Education and Culture DG
Lifelong Learning Programme

OSNOVNA ŠKOLA PUČIŠĆA

AGENCIJA ZA MOBILNOST I PROGRAME EU

COMENIUS

MULTILATERAL SCHOOL PARTNERSHIPS / MULTILATERALNO ŠKOLSKO PARTNERSTVO

Crosscurricular teaching – TEACHERS' EXAMPLES OF GOOD PRACTICE

/

Kroskurikularno poučavanje – PRIMJERI UČITELJSKE DOBRE PRAKSE

Results of the project: ***Cross-curricular teaching on cultural and natural heritage topics***

/

Rezultati rada na projektu: ***Kroskurikularno poučavanje na temama kulturne i prirodne baštine***

2013 – 2015

Pučišća elementary school / Osnovna škola Pučišća

THE WATER
5th GRADE

CROSS-CURRICULAR TEACHING
(REGULAR PROGRAM)

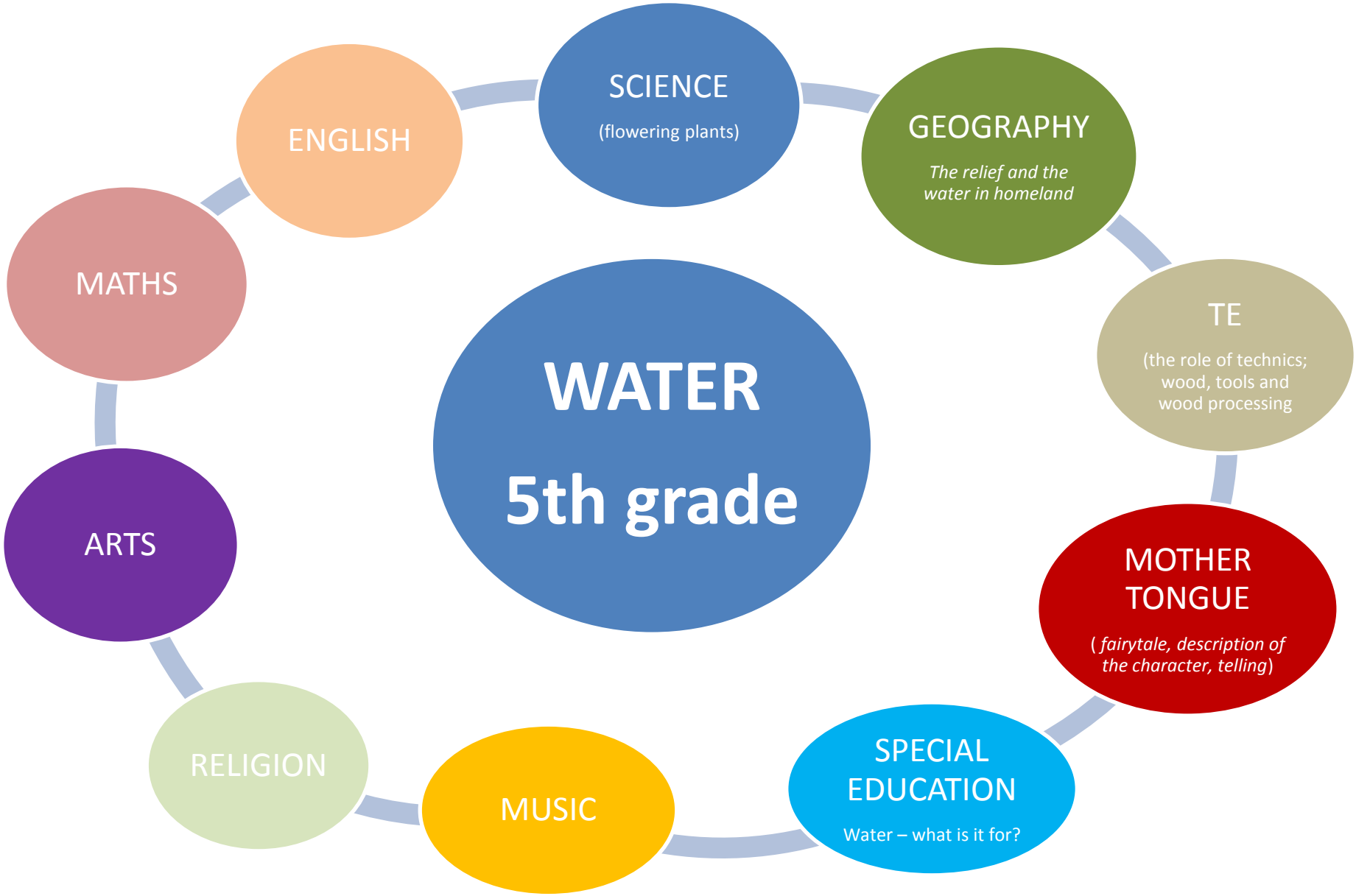
OBJECTIVES

- Better understanding of educational contents due to concentrated (integrated) approach and multi-aspect view
- To connect teaching with life (applying academic knowledge in everyday life, solving the problems creatively)
- To increase students' motivation for learning
- To develop students' competencies (communication, competence for learning and problem solving, social and work competence)
- Permanent students' knowledge in different teaching areas

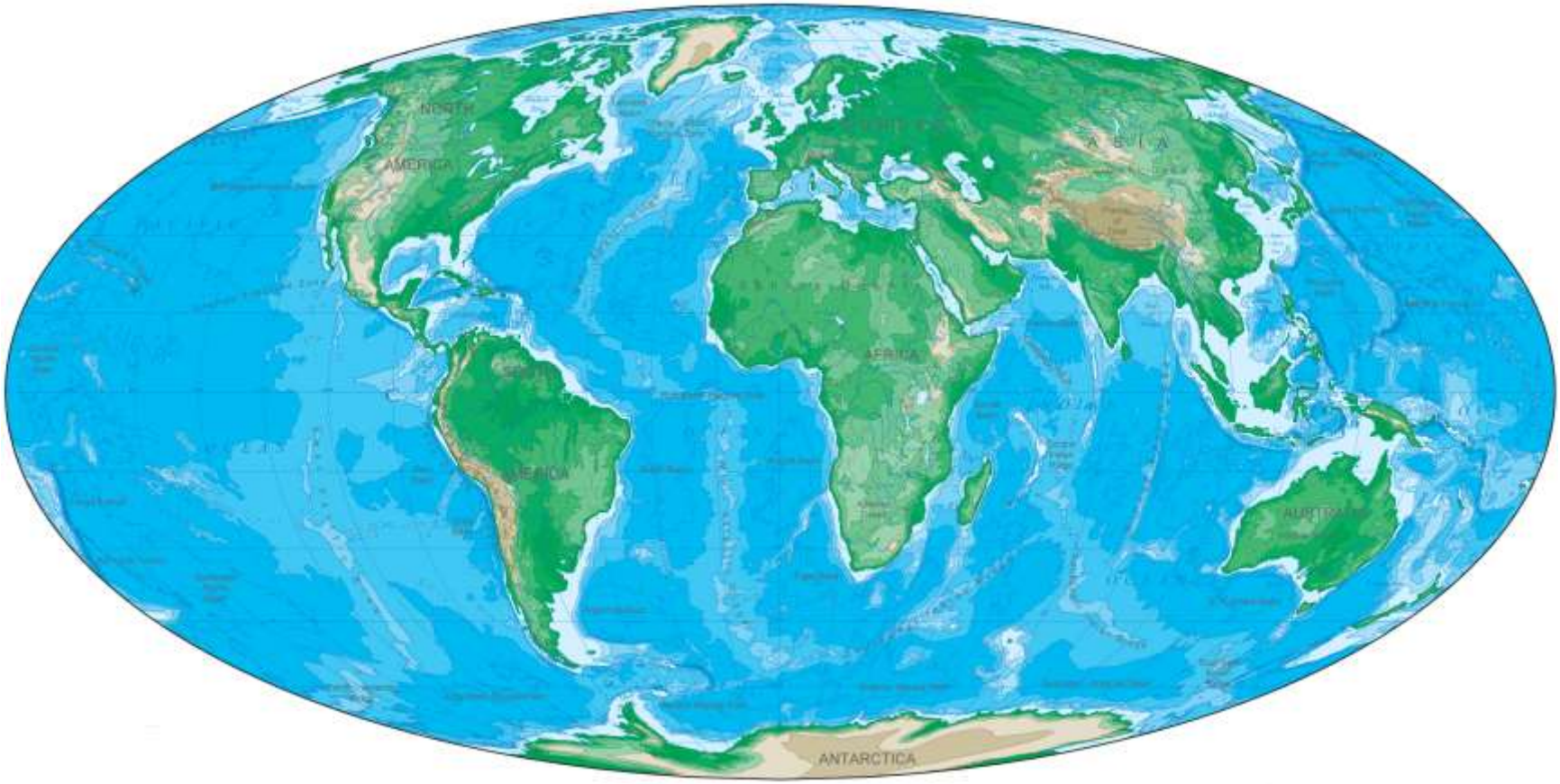
TEACHING METHODOLOGY

- Acquiring basic knowledge related to the topic in each educational field
- Researching topics in the immediate reality
- Researching information from the literature
- Information processing
- Pupils' creativity
- Analysing and explaining the results

Connected teaching areas (cross-curricular)



GEOGRAPHY



Outcomes:

- Understanding and explaining the constant change of the relief (examples from the homeland)
- Introducing karst relief forms in the homeland: field, sinkholes, karren, pits, caves, speleothems)
- Understanding and explaining the effect of water on karst relief and the impact of the karst relief on the water system on the island of Brač
- Creative solving environmental problems in the homeland: sustainable water management and water supply

DIDACTIC SCENARIO

1. Introductory repetition

What is relief?

(All planes and bumps on Earth's surface.)

RELIEF FORMS IN THE KARST

RELIEF AND WATER

- Heuristic conversation about the relationship between relief and the water (*the effect of the water on the relief, the effect of the relief on water circulation in certain area*).

- What happens to the water in karst relief?

The relief of the island Brač

Students study the relief forms (hills, valleys), discussing the circulation of rainwater. They express their experience and assumptions.

PUDDLES ON BRAČ

- „The whole island is a huge drain area. Due to karst permeability, the water goes underground and flows through the karst fissures. On the other hand, flash floods wash away unprotected ground and vanish in the sea. Subterranean water is kept and rises to the surface in lower levels. It also fills the puddles which have always been wells used by animals. Puddles wrapped by drywalls are especially beautiful in the island's scenery.”

