STUDY KIT FRAMEWORK

Title: Hudournik
Topic: field work with students
Key words: observing, orientation, tectonic fault, cell phone applications
Subject: geography, biology
Cross-curricular Topic: climate and biodiversity on the Vojsko plateau
Level: Medium
Age: 15-18
Number of students: 5-15
Duration in minutes: 70-90
Place (classroom, outdoor etc.): Outdoor
Author: Ester Mrak
School: Jurij Vega Grammar School Idrija
Language: English, Slovenian

Overview: Practical work in the field of geography and biology where participants learn about how various natural elements are interconnected.

Objectives:
Participants will

- learn by doing,
- explore an important geological site,
- use simple cell phone applications,
- observe the relief above the Idrijca, the Kanomljica and the Hotenja rivers,
- understand the connection between endogenic and exogenous forces and relief shapes in the region,
- explain the connection between relief shapes and…
  - population density in the region,
  - vegetation,
  - river's network
- name several plants, growing on the Vojsko plateau,
- analyze the connection between altitude and vegetation.

Learning material and tools:
Working sheet, cell phone, maps, text, vegetation book

Preparation:
Activity participants should

- download the required applications on their cell phones,
- read the geological text about the Idrija fault,
- understand the basic geological & geographical terms such as *geological time scale, fault, tectonic plates, relief, limestone.*

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Evaluation: Participants make a terminological dictionary, containing new terms from the fields of geography and biology. The teacher checks that the participants have fully understood the topic.

Extra material:
Working sheet, cell phone applications: a compass, an altimeter and WIKILOC, maps (Idrija 1:50.000), a geological map (Tolmin sector), the geological text about the Idrija fault, a geological time scale, …

Detailed description/instructions:

HUDOURNIK-VOJSKO

1) Determine the latitude and longitude of the point where you are standing! Use GPS.

_____

The altitude of the Hudournik peak is_____

Observe the landscape around you and write down what the connections between the altitude, the latitude and the landscape are (relief, vegetation, agriculture orientation).

_____

_____

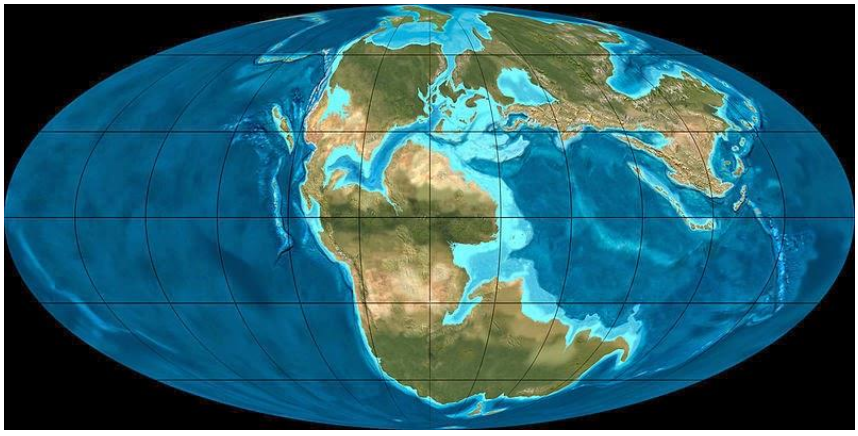
_____

_____

_____

2) Which rocks build the surface? Use the geological map. _____
In what kind of environment were these rocks created? _____

