall,** The Power of Geography - Ten Maps That Reveal The Future Of Our World (2021)
- https://orangotango.info/critical-mapping/ Based on a long tradition of counter-cartographies from the fields of art, science and political activism, they use the power of maps to make marginalized perspectives visible.

“Be Human, at your best
To create a better World”.

Thank you for your attention

Renata Colomba, teacher of History and Philosophy
Roberta Accardi, teacher of Italian Literature

Liceo Scientifico Stanislao Cannizzaro di Palermo (Italy)