Europeana Learning Scenario

Title

EarthQuest – Virtual Global Adventure

Author(s)

Ella Rakovac Bekeš

Abstract

Using Google Earth and Europeana resources students are taken on a virtual tour around the Earth. As they travel around the Globe they are discovering fun facts about various soft drinks like Coca Cola, well-known food products (ketchup) and food plants (cocoa and corn) throughout the history. To finish their quest, they need to solve a problem attached on each location. By completing all the stations and by solving all the math problems, they unlock the words in a word search puzzle. When the student solving the puzzle finds all the words, the hidden message will be revealed.

This is a learning scenario for remote teaching.

Keywords

Math, equations, food, STEM, Earth

Table of summary

Table of summary	
Subject	STEM, English, History, Geography, Biology
Topic	Science – food composition Biology – structure of plants, nutrition Math – Solving systems of linear equations Technology – using app for presenting and making virtual tours (Google Earth) English – past tense contrast, new vocabulary, writing a short story, skills round-up History – industrial revolution Geography – map application, finding places and orientating on the Globe by using app
Age of students	14 - 17
Preparation time	10’
Teaching time	60’ (+another 60’ for collaborative work project)
Online teaching material	Google Earth app (available for iOS and Android)

Co-financed by the Connecting Europe Facility of the European Union

	EarthQuest virtual tour in Google Earth (works on all mobile devices with app and on all web browsers, best on Chrome) YouTube video about Coca Cola history YouTube video how corn becomes cornflakes YouTube video about ketchup history Article about Petit Beurre biscuits and its history National Geographic article on how ketchup was invented Interactive self-assessment quiz with word search puzzle in Genially https://padlet.com/ used for collaboration
Offline teaching material	Worksheet for solving math problems Word search puzzle (optional)
Europeana resources used	Europeana exhibitions – Edible Plants from Americas Photo 1 - Chocolate Man lollipop Photo 2 – Coca Cola can Photo 3 – Coca Cola vintage Photo 4 – Petit Beurre box Photo 5 – Kellogg`s Cornflakes Photo 6 – vintage Kellogg`s Photo 7 – Tomato plant Photo 8 – Heinz ketchup bottle Photo 9 – Cacao pod on a tree Photo 10 – Chocolate Cake

Licenses

Integration into the curriculum

This learning scenario takes a cross-curricular approach.

In the national Math curriculum for the 1st grade (15-year-old students) there is an outcome “Applies proportionality, percentages, linear equations and systems”, by which students need to gain skills of mathematical modelling in math, from other fields and life. Also, to solve linear equations and systems of linear equations.

The learning scenario can be easily integrated in any English language lesson. In the national curriculum there is a unit for students to analyze a custom text in writing and also to listen with understanding - all this is supported in this scenario. One of the outcomes is to communicate in formal and non-formal situations therefore, it can fit into any type of English lessons.

The history curriculum contains a unit on industrial revolution, which covers the topic of key inventions and scientific discoveries as drivers of industrial revolutions and changes in daily life.

This lesson can be used for Biology covering a topic on various food plants and nutrition facts.

ICT has a unit on using new technologies and apps, and this scenario can fit perfectly into it with using Google Earth as a tool for creating stories and maps. Using geographical maps (thematic ones) combined with ICT is one of the most important outcomes in Geography.

Aim of the lesson

The aim of this interdisciplinary lesson is to practice math modelling real life problems, learn about cultural impact of various famous food products, gain new vocabulary in English and gain skills in using virtual 3D maps.

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

Outcome of the lesson

In the given problems, students will be able to recognize the possibility of solving a system of two linear equations with two unknowns. They will be able to transform the given text problem in the form of a system of linear equations and solve it. Also, they will be able to recreate similar math problems based on pictures.

Trends

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

Lifelong Learning - learning does not stop when teaching ends

Stem learning – the focus is on Mathematics and Science

Edutainment – playful learning, learning while having fun

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

Assessment - the focus of assessments is shifting from "what students know" to "what they can do"

21st century skills

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

Activities

Name of activity	Procedure	Time
Introduction	The teacher engages students in activities that will follow by posting a few questions in the virtual classroom. Do you know why Coca Cola has the word Coca in its name? Are the 24 "holes" in a Petit Beurre biscuits	2-3'

Name of activity	Procedure	Time
	accidentally there or do they have deeper meaning? Do you know who invented ketchup? What types of cocoa beans are used for chocolate? Have you ever visited a sanatorium where cornflakes are invented? After intriguing the students, they are provided with a link for a quest around the Globe to answer these questions.	
EarthQuest	Students get a math Worksheet which they individually need to fill visiting stations on a virtual tour around the Globe. Using Google Earth story they visit different places, read and watch fun facts about food products, drinks and food plants. On each station one math problem is given. They need to write it down and solve it.	40’
Word Search	In the last location of the tour, a link to an interactive quiz for self-evaluation is given. As students give the right solution a word appears. If their solution doesn`t make sense or it is not given, students will know they need to check their errors. At the end the words should be crossed out in an online word search puzzle (students can also print it out if it is more convenient for them). After crossing out all the words, a hidden message appears as a final solution. (“Enjoy little things in life”)	7-8’
New ideas	Students need to search Europeana resources, on topic used in their EarthQuest (food, plants etc.) They need to recreate their own math problem example, based on a chosen photo and post it to Padlet. Also by giving 1-5 stars they need to “vote” for the best examples as a form of peer evaluation.	10’
New Tour	This activity is intended as a “homework” project. Students collaborate in a group of 4-5. They need to use examples from the Padlet and do a research on given food, products or ingredients. After that, using all mentioned, create a digital story and a tour in Google Earth. All students from one class use the same tour by sharing the link and collaborating.	Optional 60’

Assessment

Formative assessment, self-evaluation. After solving all the math problems, for each problem a right solution is provided in an interactive presentation. If their solution doesn`t make sense, they need to check their errors.

Formative assessment, peer evaluation. Students need to evaluate work of their peers by giving 1-5 stars for examples posted in Padlet.

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 biggest surprise for me was the fact that students weren`t familiar with the Google Earth app. They were thrilled with it, and with the possibilities it gave them for presenting a story. But I had to separate a little more time than initially planned due to tutoring students on making their own virtual tour and how to collaborate on it. Regarding this EarthQuest lesson they gave only positive comments and feedback. They were really surprised by the hidden agenda behind the Petit Beurre biscuits. The students' satisfaction with this lesson came from successful combining interesting facts from everyday life with math merged into virtual tour around the Globe. As they pointed out, it is easier to do math when it is about ketchup and Coca Cola and somewhere far far away.

As for recreating math problems in Padlet, students requested to post this in Croatian. Before adding it to the virtual tour they will contact their English teacher in order to successfully translate it.

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.

Annex