(*Drystone constructions of Brač*, published by OŠ Pučišća)

SUPETARSKE TROLOKVE

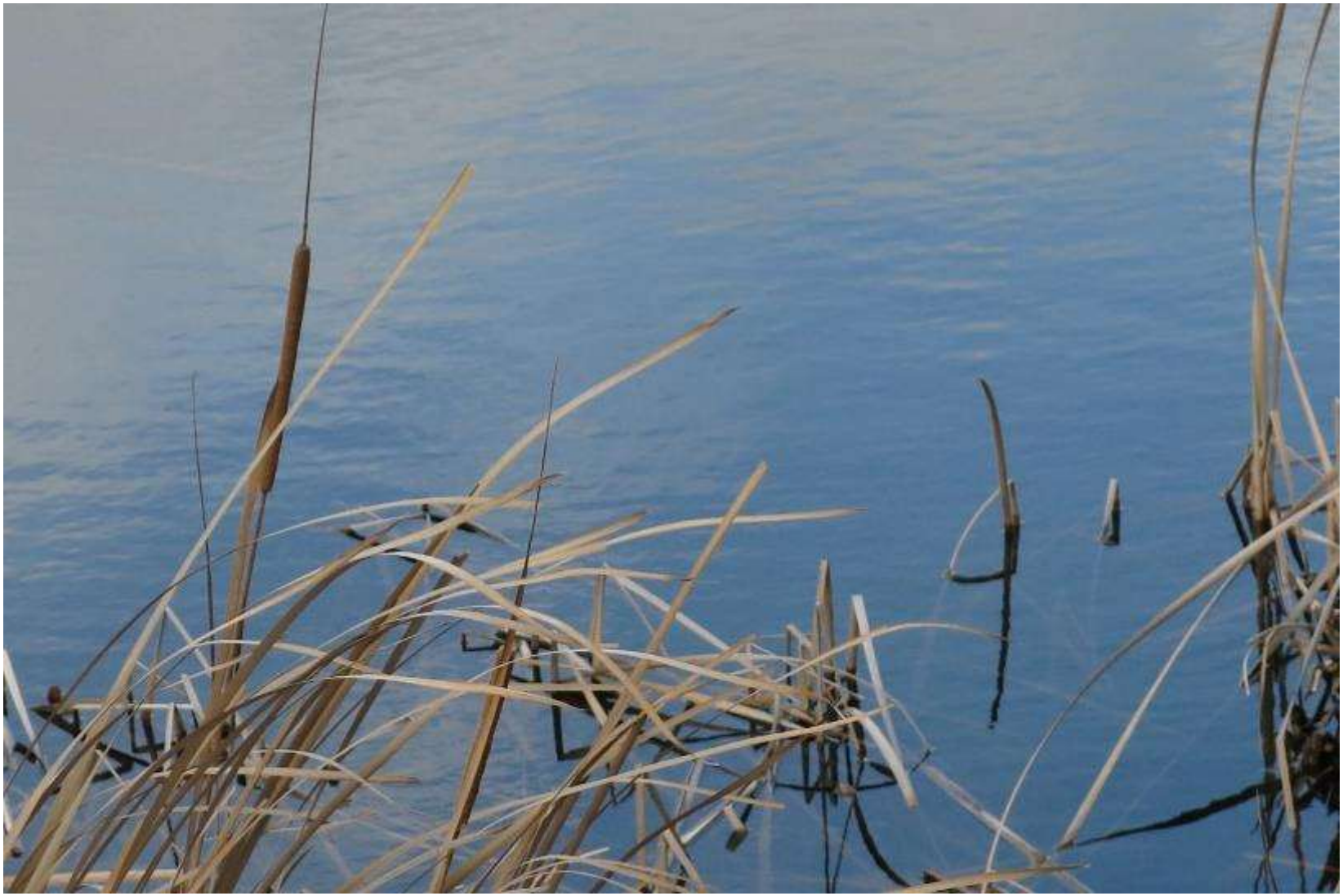
VIDOVA GORA

ŠĆIPON DOLAC

GLOGOVICA

DUBROVE

PRIHODE - MIRCA



DUČAC

LOKVE (sv Mihovil)

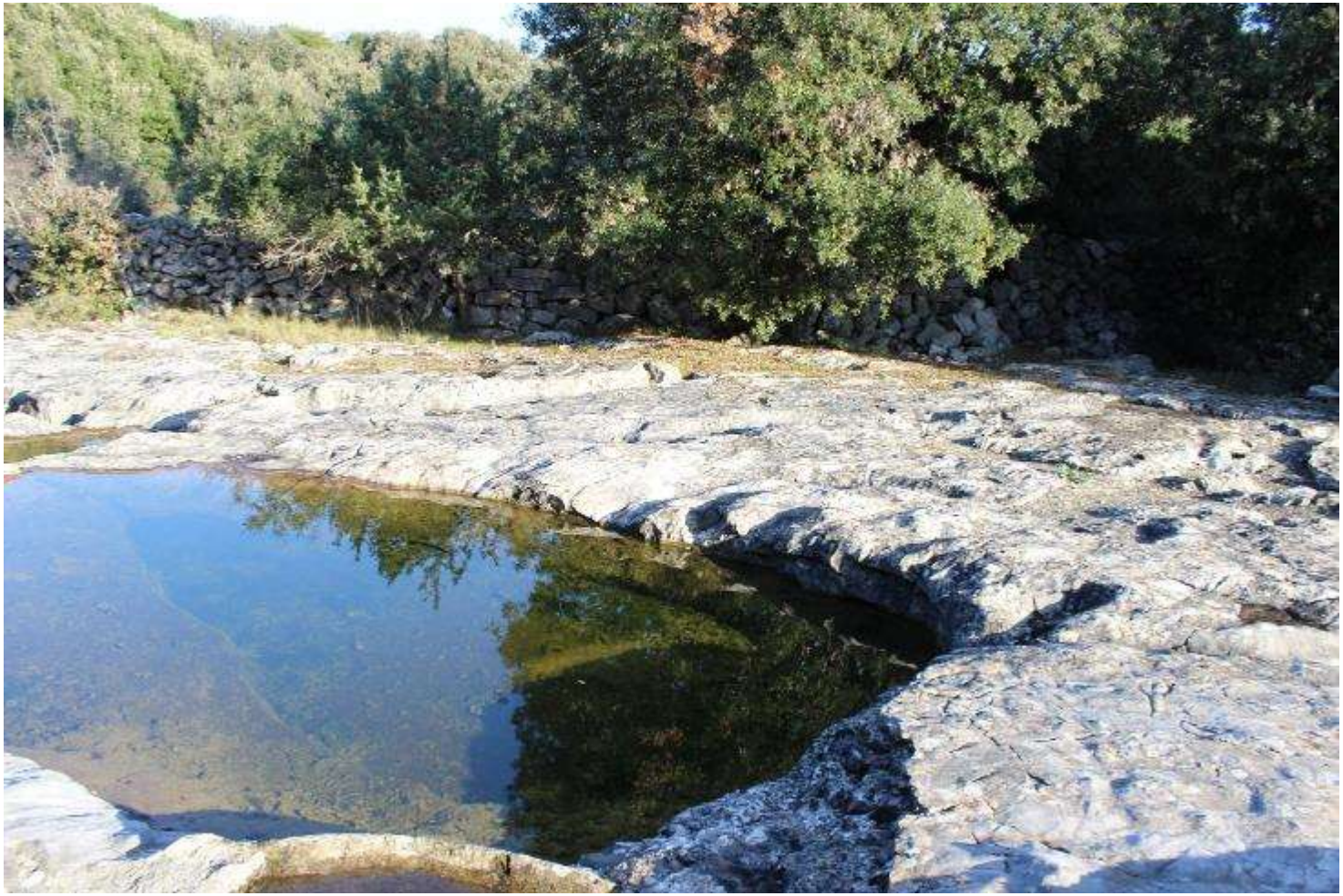
TROLOKVE – Vidova gora

Lokva Crni rot - Pučišća

Vrnica

Water collector (piover) on Vrnica puddle

Korita – Gornji Humac



Final activities

PROBLEM QUESTIONS:

- What is the surface water system on Brač composed of? (ponds, storage tanks, water tanks)
- How was the water managed in the past, and how is it managed today? Why?
- What is the condition of the Brač water today?

CREATIVE TASKS

- Suggest the way of improving water management on Brač
- Select one of the puddles displayed, suggest the way to arrange it.... (show the solution by drawings, sketches, photo editing and art amendments ...); explain the sustainability of your solutions

Students' creative works

SCIENCE

Flowering plants and water

TOPIC: Flowering plants and water

OUTCOMES:

- to recognize the main features of flowering plants (seed plants), their organs and functions
- to connect the plants and living conditions in their habitat
- to apply this knowledge in everyday life (making conclusions about the amount of water the plant needs based on the structure of the leafs; to determine which plants grow best in the karst enviroment)

The task for CREATIVE WORK after processing the information:

a) create your own garden, which will be blooming / green during the yearlong cycle - show the creation by drawing or painting

b) Make a model of self-sustainable garden

Data collection in the field study

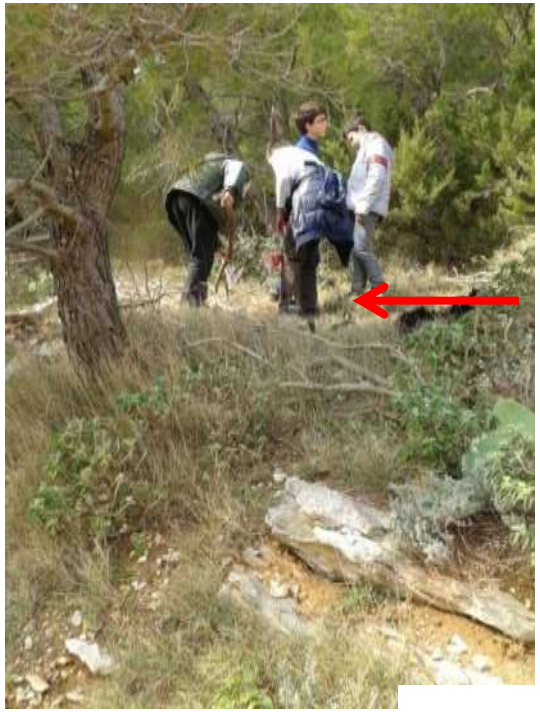
- to observe types of plants that grow in the environment - trees, bushes, undergrowth and herbaceous plants

- to observe the structure of plants that grow in the area - the root, stem, leaf, flower, fruit - dependence on water

- to observe the type of soil on which some plantsgrow

- to observe the place of growth of certain plant - shady and damp, sunny spot, more soil, stones rich soil, growing on a slope, growing in the valley ...)

- to collect material for making the garden in the classroom



Choosing a place to collect soil

Soil type - black soil

Using the tools that are found in nature

Processing of information (classroom work)

Students classify and analyze the data collected (plant material and notes) according to the criteria:

- Types of plants - trees, shrubs, semi-shrub, herbaceous plants
- Structure of the plant - root, leaf, flower, fruit
- The place of growth - shady and humid place, sunny spot, more soil, soil rich in stones, growing on a slope, the growth in the valley ...)

Students make a conclusion about what types of plants grow in certain habitats and about the amount of water necessary for their growth and development.

Work in the classroom

The task for creative work:

Imagine your dream garden. The garden in which will be greenery and flowers throughout the year. What plants will grow in it? In which place?

Make a sketch of the garden.

Incentive questions:

By what criteria you selected plants?

What do plants need to grow successfully?

How would your garden be directed?

Make a calendar of flowering of your chosen plants!

Arrange the plants so that the flowers reach the greatest expression.

How would you irrigatethe garden during the driest period?