_____



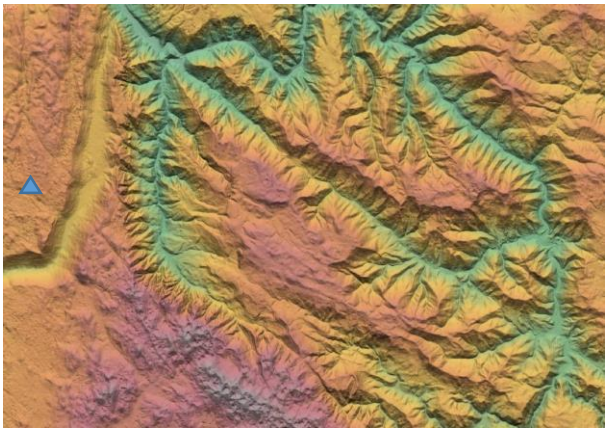
Jurassic Period

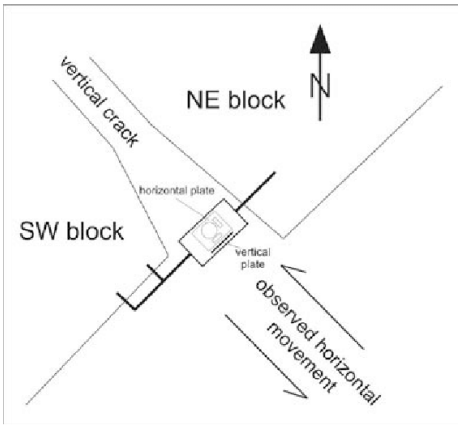
This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Despite the permeability of rocks, there are not many karst phenomena. Why?

_____

3) The Idrija fault; observe the region and try to find the line of the Idrija fault. Draw it on the map.





Name the rivers on the map:

_____

Describe your understanding of the term *fault?*

_____

_____

_____

The sketch of TM 71 installation on the crack in the Idrija fault zone with indication of observed displacement.

4) What landforms can you name?

_____

_____

_____

Which endogenic force is important? _____

What are the geomorphic processes that are involved in shaping the landscape? _____

_____

How are different elements in the given landscape connected by processes? _____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

_____

What has the human impact on the landscape been? _____
_____

Can you understand how human and physical processes interact in the landscape? _____
_____

How does the landscape make you feel? _____

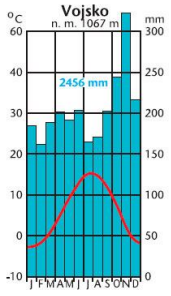
5) Think about sustainable development. How can the landscape in this area be preserved?
_____
_____

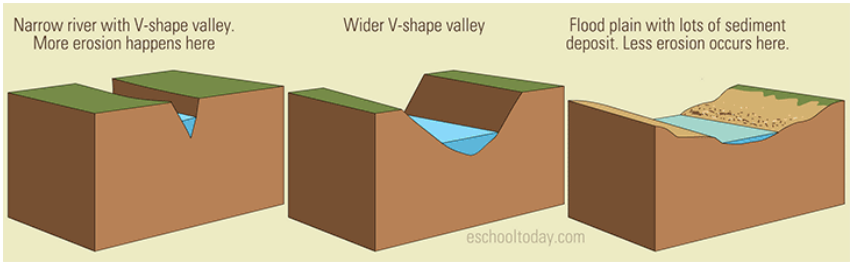
6) Vegetation in Vojsko; name at least three tree species: _____
_____ and _____. Why is moose common on the plateau? _____

Would you say that the forest is bright or dark in the lower layers? Why? _____
_____

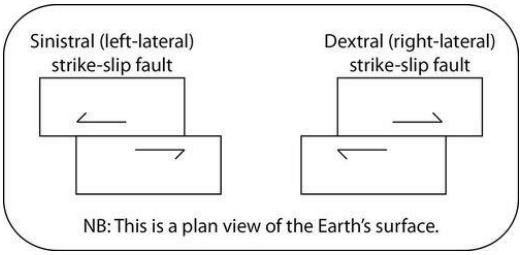
Working material:

http://www.eschooltoday.com/





Idrija fault: https://en.wikipedia.org/wiki/Idrija_Fault
The Idrija Fault, Slovene: Idrijski prelom) is a seismically active fault in Slovenia. It strikes NW–SE and the fault plane dips towards the northeast. The activity along the fault started in the Miocene with normal faulting and changed to dextral strike-slip in Pliocene. The fault was first described by Marko Vincenc Lipold, a geologist from Slovenia.



