

Digital Mapping Study of a School Environment

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Subject: Natural Sciences.

Country of creation: Ireland.

Countries of testing: Slovenia, Portugal.



Aims of the GP

The overall aim of the project is the development of innovative teaching methods and tools which demonstrate best practice models using the local environments as outdoor laboratories for the teaching and learning of Environmental Science.

Necessary Teaching Material

GPS

Laptop

Projector

Interactive White Board

Big screen

Spreadsheet.

Age of the students

12-13

Preparation and teaching time

1st period (classroom): 30 min.

2nd period (outdoors): 60 min, field trip.

3rd period (classroom): 60 min.

Lesson plan

Activity 1. Hands-on equipment

The equipment: Innate and already acquired skills driven by the everyday use of mobile phones, iPhones, iPods, Xboxes and satnavs are harnessed for familiarity with the GPS device. This human-computer interfacing (HCI) initiates lesson one.

Hardware: Explore the HCI and familiarize with it: alphanumeric keyboard, routes, waypoints on routes, electronic inbuilt compass. Experiment also with the FIND facility.

Software: Explore the accompanying software which has a vast menu of icons for placements on any type of natural or manmade landmark.

Explore the free Google maps and familiarize with the intuitive process of uploading.

Activity 2. Hands-on operations

Operations of Increasing Rigour:

Location 1. The school environs: Identify five waypoints - school entrance, car-park, bus stop, football field and basketball court. Walk to these waypoints, stop and use the keypad to text in the name of each waypoint as you pass by. Data is now captured.

Location 2. School bus route: Switch on the GPS as the bus leaves school. Bus stops ten times en route to drop off pupils. At each stop enter pupil's drop off location as waypoint. Data is captured. This brings the project from the school to the home.

Location 3. A trip to local village. Select 15 waypoints: post office, shop, church, café, community centre, tourist office, cinema, youth club, bridge, cemetery, sports ground, monument, police station, village school, factory. Capture data as in the two previous instances.

Questionnaire

There are 360 degrees in a

Triangle / Semi-Circle / Quadrant /
Circle

The Tropic of Capricorn lies

On the Equator.

23.5 degrees south of the Equator.

60 degrees north of the Equator.

70.5 degrees south of the Equator.

Lines of latitude are

Parallel / Vertical / Diagonal /
Convergent

GPS is an abbreviation for

Greek Positional System.

General Postal Services.

Global Positioning System.

Great Players of Slovenia.

Altitude is a measurement for

Height / Depth / Length / Weight

The number 60 used in the measurement of Time and Angles is a/an

Odd number

Perfect number

Triangular number

Even number

Speed x time =

Distance / Capacity / Weight /
Inertia

A compass has the following number of Cardinal Points

7 / 8 / 4 / 32

Cartography is the science of

Financial dealing.

Map and chart drawing.

Solving Pythagoras' Theorem.

Farming.

One can calculate the length of a route by which of the following methods

Time x speed per hour.

Speed per hour / time.

Time + speed per hour.

(Time + speed) squared.

A protractor is used for

Measurement of angles in degrees.

Extracting cooking fumes in a kitchen.

Repairing tractors on farms.

Construction by building contractors.

The mountain peak with the highest altitude in Western Europe lies in which mountain range

The Pyrenees.

The Carpathians.

The Alps.

The Apennines.

The average altitude for 4 mountain peaks is 1225 meters. The total for the 4 peaks is

8002 meters / 7798 meters / **4900 meters** / 5001 meters

A time of 210 minutes is equal to

3 hours / 2.75 hours / **3.5 hours** / 3 hours and 29 minutes

Which measurement is nearest to 3951 meters?

4 km

3.999 km

3500 m + 450 m

3.629 km

A hydro dam is

1. A natural feature in the landscape

2. **A manmade construction**

3. The result of glaciation

4. Powered by coal.

06:00 hours on the clock in Brussels is

1. **Midnight in New York City**

2. Midnight in London

3. Midnight in Chicago

4. 00:05 hours in Ljubljana

A route of 180 km travelled at 50 km/h takes

1. 4 hours.

2. 5 hours

3. **3 hrs. 30 minutes**

4. 2.75 hours

Contour lines link locations of

1. **Equal Altitude.**

2. Equal Longitude

3. Equal Latitude

4. Capital cities on the same Latitude.

How long does a route of 90 km travelled at 60km/h take

1. 2 hours

2. 135 minutes

3. 1.75 hours

4. **90 minutes**

Teacher reviews

The teachers who implemented this GP generally gave good feedback; the biggest challenge in this GP is having enough GPS available for the students to be able to do their measurements, but once the equipment is available, the GP raises the interest of all the students.

A GPS, being a tool that most parents of students have in their cars nowadays, is commonly known for giving directions on how to get from point A to point B in the quickest way possible. However, few students would think that a GPS could be used as a didactic tool at school. For this reason, since the students could relate to the GPS as a tool that is used in their surroundings in everyday life, their motivation in being able to use this tool at school and to make calculations with it themselves was clearly higher.

The SPICE project

SPICE was a two-year project (December 2009 – November 2011) carried out by **European Schoolnet** (<http://europeanschoonet.org>) together with **Direção Geral de Inovação e Desenvolvimento Curricular** (<http://sitio.dgicd.min-edu.pt/Paginas/default.aspx>) from Portugal and **Dum Zahranicnich Sluzeb MSMT** (<http://www.dzs.cz/>) from the Czech Republic.

The primary objective of the SPICE project was to collect, analyse, validate and share innovative pedagogical practices, particularly those using inquiry-based learning, whilst enhancing pupils' interest in the sciences. SPICE supported this objective by singling out, analysing and validating good practice pedagogies and practices in maths, science and technology (mostly ICT-based) and disseminating them across Europe. SPICE involved 24 teachers from 16 different educational systems (from 15 different countries). This teachers' panel helped the SPICE partners in defining good practices that were then tested in classes by 41 teachers during the school year 2010-2011.

For more information see: <http://spice.eun.org>



Lifelong Learning Programme



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