- Choosing plants that are resistant to karst conditions for the garden
- Studying and writing flowering period (literature and Internet)

DRVEĆE
Bajama
Murva
Planika
Trešnja
Masline
Oskoruša

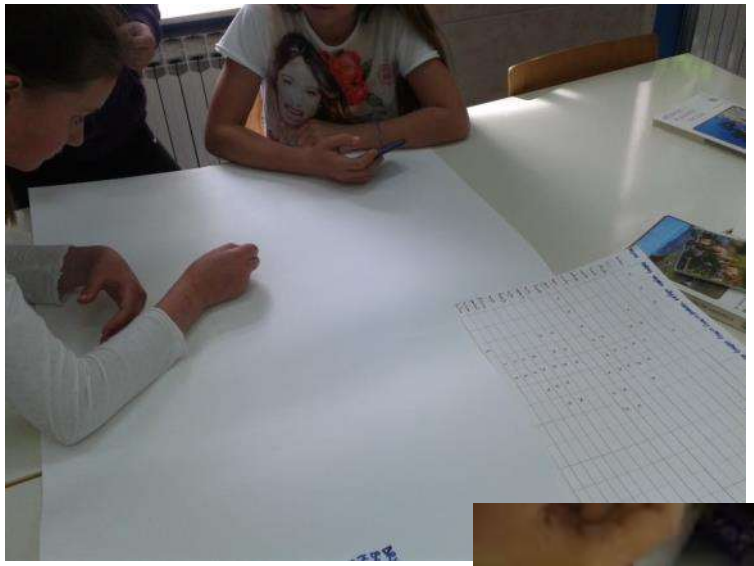
GRMOVI
Brnistra
Bušin
Lavanda
Japrin
Mirta
Ružmarin
Trilja
Kadulja
Smilje

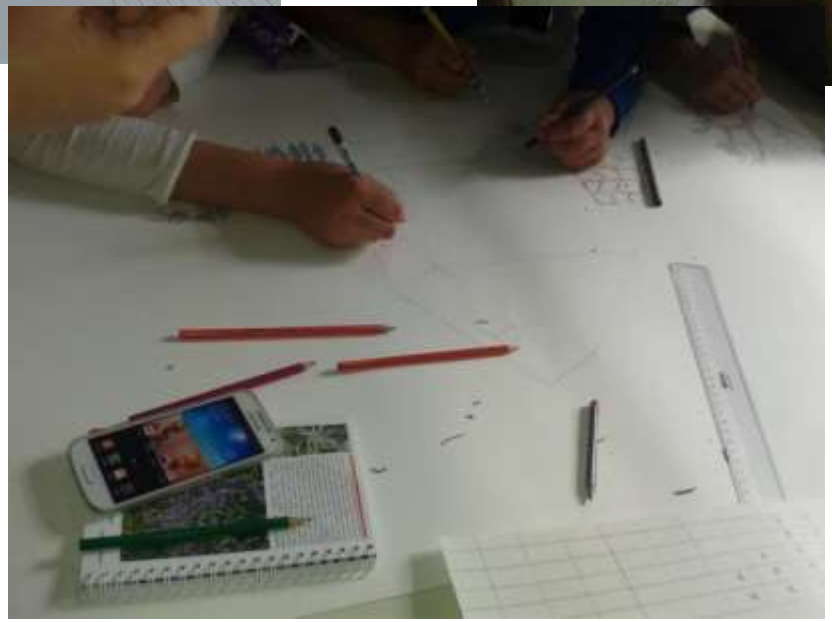
NISKO BILJE
Ljubičice
Zumbul
Tulipan
Šafran
Perunika

The calendar of flowering

BILJKE	SIJEČANJ	VELJAČA	OŽUJAK	TRAVANJ	SVIBANJ	LIPANJ	SRPANJ	KOLOVOZ	RUJAN	LISTOPAD	STUDENI	PROSINAC
bademi	X	X	X									
dud					X							
planika										X	X	X
trešnje			X	X								
maslina				X	X							
oskoruša					X	X						
brnistra					X	X	X					
bušin				X	X	X						
japrin	X	X	X	X	X	X						
lavanda						X	X	X				
mirta							X	X				
ružmarin			X	X	X							
trešnja			X	X	X							
kadulja					X	X	X					
smilje				X	X	X	X					
šubirice				X	X	X						
zumbuli				X	X							
tulipan				X	X							
šafran			X									

According to the calendar of flowering, students determine which plants to plant in each part of the garden (the first condition which will be respected in the formation of the garden)





The house is facing north

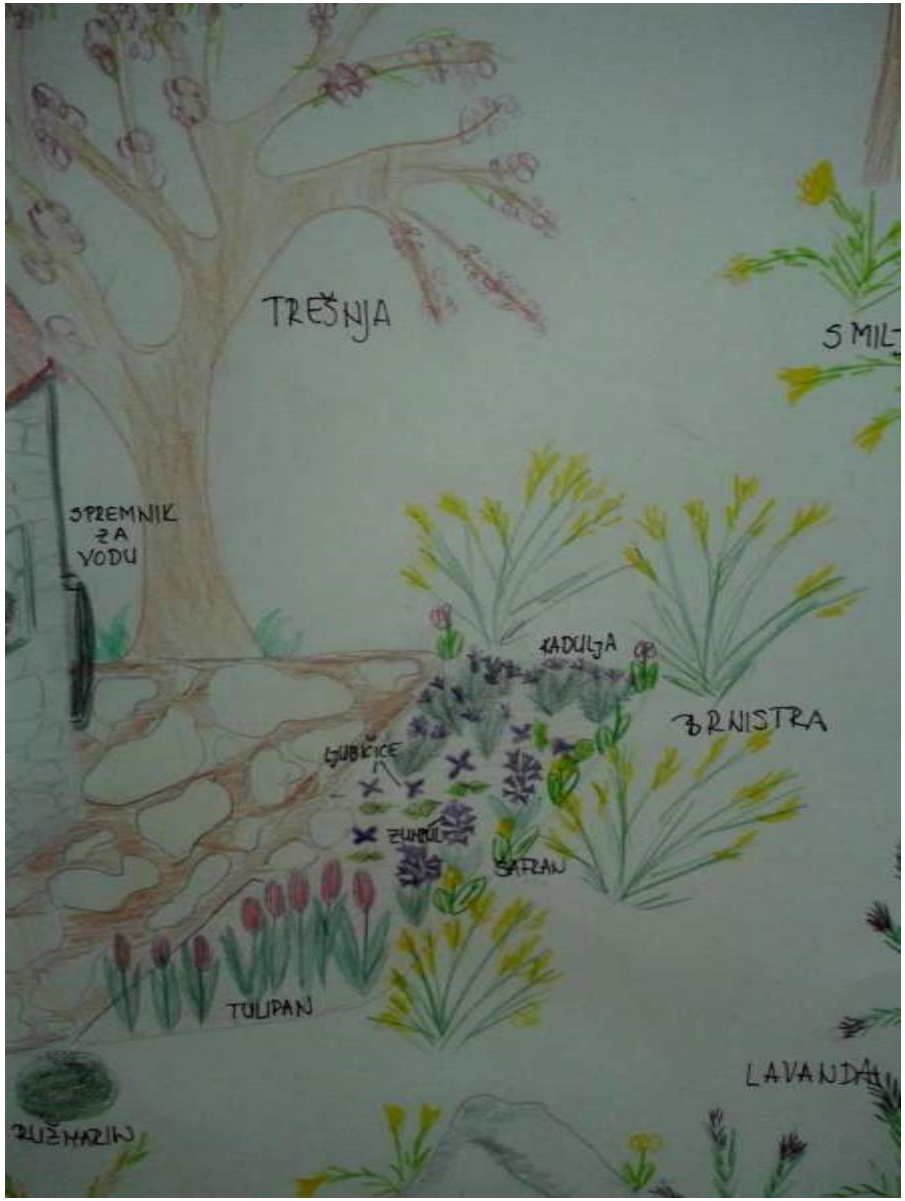
JUG
JAPRIN
OSKORUŠA
MASLINA
TREŠNJA
SMILJE
ISTOK
PLANIKA
BRNISTRA
TULIPAN
LAVANDA
RUŽMARIN
RUŽMARIN
MIRTA
MIRTA
MURVA
TRŠLJA
TRŠLJA
SJEVER

- The house is situated in the middle. The garden will be developed around the house.
- The house has a driveway and it is paved with Brac stone of irregular shape.
- Gutter around the house collects rainwater from the roof. Water is stored in metal tanks lined with wood (natural look).
- Each part of the garden is designed so that tall trees don’t block the sun for bushes and flowers.
- Given the diverse calendar of flowering, during the whole year one corner of the garden has flowers and greenery.

- Mulberry and rowan are planted away from home. It will provide a delicious fruit. Insects, that come because of the fallen sticky fruits, will be avoided.

- Cherry and almond are located next to the house because of fragrant flowers. The fruits don’t fall so much and do not attract a lot of insects.

- Olives are located in the southeastern corner of the garden, along the fence. They have decorative wood, and also can protect garden from the wind.



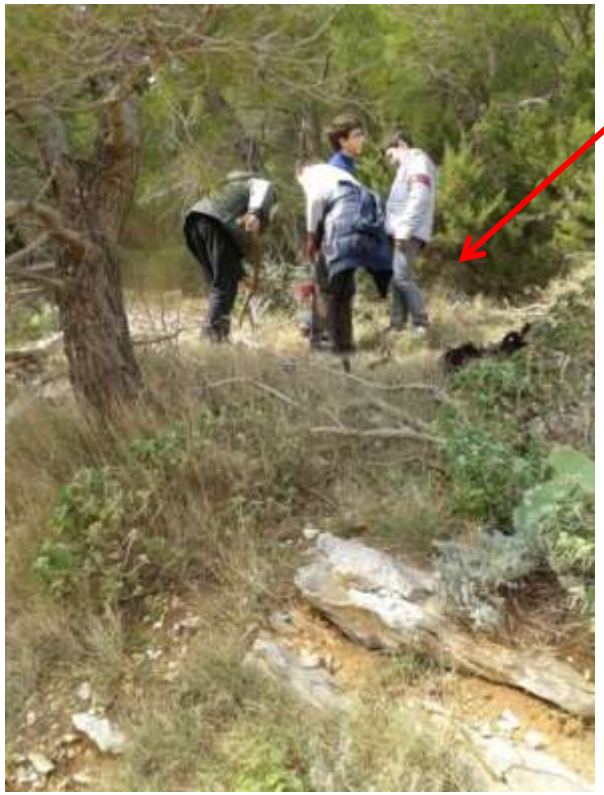
- Under the window there are fragrant and colorful spring flowers: crocus, violets, hyacinths, tulips and sage.
- Flowers are surrounded by flowering broom. The luxury of colors and scents

- The driveway is marked with rosemary and mint.
- The boundaries of the garden are defined with bushes: mastic tree, lavender, fragrant laurustinus. Bearberry tree, in this part of the garden, blooms the last.

Tired of planning but very satisfied with their garden!

Work in the classroom

- Creating a garden in the classroom (integrated with TE)
- Students collect material for making garden in the fieldwork before working in the classroom.



Choosing a place to collect soil

Soil type - black soil

They gathered stones and sand.

Stones and sand will be placed in the container before the soil. Their purpose is to allow better evaporation of deposited water,from splashing, through nested tubes. This prevents deterioration of the roots of plants due to excessive moisture

Tubes for air and evaporation of excess water

black soil

sand

stones

Humus

Stones and sand

Application of soil


MRKVA


KOPR

Planting beans and sowing carrots and dill.