Present displacement is measured and varies along strike but is in the order of magnitude of 0.1 mm per year. [The strongest earthquake along the Idrija Fault was the 1511 Western Slovenia earthquake (or 1511 Idrija earthquake), which took place on 26 March 1511, had a magnitude of 6.8, and caused about 12,000 deaths.

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

STUDY KIT FRAMEWORK

Title: PLEČNIK'S LJUBLJANA
Topic: field work with students
Key words: observing, orientation, cell phone applications
Subject: geography, history, art
Cross-curricular Topic: Getting to know Ljubljana with the emphasis on the architecture of Jože Plečnik
Level: Medium
Age: 15-18
Number of participants: 5-15
Duration in minutes: 150 min
Place (classroom, outdoor etc.): Outdoor
Author: Nataša Graovac
School: Jurij Vega Grammar School Idrija
Language: English, Slovenian

Overview:

Researching Ljubljana on foot and getting to know more about the history and art of Ljubljana but also Slovene history with the emphasis on the architecture of Jože Plečnik.

Objectives:

Participants will

- be active and will learn by doing,
- learn how to use wikiloc and record the track
- explore different sites in Ljubljana
- observe the town, its architecture, nature and people
- understand the position Ljubljana and Slovenia had and has in the European history

Learning material and tools:

Working sheet, cell phone, google maps, texts, info signs

Preparation:

Activity participants should

- download the required applications on their cell phones

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Evaluation: The teacher checks that the participants have fully understood the topic.
Extra material: Working sheet, pens, cell phone applications: WIKILOC

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Detailed description/instruction:

PLEČNIK´S LJUBLJANA

Along the way you will design our route in Wikiloc. For that purpose, take pictures at the points defined in the working sheets and write their names.

*The famous Slovenian **architect Jože Plečnik** (1872-1957) left a lasting mark on three central European cities: Vienna, Prague and Ljubljana. After the 1st World War he accepted the post of professor at the newly established University of Ljubljana and focused all his creative energies to designing the nation's new capital. Plečnik tried to use modern approaches. His style, innovative even by today's standards, is characterized by the use of classical architectural elements, such as pillars, balustrades and colonnettes, redesigned and combined in the master architect's own special way.*

The so called ˝Plečnik's Ljubljana˝, a unique example of urban planning, is considered to be one of the 20th century's most important total works of art. Today, we hope, you will take a peek on that part of our cultural heritage.

1. **WAYPOINT**

We start our tour in Plečnik´s house in Trnovo.

Write some of your impressions about the site:

_____

_____

_____

_____

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

2. **WAYPOINT**

From Karunova street you proceed over the Trnovo bridge (btw. made by Plečnik, remember some details, since you will find similarities later on another bridge over Ljubljanica), turn right and proceed along the park (Gradaška street) (about 250 m) to Krakovski nasip (dam), where you turn left and continue to Zoisova cesta (250 m).

Turn left and after about 200m go right on Emonska cesta and Trg francoske revolucije.

3. **WAYPOINT**

On you right you will notice a big complex **KRIŽANKE** (named after the medieval Order of Teutonic knights – Slovenian križniki).

Take a peek inside the yard. Get some photos and find more info in this page:

https://www.visitljubljana.com/en/visitors/things-to-do/sightseeing/krizanke-summer-theatre/

What is going on inside Križanke today?

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

4. **WAYPOINT**

From Trg francoske revolucije you proceed on Vegova ulica about 100m and on your right you will notice a big red-orange brick building.

What is inside?

_____

Find some interesting symbolic about some details on its exterior (door handles) and interior on the following website:

https://www.visitljubljana.com/en/visitors/things-to-do/sightseeing/national-and-university-library/

5. **WAYPOINT**

Proceeded along Turjaška ulica (you have the main entrance to the orange building on your right) to Novi trg, until you reach the Ljubljanica river.

