

Europeana Learning Scenario

Title Eureka! Materials and objects... a closer look

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Summary

Many objects around us are made of metal, which is very hardwearing and lasts for a long time. So metal is used for different objects.

Finding the density of irregularly shaped materials and checking (i) the purity of the material or (ii) the material that the object is made from, is an important application learnt in Science/ Physics teaching.

This activity uses a set of 2 'Detective Cards' for a group work activity in class, each one linked to the above missions. The class can be subdivided into small groups of about 4 members using the same 2 Detective cards. A story on Archimedes at the beginning of the lesson shows the importance of the mission needed by each group, following which students can also shout 'Eureka' like Archimedes. Archimedes found that he could solve the dilemma for his king. Check out:

<https://physics.weber.edu/carroll/Archimedes/crown.htm>

Table of summary

Subject	Integrated Science (Year 7 or Year 8), Physics (Year 9) - Density English [comprehension and discussion] (Year 8) - Comprehension/Discussion Art
Topic	<u>Physics/Science</u> : Density <u>English</u> : Comprehension/ writing an advert on social media

	<u>Art</u> - coin rubbing painting
Age of students	11 -13 years
Preparation time	20 minutes
Teaching time	45 minutes for each of the 3 subjects
Online teaching material	Edmodo, Europeana
Offline teaching material	<p>Science/ Physics pen, pencil, ruler, foolscap (1 per student), measuring cylinder and or displacement can with water, 'Detective card', metal objects, string.</p> <p>English Use of Interactive Board to project Europeana text or exemplar of advert on social media.</p> <p>Art pencil, coins, rubber, blank sheet(s).</p>
Europeana resources used	<p>https://www.europeana.eu/portal/en/record/9200579/syff3xw9.html?q=archimedes#dcId=1548000185785&p=1</p> <p>https://www.europeana.eu/portal/en/record/2048087/ProvidedCHO_British_Museum_and_The_Portable_Antiquities_Scheme_SUSS_5BD690.html?q=silver+coin#dcId=1548000185785&p=1</p> <p>https://www.europeana.eu/portal/en/record/2048087/ProvidedCHO_British_Museum_and_The_Portable_Antiquities_Scheme_DENO_EED901.html?q=silver+coin#dcId=1548000185785&p=2</p> <p>https://www.europeana.eu/portal/en/record/2084002/contributions_20814f10_d79d_0136_9dce_6eee0af7d2fa.html?q=brass+tag#dcId=1548000185785&p=1</p>

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Integration into the curriculum

Detail in a few sentences how the topic of the learning scenario will fit into your national curriculum.

Finding the density of an object is part of the Year 9 Physics curriculum (in Malta). Students will be given a design question task, linked to the story they read about, to learn how to adapt what has been learnt in theory to a different real life scenario.

Aim of the lesson

Physics/Science

To identify (i) the purity of a material and or
(ii) the material from which an object is made up.

English

Migrants and their belongings

Art

Coin rubbings.

Trends

- Collaborative learning
- Flipped classroom (use of Edmodo)
- STEM Learning
- Digital skills
- Story telling
- Global awareness

21st century skills

Through this task, students are subjected to the following 21st Century skills:

- Cooperation
- Creativity
- Communication
- Critical thinking

Activities

This learning scenario is a cross-curricular approach to the subjects mentioned to enable students to relate science and archeological artifacts to people and creativity.

Name of activity	Procedure	Time
<p><u>Physics/ Science</u></p> <p>Design Question Task</p>	<p>1.The story of Archimedes is related to the class (which happened in Syracuse, Sicily in relation to Greek Tyrant Hiero II.) Text at https://physics.weber.edu/carroll/Archimedes/crown.htm is projected on the board as it is concise and or a video of the story shown from YouTube.</p> <p>2. Class is subdivided into teams of not more than 4 students. A 'Detective Card' and all apparatus listed above is prepared for each team and students read through the card to familiarize with their own question.</p> <p>3. Reference is made to material shared on Edmodo throughout the topic of density relating to the equation $\text{density} = \text{mass}/\text{volume}$.</p> <p>4. Available tablets are used to link to the Europeana website linked to each scenario in the 'Detective Card'.</p>	<p>8</p> <p>5</p> <p>2</p>

3

5. Students discuss and come up with a solution to the question in the Detective Card (below) in their team. They are each asked to present on a foolscap what they suggest in their group in the following manner:

- (i) a labelled diagram of the setup,
- (ii) the method,
- (iii) at least two precautions needed in their task.