Our little garden

TECHNICAL EDUCATION

TECHNICAL SOLUTIONS FOR
SUSTAINABLE WATER MANAGEMENT

TE topics

- Living environment and the role of technics
- Wood, tools and wood processing

Topic: GARDEN AND WATERING

The objective:

- connecting topics with life
- to determine if a garden can be maintained green (active) during the period without water (during droughts or in occasional absence of the owner)
- to solve problems using tools and knowledge of technics

The outcomes:

a) To identify the natural, social and technical elements of the personal environment
b) To introduce simple tools for wood processing, using them in practical problem-solving tasks

Gathering information about the social and natural problem to be solved using technical knowledge and resources:

- Observing the types of plants that grow in the environment, bushes, low vegetation and herbaceous plants
- Exploring the possibilities of collecting and permanent storing the water for the plants needs
- Studying the types of soil in which the plants grow, porosity, retention or loss of water
- Predicting the necessary elements for a self-sustaining garden

Students' activities:

- observing, collecting data on the amount of water needed for watering plants
- collecting material for the production of self-sustaining garden in the classroom
- processing information collected in reality and literature

Creative work:

- creating a plan for making the garden
- collecting concept designs and materials to create the garden
- making garden in the classroom
- conclusions

DIDACTIC SCENARIO

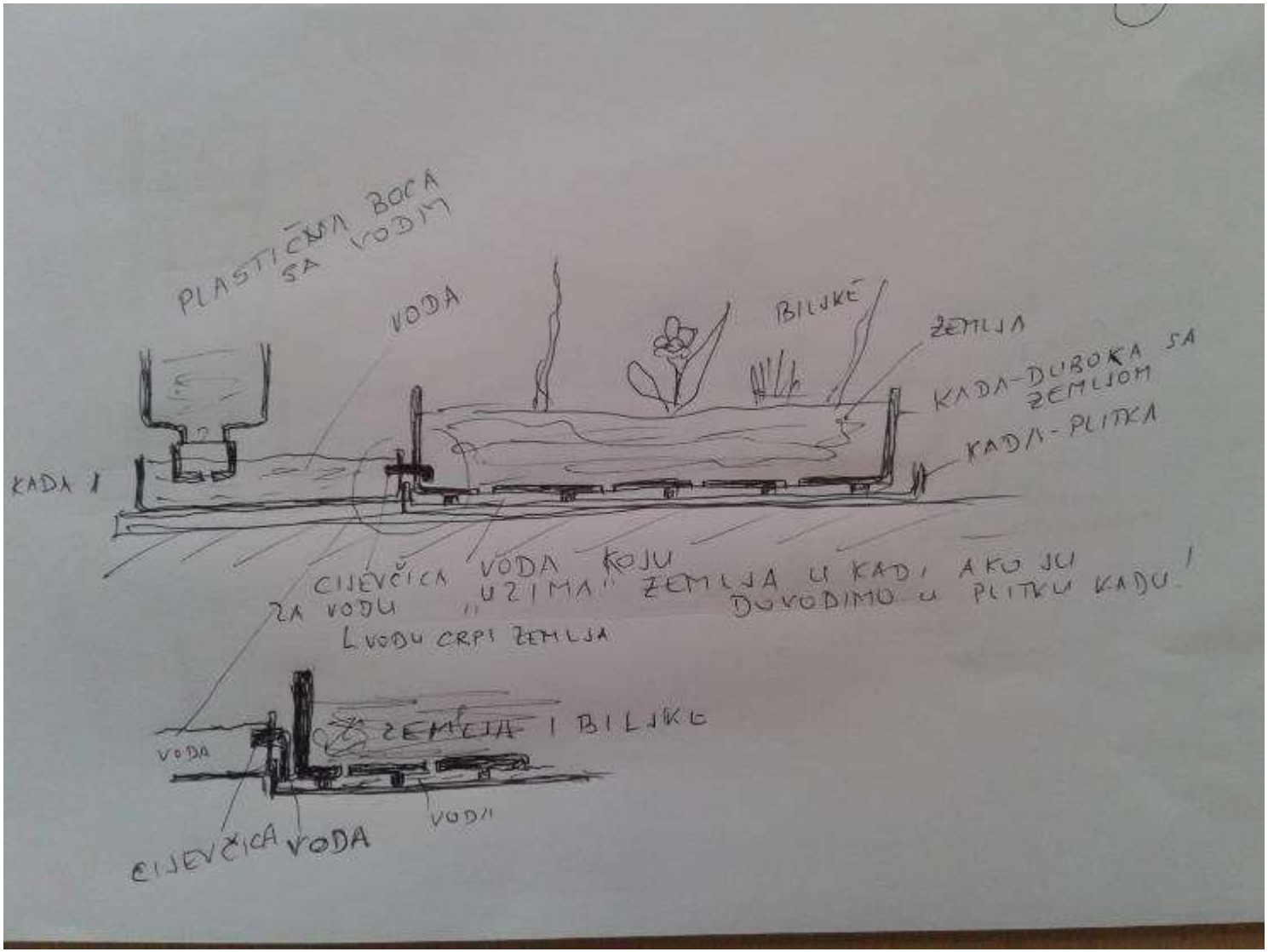
1. **Discussing** on conditions necessary to enable enough water for the plants in the garden. The required amount of water depends on the type of plants, the type and composition of the soil, the season.

2**. Identification** of the elements necessary for a self-sustaining garden:

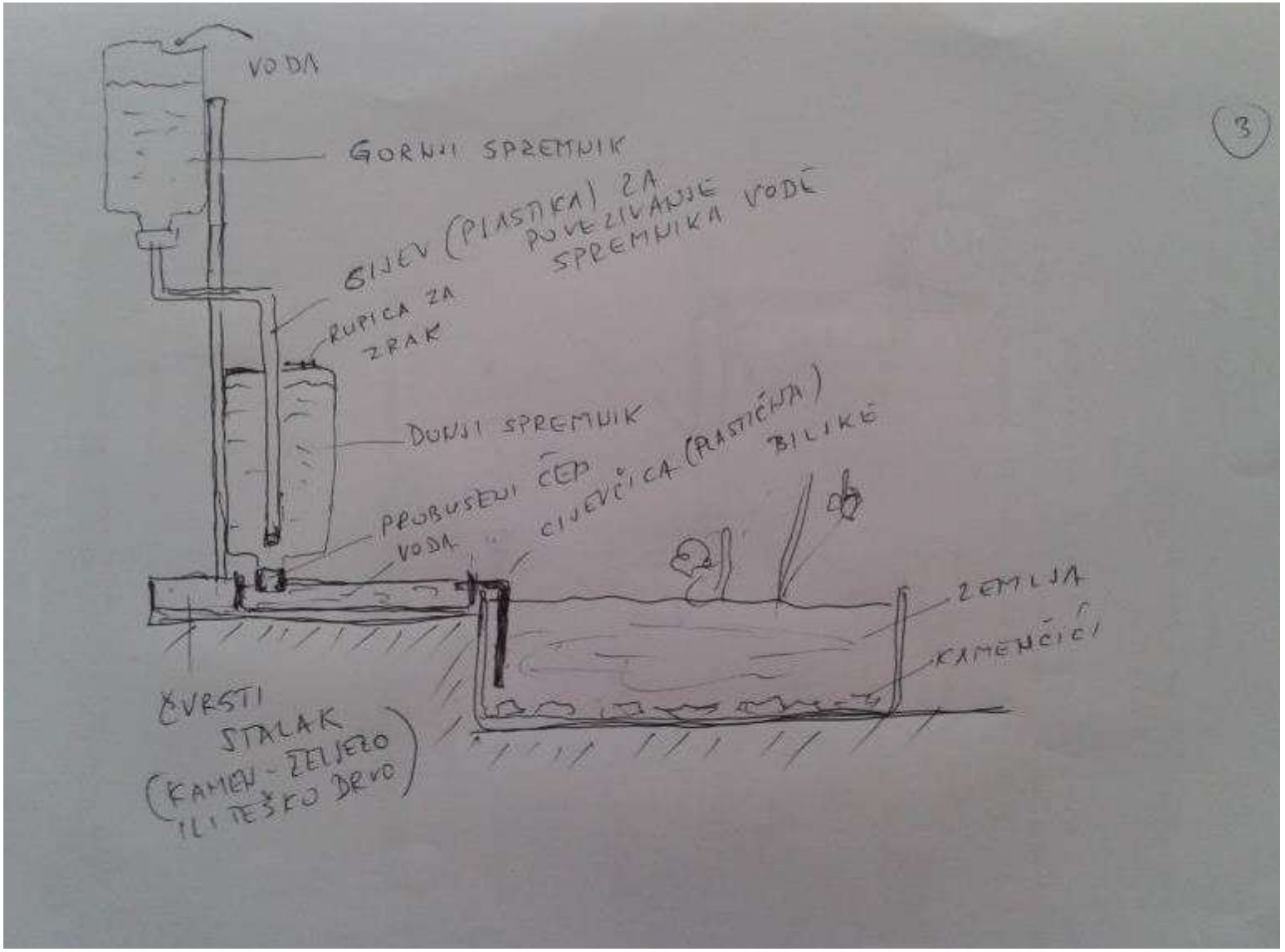
- Source of water: rainwater from the roof
- The inlet hose to the tank
- Water Tank
- Inlet hose
- Plug for flow control

3. Problem solving

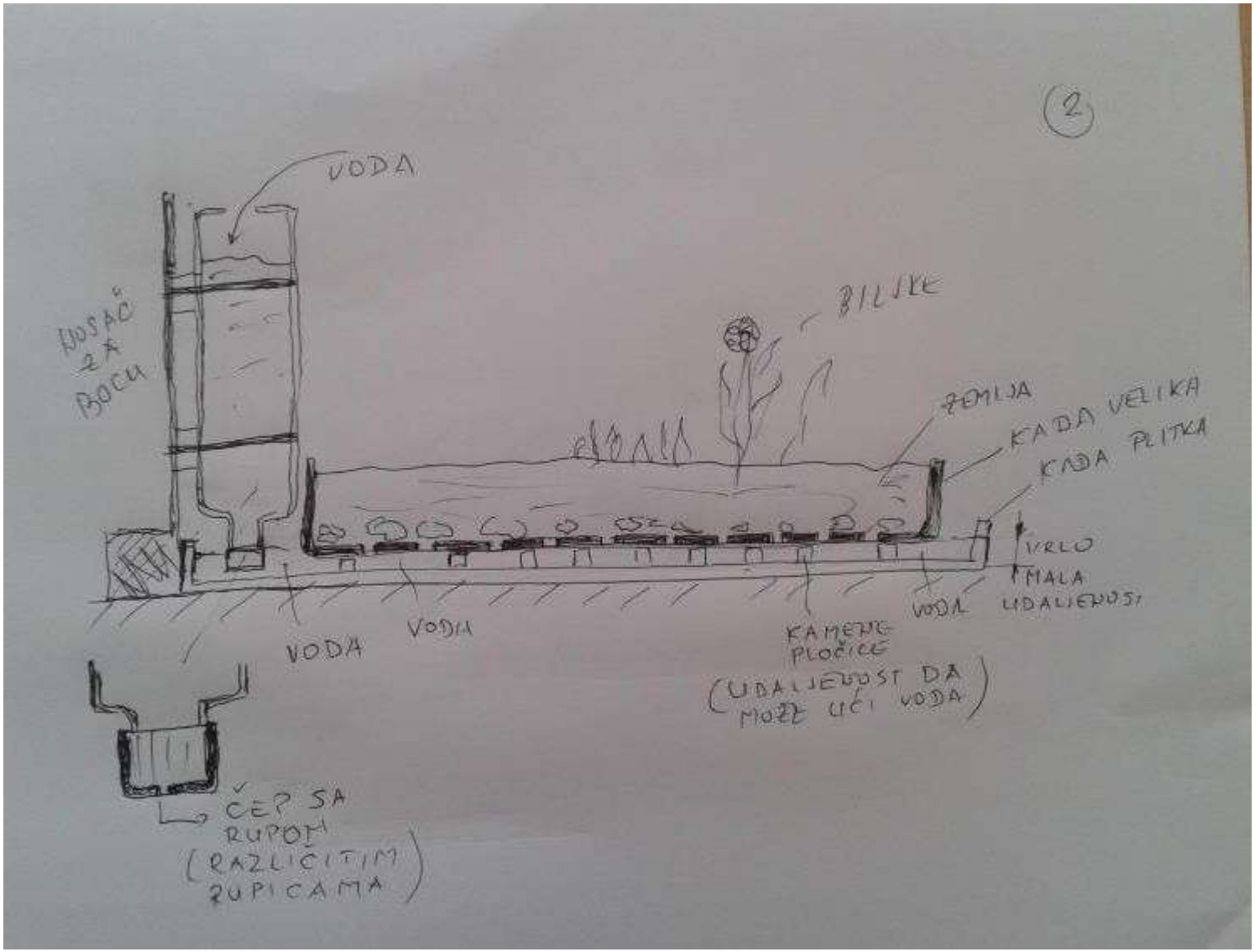
Based on students' suggestions, the teacher sketched technical solutions.
Feasibility of each solution is discussed.