6. **WAYPOINT**

Turn left and cross the river over the **ČEVLJARSKI MOST** (Cobbler´s bridge). In the Middle ages this bridge was also a place where local authorities punished bakers that cheated on bread weight. They (bakers, not local authorities) were immersed into Ljubljanica.

Find out which profession was the first that had its workshops on the bridge and why they have to move away on:
https://en.wikipedia.org/wiki/Cobblers%27_Bridge

Profession: _____

7. **WAYPOINT**

Now you are in the place called **POD TRANČO.** In late Middle ages and early Modern period town prison was there. **Find out more about this part of the city from short description on one of the buildings.**

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

8. **WAYPOINT**

At the end of this very short street turn left to **MESTNI TRG**. This is one of the oldest parts and meeting points of medieval Ljubljana. As you can see on both sides of the square there are beautiful old buildings (with baroque facades). Are you curious why medieval buildings have baroque facades? The most important of them is the Town hall. In front of it there is one of the most famous baroque pieces in Slovenia: a fountain. **Find its name and more info on the following site:**
https://www.visitljubljana.com/en/visitors/things-to-do/sightseeing/mestni-trg-square/

Where is the original kept?_____

The photo above was taken in some other period in time. Could you define the period? What are your arguments for that?

_____

_____

_____

On the photo there is a means of transport that Ljubljana today doesn´t have any more.

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

What´s its name? _____

9. **WAYPOINT**

At the Robba´s fountain turn left and go on untill you reach the river.

In front of you there is the **Tripple bridge** and **Prešeren´s Square and monument** on the other side of the river. You will have time to explore this part of the city later on.

10. **WAYPOINT**
Now turn right. You are walking along **PLEČNIK´S COVERED MARKET**.
Try to point out some of the details, that are characteristic for this architect.

_____

_____

_____

_____

11. **WAYPOINT**

From Pogačar´s square you can see a church. **Write its name**. A hint: his saint feast day is on December 6th. ;)) _____

The church (**Ljubljana´s Cathedral**) is mainly build in baroque style. **Try to get inside and find out more about its interior on:**
https://www.visitljubljana.com/en/visitors/things-to-do/sightseeing/the-cathedral-church-of-st-nicholas/

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Take a closer look at the main door. It depicts the Slovene national history. Write down the events or people you recognise.

_____

_____

_____

12. **WAYPOINT**

From the church you can go back to the market and find out what you can buy there or you can proceed along the main entrance to Ciril-Metodov trg. This square is the end of medieval Ljubljana and also the end of your exploring tour.

You made it. Don't forget to finish the wikiloc track and upload it.

We hope you have enjoyed the self-guided tour of Ljubljana. ☺

Since it is time for lunch and you must be hungry, find a place called **Gostilna Dela**. It is situated on Poljanska 7, abbot 300m from the Cathedral. We chose this place because of its emphasis on inclusion of vulnerable groups of young and disabled people that have the opportunity to receive their training under the mentorship of experienced chefs.

Dober tek! Enjoy your meal!

Some important Slovene words

cesta– street most – bridge

trg – square nasip – dam

tromostovje - tripple bridge cerkev – church, stolnica – cathedral

tržnica – market

left - levo right – desno straight on – naravnost

thanks – hvala please - prosim

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

STUDY KIT FRAMEWORK

Title: KAMŠT, RAKE, WILD LAKE
Topic: field work with students
Key words: observing, orientation, wikiloc
Subject: geography, biology, chemistry, physics, history
Cross-curricular Topic: Trail of Idrija´s Natural Scientists and Unesco technical heritage
Level: Medium
Age: 15-18
Number of students: 5-15
Duration in minutes: 180
Place (classroom, outdoor etc.): Outdoor
Author: Ester Mrak, Marjanca Poljanšek, Magda Klasinc, Branko Kalan, Irena Česnik Vončina
School: Jurij Vega Grammar School Idrija
Language: English, Slovenian

Overview: Learning in nature the topics from geography, chemistry, physics, history and biology.
Participants discover the Idrija´s Natural Scientists and Unesco technical heritage and learn how various natural elements are interconnected.

