Europeana Learning Scenario

Title

True Crime - AR Eyejacked!

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Abstract

The Bonnot gang, also known as the "Auto bandits" was an anarchist group of men and women who, in fact, invented the "getaway car" and were the first to use military-grade weapons in a criminal act. All this led to new things in forensics, invention of modern mugshot pictures, including the use of galvanoplastic compounds to preserve footprints, ballistics, and the dynamometer, used to determine the degree of force used in breaking and entering.

Using original mugshots of the Bonnot gang with integrated Augmented Reality, elevates a static worksheet to an immersive experience. Students learn about history of the gang using an AR app Eyejack while solving Math problems.

There are 10 math problems with multiple choice answers. Each answer leads to a clue. By completing all the problems correctly, writing down the clues in Who-What-Where worksheet, students get a final solution – who committed the crime, what the crime was and where it was committed.

Having live worksheets makes students unaware of the main aim: practicing math.

Keywords

Math, AR, forensics, history, STEM

Table of summary

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Subject	STEM, English, History, Social Studies
Topic	Science – forensics in use Math - Simplifying Algebraic Expressions Technology – using apps for immersive experience (Augmented Reality) English – past tense contrast, new vocabulary, writing an essay, skills round up History – pre-war events WW1 Social studies – Crime and punishment, social groups – illegalists and anarchists

Age of students	14-17
Preparation time	10min
Teaching time	45min (+optional 45min if writing activity is not for homework)
Online teaching material	Eyejack app (available for iOS and Android) Mugshot book (can be used online or offline) Europeana blog, story about True crime, policing and punishment in Belle Epoque France The Bonnot gang from Wikipedia Reflection – a feedback made in survey monkey tool
Offline teaching material	Newspaper article - article about mugshot creator Mugshot book (can be printed out and used offline) Who-what-where worksheet English task – Writing choices
Europeana resources used	Europeana blog: True crime: policing and punishment in Belle Epoque France M. Bertillon Bande Bonnot – photo 1 Bande Bonnot – photo 2 Bande Bonnot – photo 3 Bande Bonnot – photo 4 Bande Bonnot – photo 5

Integration into the curriculum

The learning scenario takes a cross-curricular approach.

In the national Math curriculum for the 1st grade (15-year-old students) there is a unit "Algebraic expression", in which students need to gain skills of recognizing the binomial identities, use them in various ways and simplifying algebraic expressions with factorization.

In the English language national curriculum there is a unit for students to analyze a custom text in writing. Also to communicate in formal and non-formal situations, therefore, it fits in any of English lessons.

Also, the History curriculum contains a whole year unit on WWI, which covers the topic of political and social events in Europe before WW1.

This lesson can be used for a wide range of Social studies as well covering a topic on various social groups, illegalists and anarchists.

ICT has a unit on using new technologies and apps, in which this scenario fits perfectly with using AR app Eyejack.

Aim of the lesson

The aim of this interdisciplinary lesson is to practice binomial identities, learn about forensics, gain new vocabulary in English and get the idea of prewar French society.

Students develop all language skills (reading, listening, speaking, writing).

Outcome of the lesson

Students will be able to expand and to factorize expression using algebraic identities, simplify an algebraic expression and apply laws of exponent to simplify the expression. Also, they will be able to name some forensic procedures throughout history and explain what mugshot is.

Trends

Project based learning - students get fact-based tasks, problems to solve as they work in a pairs. They need to investigate and respond to an authentic, engaging, and complex challenge and, as a result, students develop deep content knowledge as well as critical thinking, creativity, and communication skills

Augmented reality – information is given throughout an immersive experience

Stem learning – the focus is on Mathematics and forensics

Edutainment – playful learning, learning while having fun

BYOD – students bring their own mobile devices

Student-centered learning – the work is led by students, the teacher is in a facilitator role

21st century skills

The learning scenario develops and improves students' 4C skills (critical thinking skills, communication skills, collaboration skills, creativity) and ICT literacy.

Name of activity	Procedure	Time
Introduction	The teacher initiates a short discussion with students about students' prior knowledge of the pre-war situation in Europe (WWI), about the history of forensics and asks students if they know who invented mugshots. After that the teacher hands out the newspaper article, the mugshot book and the who-what-where worksheet (if offline, the printed option is used. If not, the link to the article and mugshot book is provided). Also, here the teacher checks if all the students have an Eyejack app installed. The students work in pairs.	2-3min
Reading	Students read the newspaper article about Alphonse Bertillion, the inventor of some forensic procedures. A short discussion is held about him and his inventions.	10min
Eyejacking	Using a mugshot book with Eyejack app the AR content comes to life. Students scan the QR code beside each mugshot and activate the animation over mugshot. **(The QR codes provided in the mugshot book are not ordinary QR codes and will not work with usual QR-scanners, only with Eyejack app)** Each animation shows one math problem and 4 multiple choice answers with clues attached to it. In order to obtain the right clue, they need to solve correctly a math problem and choose the right answer. All of the solutions and clues need to be noted in who-what-where worksheet. After checking off Who, What and Where, there remains one clue in each column. The remaining Who, What, Where is a true crime committed by a member of the Bonnot gang that took place in a given location and also the final solution.	30min
After math	The final solution is given to students. They need to self-evaluate their work using rubric. (given in Annex)	2-3min
Writing choices	This is a writing activity intended for homework. It can be done in class too. The students are given nine choices about what they want to write about. They choose from this rubric. Their writing should be illustrated with Europeana resources according to the rubric.	optional 45min

Assessment

Students use the self-assessment rubric for math problems and clues. (in Annex)

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

Student feedback

After the lesson, students are provided with a link to an online survey.

There are five questions about overall satisfaction with the lesson, app and math problems. There is also a question in which students can freely write their impressions.

Teacher's remarks

The lesson was a great motivator, for the students and for me as a teacher. They had never before used an AR app or had an AR experience. So this was a very fun part of this lesson, when mugshots came alive with all the animations. There were a lot of enthusiastic "WOW" exclamations. But even if they had had an AR experience, I think it would be the same, because of all the "animated math", as they called it. The great thing is that they did not have that usual attitude towards doing Math. The Math is wrapped under AR, criminals and finding clues. Some students said I had tricked them in doing Math. They loved the animated worksheets, and the theme too. The homework was done with a lot of enthusiasm and joy. The students were motivated to do research on forensics and the Bonnot gang even more than asked.

The math problems do not ask for a high level of English, so they did the Math part. But the vocabulary, and analysing the texts in English for some students was an issue. So if students are not quite good at English, I wouldn't recommend giving them additional tasks in English.

The feedback I've gotten from my students was great. They didn't have many problems with math and they loved using the Eyejack app.

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.

The Bonnot Gang - assessment

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SPEED	the students were the first in the class who reached the final solution	the students were the second or third in the class who reached the final solution	the students were not among the first three pairs who reached the solution
accuracy	all problems are solved correctly	ONE PROBLEM WAS NOT SOLVED CORRECTLY, BUT STUDENTS DID REACH THE FINAL SOLUTION	Two or three problems were not solved correctly, students did not reach the final solution
Detail of the work	there is a detailed procedure in all of the problems with clearly shown steps of solving. All clues are written.	In 1-2 problems there is no detailed procedure or there are no clearly shown steps of solving. 1-2 clues are missing.	In more than 2 problems there is no detailed procedure or there are no clearly shown steps of solving. More than 2 clues are missing.

ROOKIES: 3-4 points

SKILLED: 5-7 points

MASTERS: 8-9 points