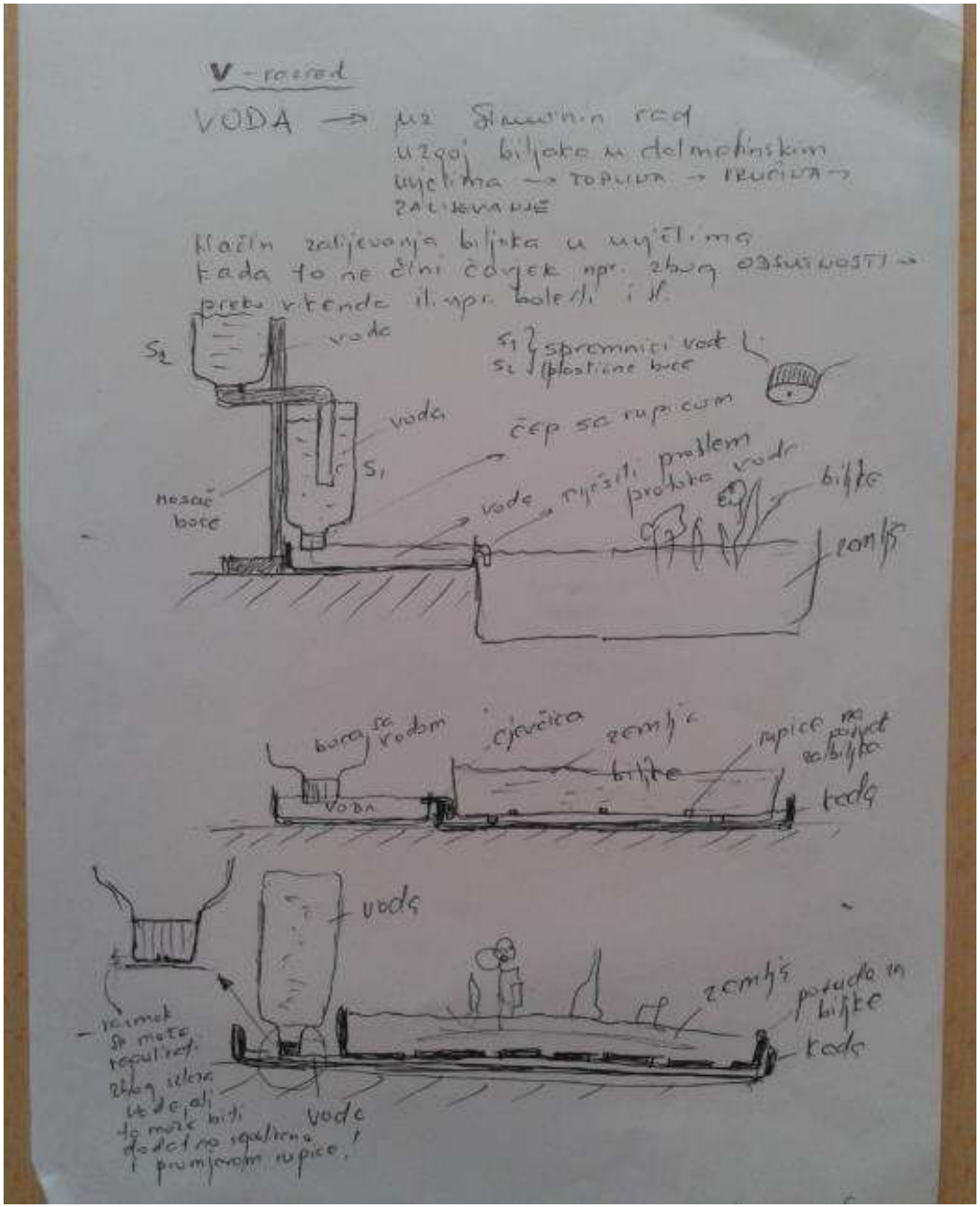
3 plastic containers suggestion was complicated.



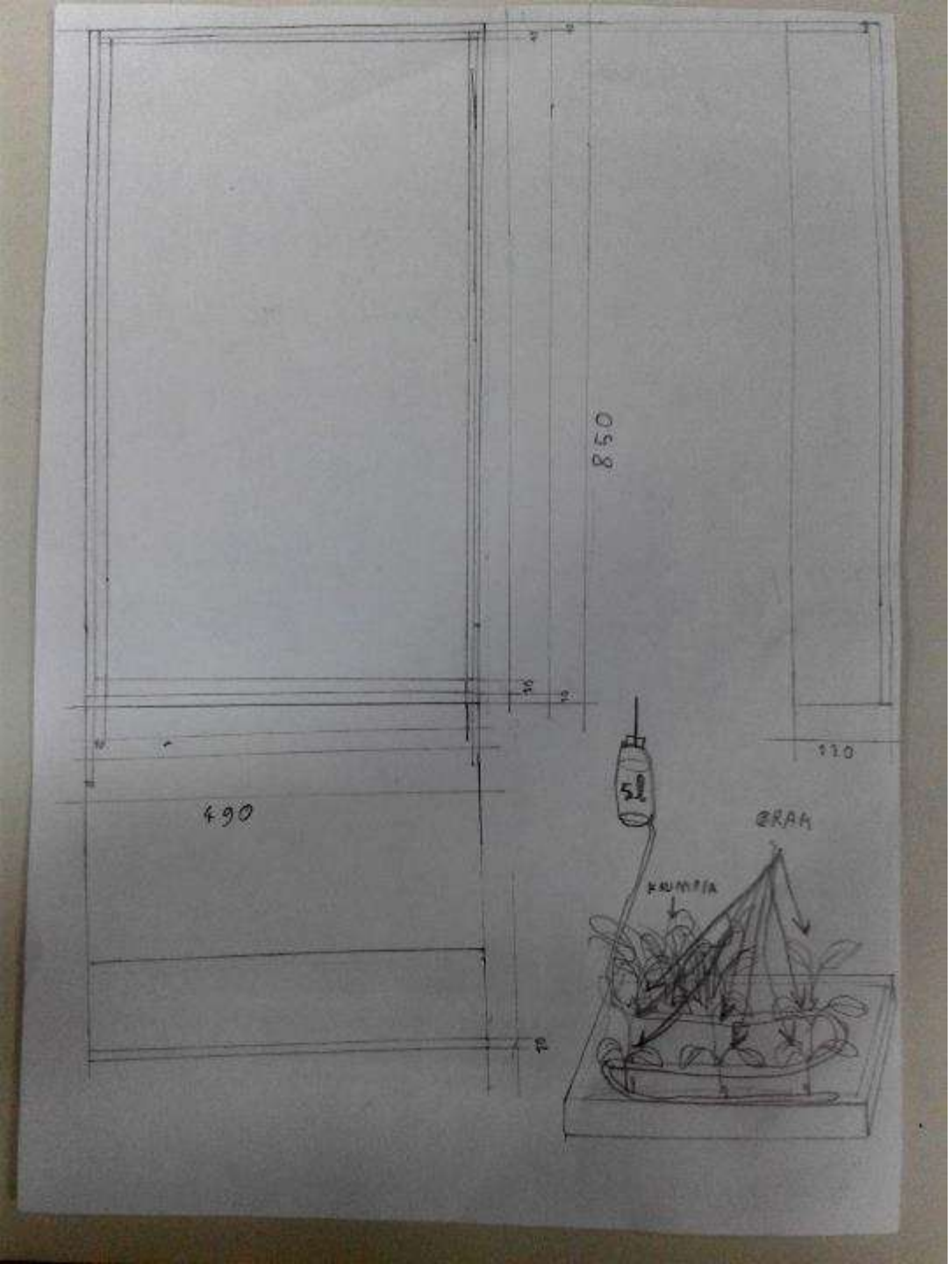
2 containers - still too complicated to perform.



Third idea. A problem : How can we put a container under the container in the natural garden?

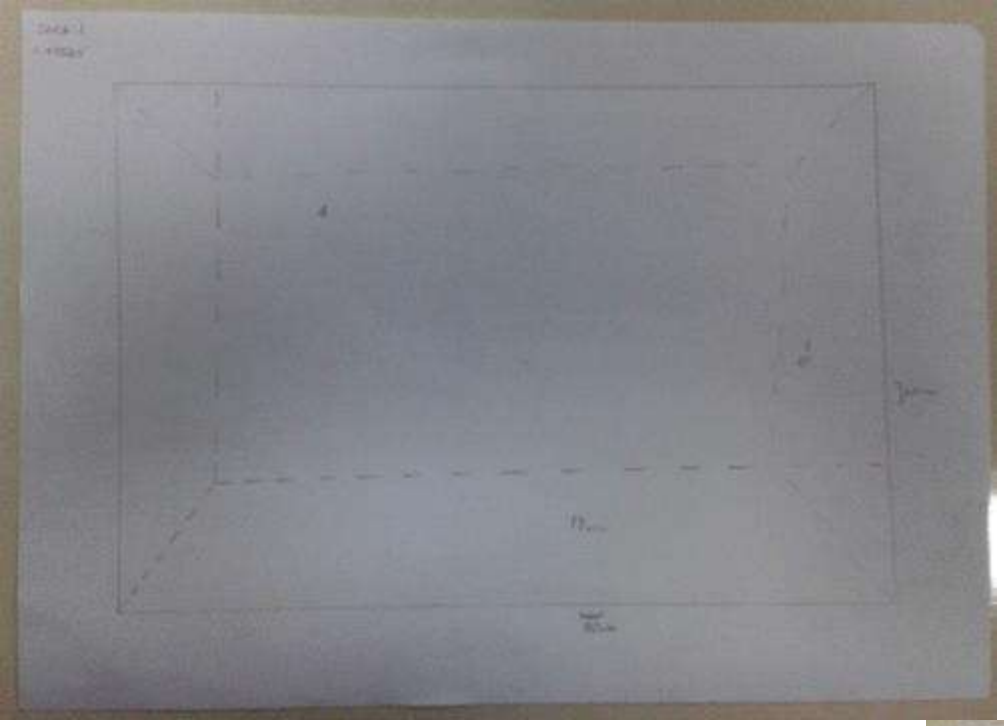


In the end we accepted the fourth, most feasible idea proposed by a student.