Objectives:

Participants will

- be active in nature and learn by doing,
- use wikiloc,
- explore the trail of Idrija's Natural Scientists,
- understand the operation of the water wheel,
- observe bunkers,
- name several plants growing in Botanical Garden and along the path,
- learn to recognise and define some rocks,
- understand the connection between rocks and relief,
- conduct a chemical analysis of the water using a field suitcase.

Learning material and tools:
Working sheet, cell phones with wikiloc, maps, text, vegetation book, suitcase for analysis of water

Preparation:

The teachers will prepare a working sheet with questions about the places being visited.
Participants will install wikiloc on their smartphones and follow the path Rake and complete the worksheet.

Evaluation:

Participants write the answers to the worksheet during the trail.
The teachers check that the participants have fully understood the topic.

This publication was supported by the Erasmus+ Programme of the European Commission.

Detailed description/instruction:

1. KAMŠT

The mine pumping device is famous for its water-driven wooden wheel with a diameter of 13.6 meters. It is the largest preserved device of this kind in Europe.

1. When was 'kamšt' built and why?

_____

2. How much water per minute did the pump pump? _____

_____

2. BOTANICAL GARDEN

The botanical garden is located on the edge of the town, at the entrance to the Zgornja Idrijca Landscape Park. It was established in 2004 and has been developing ever since.

1. You're standing in front of the botanical garden. Who is it named after?
   What can you find in the botanical garden?

_____

_____

_____

2. Chronologically list the important natural scientists who worked in Idrija and were also famous in Europe. (You might find the facts on the board next to the garden helpful.)

_____

_____

_____

3. There are many plant species in the garden. Choose three, take photographs of these plants and copy their Latin and Slovenian names. Define where they grow.

_____

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

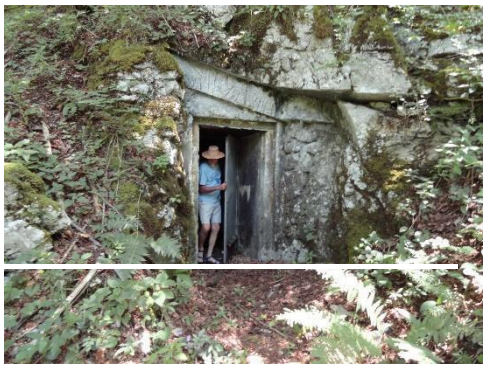
3. RAKE CHANNEL

The first Rake water channel, which directed water from the dammed Idrijca river at Kobila to the centre of the town, was built in 1595. The power of the water fuelled numerous mining devices: saws; pumping, lifting, crushing and irrigating devices, heavy forging hammers and mills.

The Rake channel was originally made of wood and it was only constructed in brick and stone 170 years later. When the 'kamšt' was built, the water channel shortened and no longer led to the centre of the town.

The path runs continuously alongside the water, in the shades of trees and next to the lower level of the Idrijca river. It leads us past giant trees, the river curve at Zagod, a spring, multiple footbridges over the Idrijca river and it ends at the Kobila dam.

4. BUNKERS



1. Who built these bunkers?

_____

_____

_____

_____

2. When were they built?

_____

3. Why were they built?

_____

_____

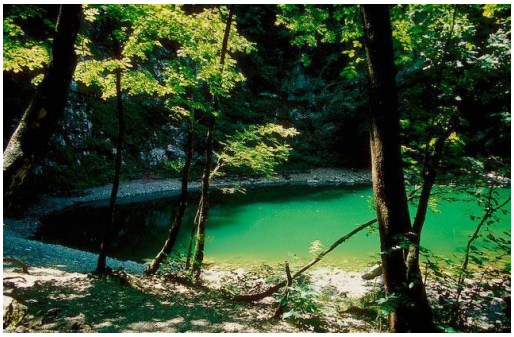
4. Explain why they were built in this location.