15

Conclusion

A general solution for Archimedes' story (as applicable to each situation in the 'Detective Card') is then outlined through a class discussion.

7

Detective Card 1

A treasure chest has been recovered from a shipwreck off the Maltese coast. Inside it several silver coins have been retrieved. As you can see from the following link, they are worn and discoloured.

https://www.europeana.eu/portal/en/record/2048087/ProvidedCHO_British_Museum_and_The_Portable_Antiquities_Scheme_SUSS_5BD690.html?q=silver+coin#dclid=1548000185785&p=1

https://www.europeana.eu/portal/en/record/2048087/ProvidedCHO_British_Museum_and_The_Portable_Antiquities_Scheme_DENO_EED901.html?q=silver+coin#dclid=1548000185785&p=2

You are asked by the National Archaeological Museum to check if the coins are truly made of silver. Design an experiment to identify whether the material of the coins is actually silver. In your answer include:

- (i) A labelled diagram of the suggested setup. (4 marks)
- (ii) The procedure that needs to be followed. (4 marks)
- (iii) Two precautions necessary to render a successful result. (2 marks)

English

Detective Card 2

During your visit to the London Museum, you are shown an identification tag given to the museum by Mr M.O'Halloran. Read all about his story at

https://www.europeana.eu/portal/en/record/2084002/contributions_20814f10_d79d_0136_9dce_6eee0af7d2fa.html?q=brass+tag#dcId=1548000185785&p=1

The Curator of the museum wants you to identify the material from which the tag is made. It is suspected that it is made of gold.

Design an experiment to identify the tag's material. Any data sheet that you require after the experiment relating to the material is available in the Museum's lab.

In your answer include:

- | | |
|---|-----------|
| (i) A labelled diagram of the suggested setup. | (4 marks) |
| (ii) The procedure that needs to be followed. | (4 marks) |
| (iii) At least two precautions necessary to render a successful result. | (2 marks) |

3

1. Introduction

The teacher introduces the following story as an example of how a person can recall his past experience and memories to share them with others.

The text from Europeana website is projected on the Interactive Whiteboard and the topic is introduced.

https://www.europeana.eu/portal/en/record/2084002/contributions_20814f10_d79d_0136_9dce_6eee0af7d2fa.html?q=brass+tag#dcId=1548000185785&p=1

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2. Each student is given a copy of the text for a comprehension pair work exercise. Students take turns to read the text out loud.

3. Think-Pair-share comprehension task is done as classwork, using the following questions:

Questions:

- i. What was the country of origin of the narrator?

ii. How do you understand that it is a male person recounting his experience in this passage?

iii. Why did the narrator have to change his country?

iv. In which century is the story based? What was happening around the world then?

v. Who do you think influenced the narrator's first career?

vi. Does the narrator like the identification tag and its memories? How do you know?

vii. What else did the narrator do in his life?

viii. Which city in the UK does the narrator associate most of this experience with?

ix. What qualities do you attribute to the narrator from this experience?

x. How does the city life contrast his home town?

10

4. Teacher collects the classwork task. Then he/she poses the question for a class discussion:

"What kind of changes do you think the narrator had to adapt to in his new life in the UK to settle down there?"