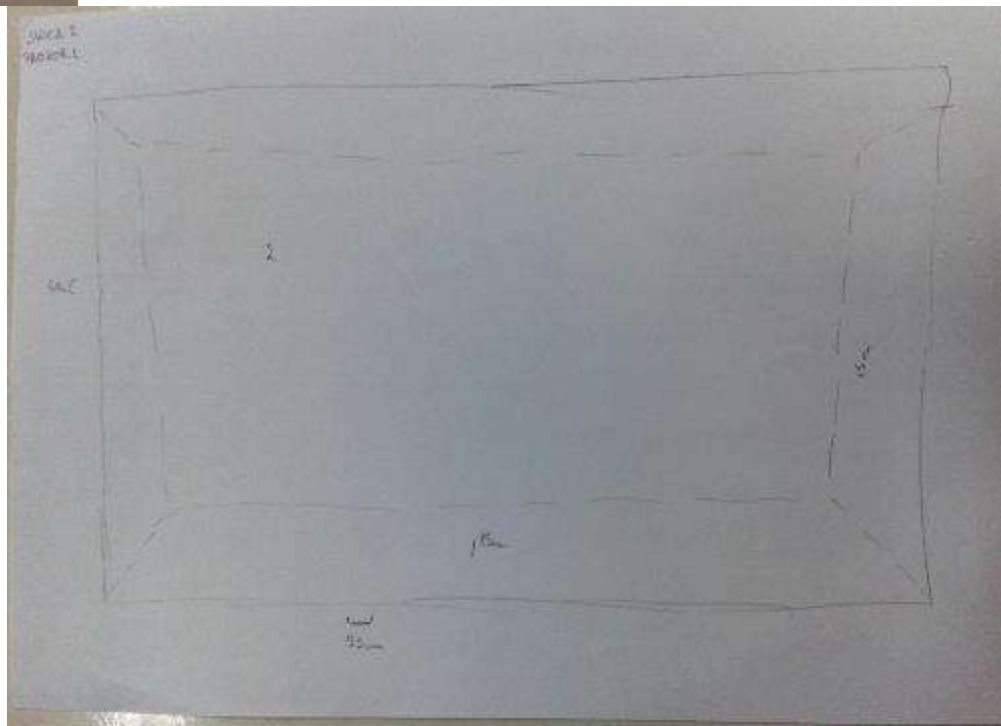


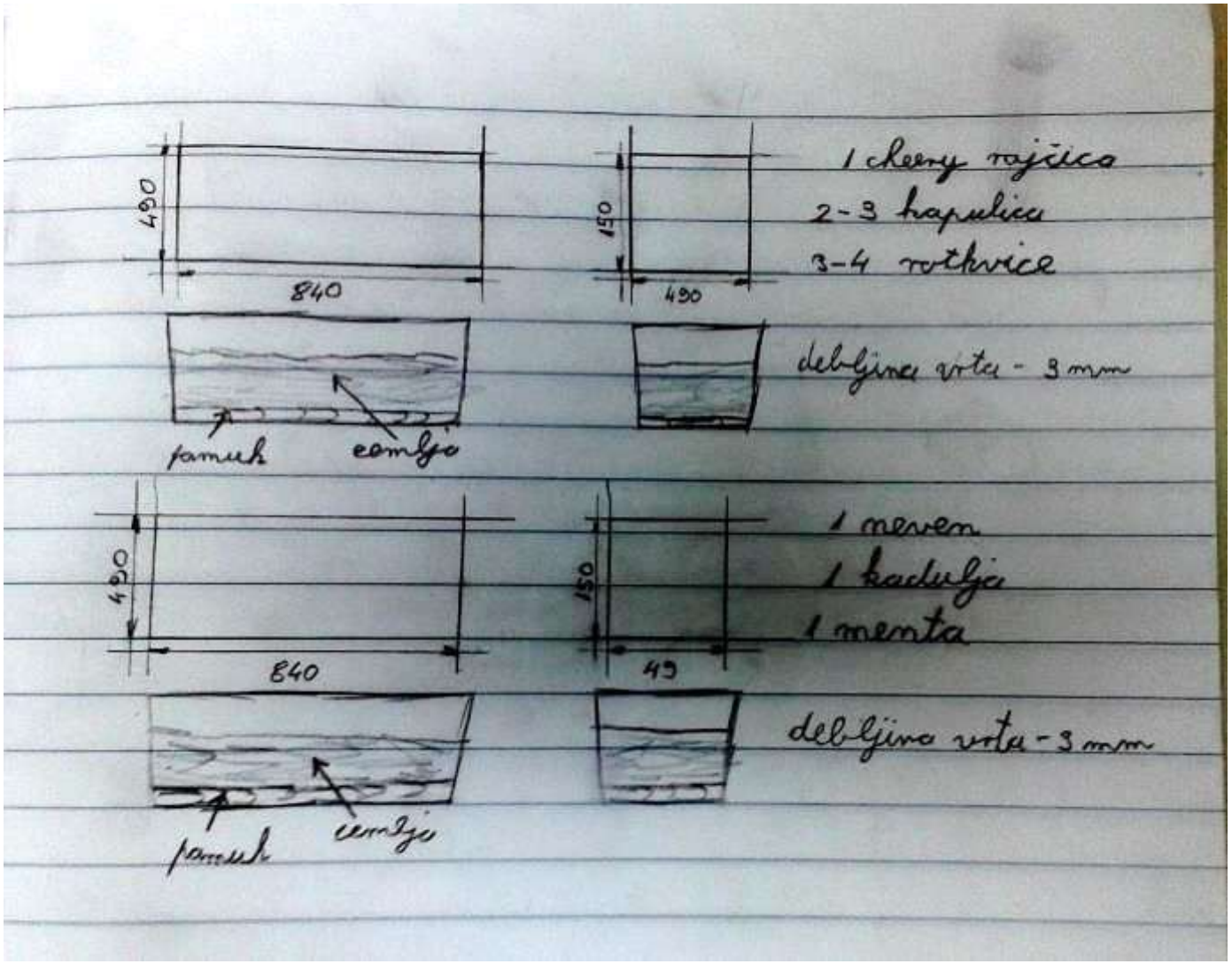
The elements needed:

one tray, one water tank, one tank holder



The measures will be adapted to the area where the garden will be located.





Preparation facilitate the execution.

SELECTING PLACE FOR THE GARDEN IN CLASSROOM

The window facing southwest, during the day sufficiently sunny, bright and airy.

The beginning - measuring length, width and height of the area for the garden.

Agreeing on the size of the garden.

We decided to make a garden of three boxes of styropor incorporated in one whole.

School handyman helping us


SUPPORT
YOUR TEAM
N.81

We placed vertical plastic tubes for air supply and ventilation of the garden.

We concreted the outer sides of the garden

The space is ready for the final phase - planting and irrigating

Preparing the water tank


NATIONAL
GEOGRAPHIC

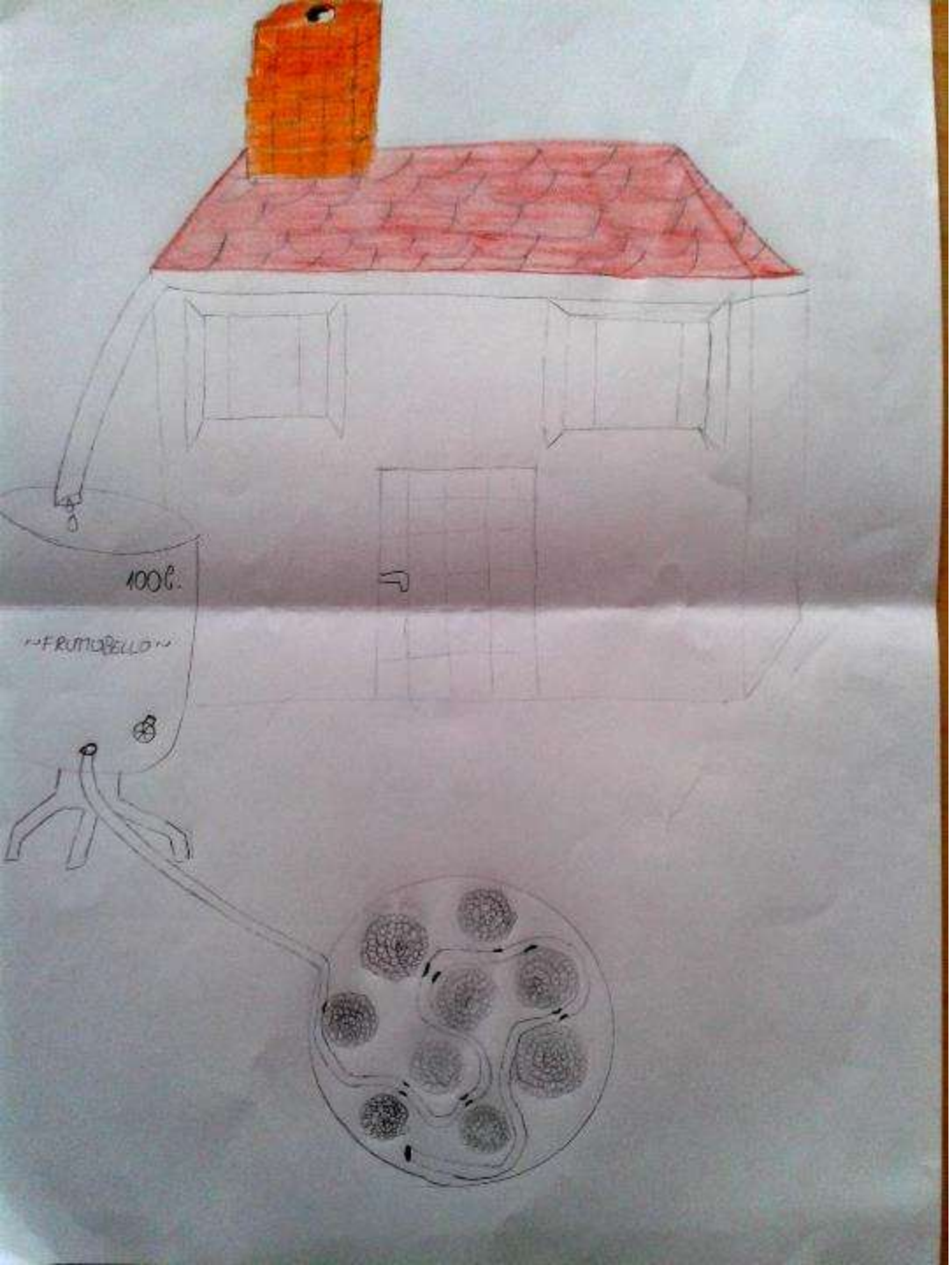

NATIONAL
GEOGRAPHIC

We supported the plants with wooden sticks carriers.

This garden can be set up in the outdoor courtyard or garden beside the house...

It is important to fulfill the following conditions:

- To ensure sufficiently large water tank
- To construct system for collecting rainwater
- To make water- purifier filter that will prevent the entry of waste in the tank
- To protect the container from direct sunlight



Sketch of external self-sustaining garden system performed by a student.

CONCLUSION

We believe that the described way of irrigating the garden is acceptable for the island's conditions.

MATHS

„WATER"

5th GRADE

MATHS AND WATER

In order to see the connection between Maths and water, we'll go back in past.

Back in those times people had more immediate relation with water; they knew they would have as much water as they can keep. Water was kept in water tanks and wells.

To collect water as quickly and efficiently, they used certain surfaces as „piover" – collecting surface. The size of the collection surface had to be matched with the size of the water tank.

The roof as collecting surface

- Traditional houses have roofs whose architecture and slope depends on the region. In coastal areas roof slope is lower, and peak angle (ʒ) is higher than in the mountainous region (ſ). These roofs have smaller surface area then those in mountain areas. Dalmatia is affected by strong winds, and lower slope means less wind resistance. In the mountain areas roofs are steep and tall so that snow could easily slide off the roof.


VISINA
KROVA
PRIMORSKI
KRAJ
GORSKI
KRAJ
β > α

TEACHING UNIT: Multiplication and division of numbers, the use of measure units

TEACHING OBJECTIVES: The application of acquired knowledge in everyday life situations

DIDACTIC SCENARIO

INTRODUCTION

- Information on "invariable" data in problem tasks:

Experience shows that during average rainy day the amount of water is 20 liters per 24 hours on 1m2 surface.

The creative work task

- To explore the effective and responsible way of managing water on farms without public water supply: a) how large should *piover* be for optimal water supply of the field house

Preliminary research and the benefit from results

- To explore the ways of water supply in field facilities
- To identify the advantages and disadvantages of the identified ways of supply
- To propose a better water supply solutions

- **THE PROCEDURE**

Finding a rule (formula) to calculate the size of water tanks (wells) and collecting surfaces (piover).
The size will depend on:

- the purpose of water tanks (supply of the residential building, stables, watering plants ...)
- period of use (all year, semi-annual, summer - winter ...)
- the average monthly rainfall in the region

This data will enable us finding a rule for calculating the optimal size of water tanks and collecting surfaces.

The rule for calculating optimal size of collecting surface

monthly number of days of staying **(B)** · daily water consumption per person **(D)** = **monthly needs** (**X**)

average monthly rainfall **(M)** · collecting surface area **(P)** = **monthly supply (Y)**

if **X = Y** we have the **optimal size** of water tanks

The rule for calculating the optimal size of water tanks: **B · D = M · P**

Since the data **B, D** and **M** are given, we calculate the surface of piover using the rule :

P = B · D : M

The data needed for calculating the surface of the tin

MONTH	AVERAGE RAINFALL	CONSUMPTION PER PERSON	NUMBER OF DAYS STAYING
SIJEČANJ	132 l		
VELJAČA	94 l		
OŽUJAK	94 l		
TRAVANJ	87 l		
SVIBANJ	56 l		
LIPANJ	52 l		
SRPANJ	31 l		
KOLOVOZ	71 l		
RUJAN	70 l		
LISTOPAD	110 l		
STUDENI	157 l		
PROSINAC	139 l		

- Information on the average rainfall per month is given in the literature. Students must evaluate the average consumption of water (according to the type of staying and visitors needs: eating, drinking, hygiene...)