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

5. THE WILDE LAKE



The lake Divje jezero (Wilde Lake) is a natural phenomenon almost like no other in the Slovenian territory. It is a typical karst spring into which waters flow underneath almost completely upright walls rising steeply above the lake and forming a kettle-like shape.

The lake and its immediate vicinity boast with immensely rich fauna and flora. It has been proven that around 150 types of Pteridophyta and seed plants grow in the nearby areas of the lake. This immense diversity is due to ecological diversity of the site and the geographical position of the lake (Wraber: Idrijski razgledi 29/31, 1986).

In rock cracks or on small ledges above the lake you can spot the Carniolan primrose - Primula Carniolica, a Slovenian endemic plant. The living conditions give a chance for many, even Alpine, plant species to grow here. These are the remains of Ice Age flora.

1. Find some of the plants that grow in this area and write down their names.

(You might find the facts on the board next to the lake helpful.)

_____

_____

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Here two practical tasks are carried out: one in the field of chemistry and the other one in the field of geology.

GEOLOGY AT THE WILDE LAKE, IDRIJA

Fieldwork objectives: Students learn to recognise some rocks which build the area of the upper Idrijca river and can be found in the deposit sediment near the river. They can read geological maps, describe rock characteristics and connect them to the relief. They learn about what a geologist does. They are aware of the diversity of the geological structure in our surroundings.

What we need: a worksheet, maps – the map of the Idrija Municipality, geological map of the area, a mobile phone with apps (a compass, GPS, an altimeter, a camera), pens, magnifying glass, 10% HCl, a geological hammer, some glass for scratching.

1.Describe the position of the Wilde Lake.

Coordinates; _____

Orientation, azimuth, points of fracture above the lake _____ from the point where you are standing.

Altitude: _____

2. Draw a sketch of the fracture above the lake and describe the characteristics of the fracture.

3. Use the map to help you describe geological characteristics around the Wilde Lake.

4. Gather several rock samples (at least 15). The geologist will help you choose the most interesting ones. Describe them in the table below. Take photographs of the 5 chosen rock

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

samples.

	Rock 1	*Rock 2*	*Rock 3*	*Rock 4*	*Rock 5*	
Date and place of sampling the rock						
Name of the rock						
Hardness						
Structure						
Carbonate content						
Rock colour						
Classification of the rock by origin						
Does the rock scratch the glass? If it does, what does that indicate?						
Other features, e.g. Is the rock useful for us?						

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

CHEMICAL WATER ANALYSIS WORKSHEET

Place of sampling: 1)_____ 2)_____

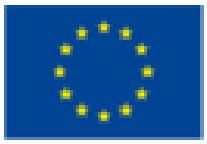
		Water sample 1	Water sample 2
	Sampling place description **Parameter (unit)**		
Organoleptic properties	COLOUR		
	BRIGHTNESS		
	ODOUR		
Hardness of water	CARBONATE HARDNESS (°d)		
	TOTAL HARDNESS (°d)		
Nitrogen compounds	AMMONIUM (NH_4^+) (mg/L NH_4^+)		
	NITRATE(V) (NO_3^-) (mg/L NO_3^-)		
	NITRITE(III)(NO_2^-) (mg/L NO_2^-)		
Phosphorus compounds	PHOSPHATE(V) (PO_4^{3-}) (mg/L PO_4^{3-})		
Acidity	pH value		
	TEMPERATURE (°C)		

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.

Physical properties	TIME (h)		

Interpret the results:

This publication was supported by the Erasmus+ Programme of the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained herein.


Erasmus+

_____

_____

This publication was supported by the Erasmus+ Programme of the European Commission.