Art	<p>5. <u>Conclusion</u></p> <p>The following Writing task sheet is given for Homework:</p> <p><u>"In the passage, the narrator had to adapt to the city life and a different lifestyle along the years to settle down in the UK. Research on why immigrants need to relocate and write an essay or an article for social media of about 250 words in which you outline the changes that they have to adapt to in the new country to enable them to settle down in that country."</u></p>	2
	<p><u>Introduction</u></p> <p>Teacher shows an exemplar of an Art composition that includes coin rubbings. Different coins are shown (which can be from different countries).</p>	5
	<p>1. Demonstration on coin rubbings from available resources.</p>	5
	<p>2. Students' questions are addressed.</p>	20
	<p>3. Students are encouraged to do their own artwork as a classwork task using available coins from different countries (teacher indicates a few countries).</p>	8
<p>4. <u>Conclusion</u></p> <p>For the take home task, the students are given research work to learn on the shape and size of coins used in a country of their choice.</p>		

Assessment

Physics/ Science

To get level	Criteria checklist :	Self-assessment	Teacher assessment
1	I have drawn a neat diagram. (/1 mark)		
	I have designed a setup showing use of different instruments. (/1 mark)		
	I have labelled all apparatus in the setup. (/1 marks)		
2	I have described how to measure different quantities to be measured. (/2 marks)		
	I have explained two precautions needed in this experiment to ensure a successful result. (/2 marks)		
3	I have explained the relationship between the two variables enabling the identification of the purity of the material <u>or</u> the material from which the object is made. (3 marks)		

Peer assessment at the end of the group work task through the discussion raised.

Foolscaps are collected (1 per group) and a mark is given out using the above assessment criteria.

English

Success Criteria:

- do the tenses agree? (present/ past or future) 2 marks
- are there adjectives with nouns where appropriate? 2 marks
- was punctuation used adequately? 2 marks
- is there a flow in the ideas presented? 3 marks
- is there an introduction, body (2 paragraphs) and conclusion? 1 mark

Art

Peer assessment can be used for this task (out of 10). Teacher also gives out a mark out of 10 and the total amount of marks is added from both assessments. (out of 20)

Success criteria for both teacher and peer assessment (if applicable):

- | | |
|-------------------------|---------|
| - creativity in artwork | 4 marks |
| - colour scheme used | 4 marks |
| - neatness | 2 marks |

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

Students' feedback

Physics/ Science

Using smiley faces on the foolscap collected for Science/Physics enabled the students' feedback. Overall the students enjoyed the stories involved in this task as the lesson unfolded.

The use of group work for this task was an effective pedagogy that enabled students to think about different ideas and evaluate what was discussed before writing down their own solution.

Students' use of smiley faces is an easy way to ensure that the teacher has a good understanding of the students' progress especially in important tasks such as in the design question set here.

English

The use of the Europeana website for the story proved to be a different scenario for the comprehension task which was enjoyed by students. The Think-Pair-Share group work was effective as students could discuss and refine their answer before writing it down.

What was interesting following this task were the following points:

- two students researched on the native town in Ireland which they came across in the passage: Kilkenny. In the next lesson, spontaneously, they were eager to share information about the setting of this rural village using printed pictures that include the castle therein. Some of their peers asked if it was part of the set for Harry Potter film that was then checked online in class.

- another student remarked that in Ireland there was a historical aspect to surnames starting with "O'" that is quite complex. Also that the apostrophe was originally on the letter O (Ó) not after it. (This student happened to have relatives living in Ireland in fact). Other students then remarked that in Malta we have *O' Neill, O' Brien*, etc... which are familiar to us and therefore have Irish roots.

It was good to note that this task made for research and further interest on the part of students, following a different approach in class through the task.

Re the writing task given, a few students were seen to have reflected more on the problem of migrants and now felt empathy towards them when they appreciated the difficulties they would face to relocate.

Art

Students enjoyed this task and were seen to be more observant to different textures to use for a similar artwork. It became evident through this task that students lacked exposure to crafts at a younger age and that this simple idea as part of the artwork proved to be innovative.

Following a current issue that is regularly in the news (Brexit) it was seen that a number of students chose to research on the English coins still in use. Following the home task, students' research work was displayed in the school to raise awareness of some coins from different countries.

Teacher's remarks

Following the three different lessons, it was great to consider a cross-curricular approach as it gave teachers the opportunity to work together. Also interesting was the outcome of the three tasks that fit into the curriculum using a different approach.

Teachers realized that with some creativity, determination and the appropriate cultural websites from Europeana, lessons can become richer and students benefit more from the learning that takes place.

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.