- Based on all the data it was found that one-day stay requires about 15 liters of water per person. Overnight staying includes at least one rational shower, which increases the required amount of water to 26 l.

MONTH	AVERAGE RAINFALL (M)	CONSUMPTION PER PERSON (Daily)	NUMBER OF DAYS STAYING (B)
SIJEČANJ	132 l	15	6
VELJAČA	94 l	15	8
OŽUJAK	94 l	15	16
TRAVANJ	87 l	15	22
SVIBANJ	56 l	15	36
LIPANJ	52 l	26	80
SRPANJ	31 l	26	120
KOLOVOZ	71 l	26	120
RUJAN	70 l	26	80
LISTOPAD	110 l	15	36
STUDENI	157 l	15	36
PROSINAC	139 l	15	8

PROBLEM SOLVING

- Calculating the size of *piover* that could fill up a water tank in January and July – the extreme months (minimum consumption and maximum rain / maximum consumption and minimum rain):

P = B · D : M

P = 6 *15 : 132 = 0,69 m2 (the surface needed in January)

P = 120*26 : 31 = 100,65 m2 (the surface needed in July)

Conclusion

- A simple calculation showed big differences in the amount of water required in January (at least) and in July (the highest). The size of the piover (and the size of the water tank) should be adjusted to this fact.
- Students can continue working on the project on a number of levels (which is the most rational construction, the possibility of mounting piover…
- Working on the problem students saw that the simplest mathematical knowledge can be used to solve very important problems, which increased their motivation for learning mathematics.

PROJECT "WATER„
SUBJECT: ARTS

TEACHING UNIT:
color - chromatic and achromatic colors

Teaching units:

1. achromatic colours – art problem: PAINTING TEXTURE
2. Chromatic colours – art problem: Primary and secundary colours, lazurne colours
3. Chromatic colours – art problem: Color density, pad, stain, move

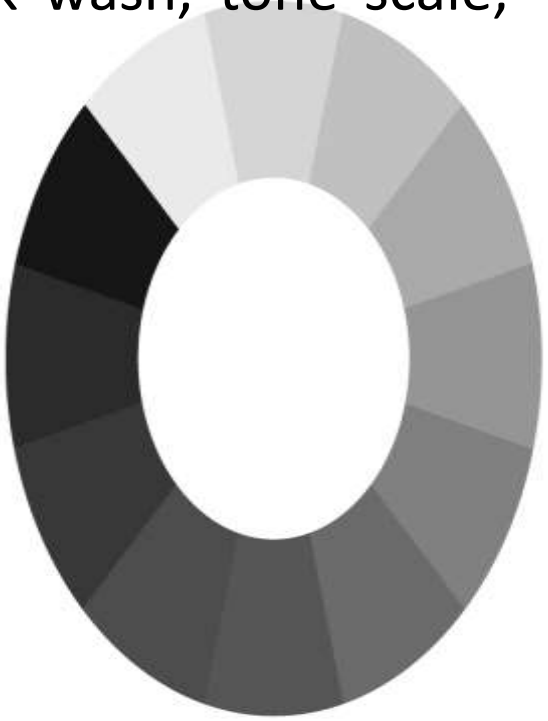
WATER in fine arts

In fine arts water appears as a motive and as a means in some art techniques. Students will be introduced to some features and characteristics of these techniques through practice and works of art using their own creative expression.

Educational Objectives: adoption of new concepts, introduction and using basic methods of work with "wet" painting techniques, development of motor skills, perception and creative imagination, observation and evaluation of different colorful atmosphere

Teaching units: achromatic colours – painting, ink wash. Frontal and individual work from memory and imagination. Teaching methods: discussion, demonstration, varying and combining. Key concepts: achromatic colours, faktura, tone. Motive: SOUTH.

Teaching aids: examples of works of art (Rembrandt: Lying lion, Crnčić- Senj Storm), materials for ink wash, tone scale, blackboard.



Didactic scenario

INTRODUCTION:

Sharing materials

1. Demonstration of techniques: by adding more or less ink we get different tones (students will conclude that it is the same color, only brighter or darker)

3. Practice: working wet on dry and wet on wet, experimenting with spraying, smearing and spinning color. The resulting variety of painting surface is called *faktura (painting texture)*.

4. Motivation: talking about *jugo (*what kind of wind is it, what happens during *jugo*, how clouds, waves and crown are moving, objects that the wind blows…)

Using the example of the work of art

we notice the tone and painting texture.

TASK REALIZATION: using different tones and textures students tend to show their experience of south wind *(jugo)*.

ANALYSIS AND WORK EVALUATION according to wealth of tones and textures, but also the expressiveness (whose work evoke the weather atmosphere and how it has been achieved. How techniques selection has contributed?)

Comparing with the artwork - spot the similarities and differences.

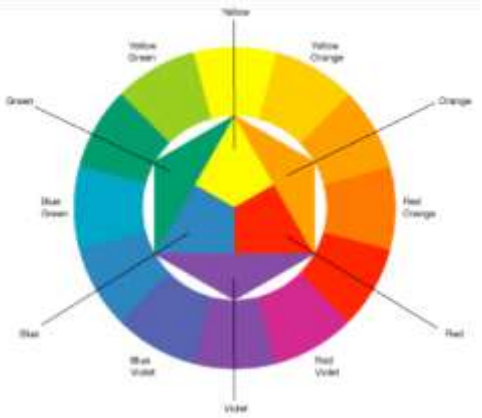
2. Teaching units: chromatic colours – painting, watercolor.

.

Teaching methods: conversation, focused observation, combinations and variations. **Key words:** basic and derived colors, color stain, soft and hard edge, mirror symmetry.

Motive: still life.

Teaching aids: examples of works of art (Raškaj: Summer eve, Heda: Still Life), circle color, material for watercolor, blackboard.



DIDACTIC SCENARIO

INTRODUCTION:

1. Sharing materials

2. Demonstration of techniques: watercolors feature is clarity and it's neccessary to use a lot of water. We have used only primary colors, derived colors we get with their overlapping. Thin layers of paint, which can be seen through, are called *stain colors*.

3. Motivation: conversation about the work of art (what can be used as a motive of still life; conversation about today's motive: glass bottles of various shapes - noting the similarities and differences in form and size, noticing details ...)

TASK REALIZATION:

The paper should be folded and the first part of the task we work on the upper half, using technique *wet on dry*. The bottles must be placed so that they overlap and each should be filled with stain color. On the lower half of the paper we work the same motive technique *wet on wet*, so it looks like a reflection on water.

ANALYSIS AND WORK EVALUATION: students have to identify and name a derivatived colors obtained by overlapping. They will describe the difference between the outline obtained work in the wet and the dry - called soft and hard edge.

On works exhibited on the board they will evaluate the purity and transparency of the colors and forms. Reflection as in the water (or mirror) we call *mirror symmetry*.

3. TEACHING UNIT: chromatic colors - painting, tempera. Frontal and individual work by imagining.

Teaching methods: conversation, focused observation, combining and building.

Key words: color density, surface, stains, move, texture

Motive: IF I WERE A TREE.

Teaching aids: projector and photos, example of work of art (Manet - Flowers in a vase), accessories for tempera, school board

DIDACTIC SCENARIO

INTRODUCTION:

1. Sharing materials

2. Demonstration of techniques: (opposite of watercolors, we use thick tempera, with a little water, and when the lower layer dries, the top layer of paint completely covers it. Paint is applied by surfaces, stains and strokes of different directions (textura).

3. Motivation: talking about trees (correlation with nature) - parts of tree, species, adapting to climate and the environment, usage and importance of preservation ...

TASK REALIZATION (painting by imagining): Close your eyes and imagine that you could turn into a tree. What kind of a tree would you be? Where would you be located?

Paint yourself as a tree, in tempera!

EVALUATION: students will analyze the composition, evaluate imagination and usage of technique possibilities

RELIGION

WATER

(holy water)

OBJECTIVE: To connect the content of religious education with the contents of other teaching areas and everyday life.

EDUCATIONAL TASK: To understand the meaning and importance of holy water at the church entrance

KEY WORDS: Blessing, ritual, baptismal font, holy water

DIDACTIC SCENARIO

1. **PRAYING START:** The song "Rivers of living water shall flow, let the Spirit pour out, to every thirsty heart bring God's love forever ....

MOTIVATION: Watching photos on presentation ***WATER***

What do these photos remind you of? (life, thirst, nature, eternity, beginning of creation, food, baptism ...)

INTERPRETATIVE TEXT READING

We read the text of John's Gospel 7, 37-39a "If anyone is thirsty, let him come to me!"

After text interpretation we go to church and participate in the ceremony of water blessing.

The priest talking to children about the role and the symbolism of water in religious ceremonies

We put water in the baptismal font for the water blessing.

And we prepare the salt.

While performing a water blessing, the priest says a prayer.

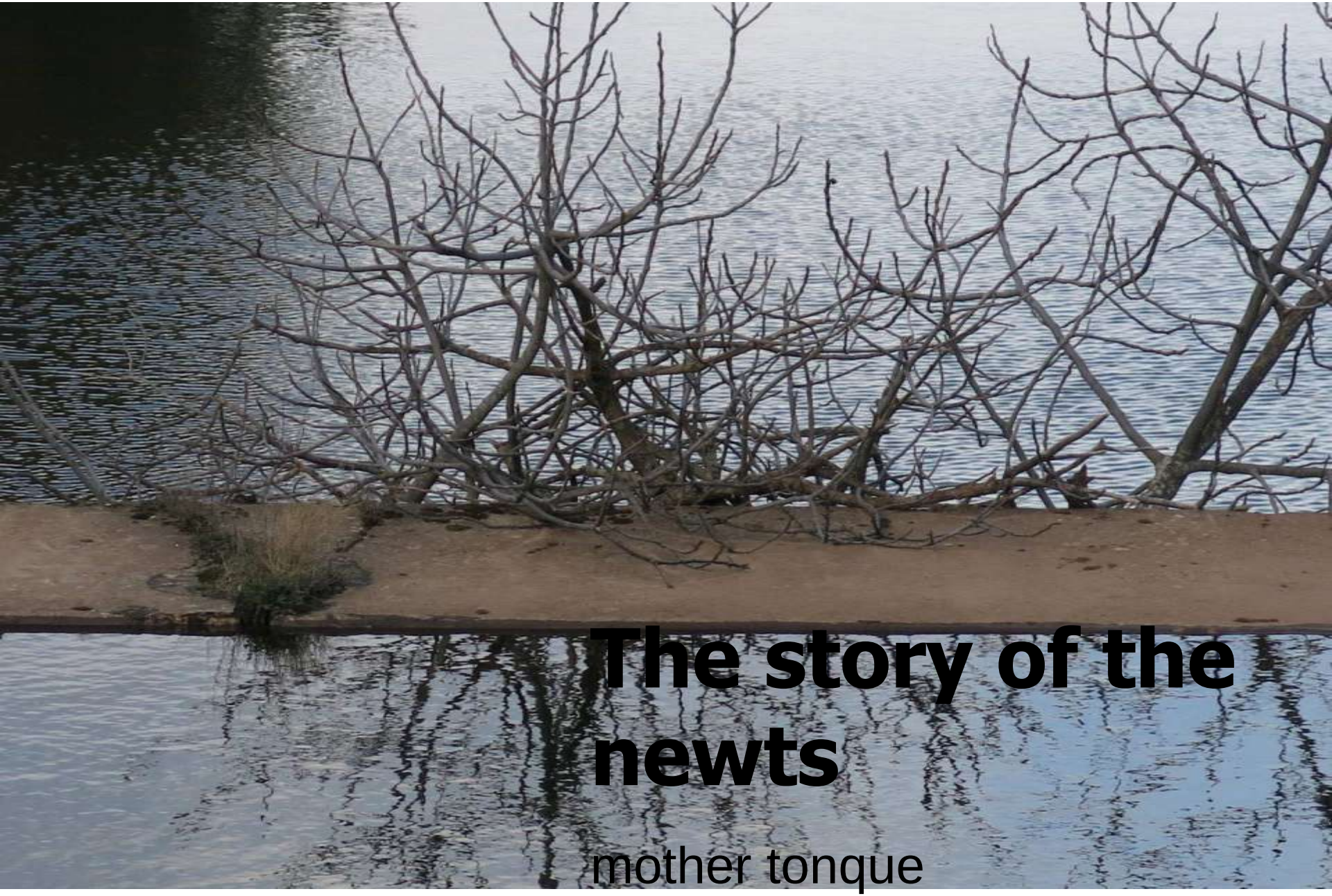
Students are placing holy water at the head, which is permanent reminiscent of baptism.

SYNTHESIS: water is present in all major Christian ceremonies (baptism - the sacrament of water).

As water has the cleaning power, so the sacrament of baptism cleans the soul from original sin. Water is life and baptized water reborn Christians to a new life.

In the end, students write a paperwork on the topic: **My encounter with the water at the entrance to the church.**

--Voda je puna tajni. Voda je nesebična jer služi drugome. Čisti i osvježava. Mirna je, ali nekad uzburkano buči i ruši. Ona čisti prljavo, okrijepi što je žedno, Voda je slična životu. Ima i jedna druga voda koju susrećem na ulazu u crkvu. To je blagoslovljena voda. Ona čisti i osvježava moju dušu. Po njoj sam primio u sebe Božji život. To je živa voda koju mi je darovao Isus.



The story of the newts

mother tonque

Introduction

- Fifth grade students took part in this project. Project includes reading, literature, oral and written expressions.
- Topics:
  fairy tale
  character description
  Storytelling in the first and third person

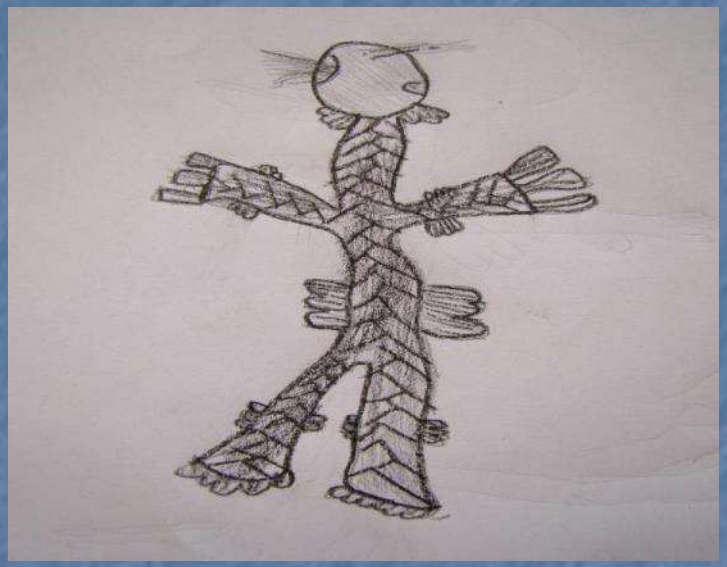
Expected outcomes

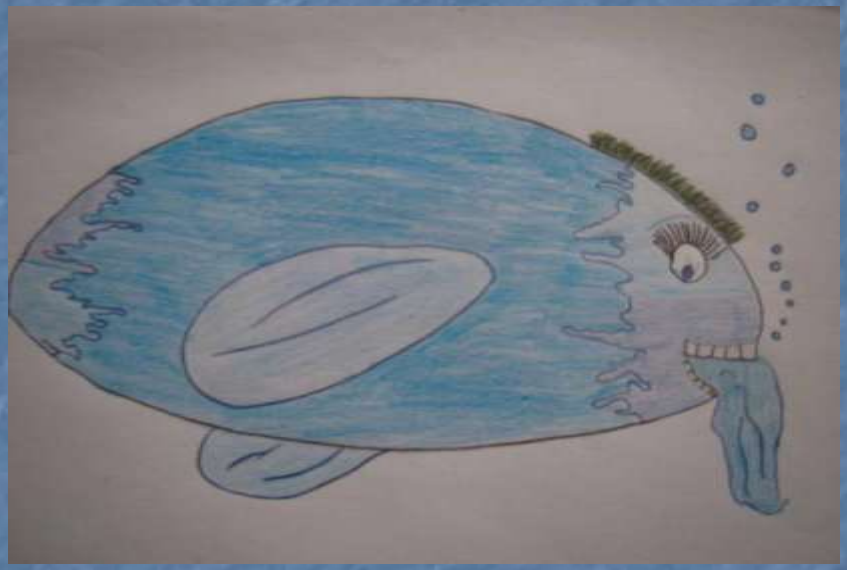
- Students will be able to:

  explain allegories examples
  express the experience of certain parts of the text
  widen the active vocabulary
  identify the literary genre (fairy tale)
  describe a fictional character
  compose a fictional story in the first person
  discuss and make conclusions
  argue the importance of preserving all beings, explaining their similarities and differences
  discuss the importance and the need of nature protect


Project phases

1. Motivation for the reception of literary text





- Students imagine and describe how the newts look like.

- Student works:

1. Newt is a huge reptile. He has fins and gills. He has small ears and large frightened eyes. His hair is made of red sea coral. He is very shy and lives in a hidden underwater caves. We can pass through his body. He takes care of the water cleanliness.

- *2. Newt has a human – shaped, bluish body. He is half a meter high. He has webbed feet and breathes using the gills. On the back he has a large fin that makes him look a little funny. He can merge in the water he lives in. On the head he has two large eyes. His hair is made of seaweed.*

3. Newt has orange eyes through which he breathes. His mouth are red. He may have a various colors, depending on water where he lives. He has human legs and instead of hands he has fins.

2. Listening to the literary text

- Students are listening fragments of the "Fairy Tales of the newts" written by Karel Čapek (part of the text that describes the life of newts).
- They express their own experience of the text.

3. Talking about the text

- Through heuristic conversation, students discover the theme and content of the text.

- *What did you learn about the life of newts? In which areas do they live? Which characteristics writer gives to the newts? Who actually has these qualities? Which stylistic figure the writer used?*

4. Creating words

- After reading we highlight words which include the word “voda” – “water": vodeničar - miller, vodonoša - water carrier, vodič - guide, vojvoda - duke, razvodnik - distributor, soda voda - soda water. Students expand a list of words. They verbally describe the meaning of words which are part of the standard Croatian language

- Words of Croatian standard language:

  vodoinstalater - plumber, provod - fun, vodoopskrba - water, razvodnik - rail, razvod - divorce, vodoskok - fountain, zavodnik - seducer, vodostaj - water levels, navodnjavanje - irrigation, vodenica - water mill...

They create new words and join them their own meanings:

vodomost – a bridge made of water
vodoljubac – a man who loves the water
vodonebo – water colored sky water
vodnici – water corridors
toplovodice – hot water springs
vodosmrt – drowning
plavodovac – blue sea animal

vodobus – a bus that runs over the water

vodolovac – a man who collects water supplies

vodovolac – a man who loves the water

vodokralj – king of all waters

vodoples – a dance with water

ispivodura – a man who drinks too much water

vodopjev – singing in the water

vodobilj – water plant

vodokoz – water goat

vodored – the lakes arranged like trees in alley

vodopljus – jump into the water

vodnik – a newt who prevents low tide

vodotrgovina – a store for the newts

vodokrad – water stealer

vodoval – tsunami in the world of newts

5. Writing

- We are talking about areas where newts can live.

  Can you imagine the place that the writer describes? Have you ever seen a similar environment?

- Photos of the wetland areas are exposed in the school hallways.
  The students observe photos and then describe a day in the life of their newts in selected landscape.

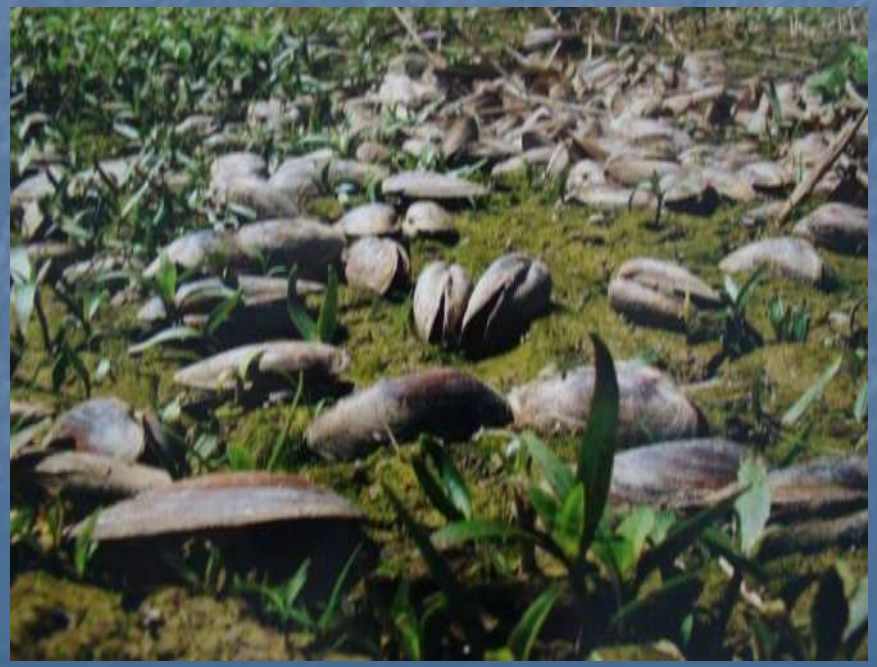
6. Analysis and works correction

- Students read the papers in front of the group. After joint analysis we choose more successful ones.

They continue to write in pairs according to proposals of the group and according to their own ideas.

- Student works:

1. He lives in the shell that preserved three water drops and one kingfisher insect . His curtain is water algae, and the roof above him is a shell. When the flood comes, the inhabitants change , the new algae grow, the water disappear , and he continues living with three drops of water and one kingfisher insect.



- *2. I'm a newt. I live in a pond surrounded by trees. The trees grow out of the water, water lilies float on the calm surface. Frogs are hiding, insects are resting, and fish are swimming carefree. The bottom of the pond is muddy and everything looks black and dark. The algae look dead. Everything seems dead. Here where I live treetops are so thick so I never see the sun. Too bad, because I love the sun. That's why I go to the other side of the pond every day. You might think that I am very different from people, but I am not. I even have a pet, moving-moving frog. This is the best frog I've ever met, and I met hundreds of them living in this pond for years.*

7. Debate – setting up the problems

- Students listen to the selected part of a fairy tale about the annual conference of the newts. They imagine where conferences can be arranged . They describe those places.

- We arrange a conference for newt in the classroom. Each student pair presents his problem.

- Students' exposure:
- *Our problem is the disappearance of trees. The world is getting less trees which will lead to a global ecological disaster. We need to stop cutting trees because trees are important to humans and animals. Help us!*
- *At the factory near our forest there was an explosion. Acid and toxic substances got into the river and our oyster farm was destroyed. The river is completely contaminated. How do we prevent it from happening again?*

8. Debating

- Having analyzed the problems, comparing them and commenting, the students came to the conclusion that all the above problems could be summarized in four:
- 1. How to protect newt from extinction?
  2. How to unite wetland animals?
  3. What can newts do for the well-being of the people?
  4. How to convince people not to intervene in the "business" of nature?

9. Proposing problem solutions

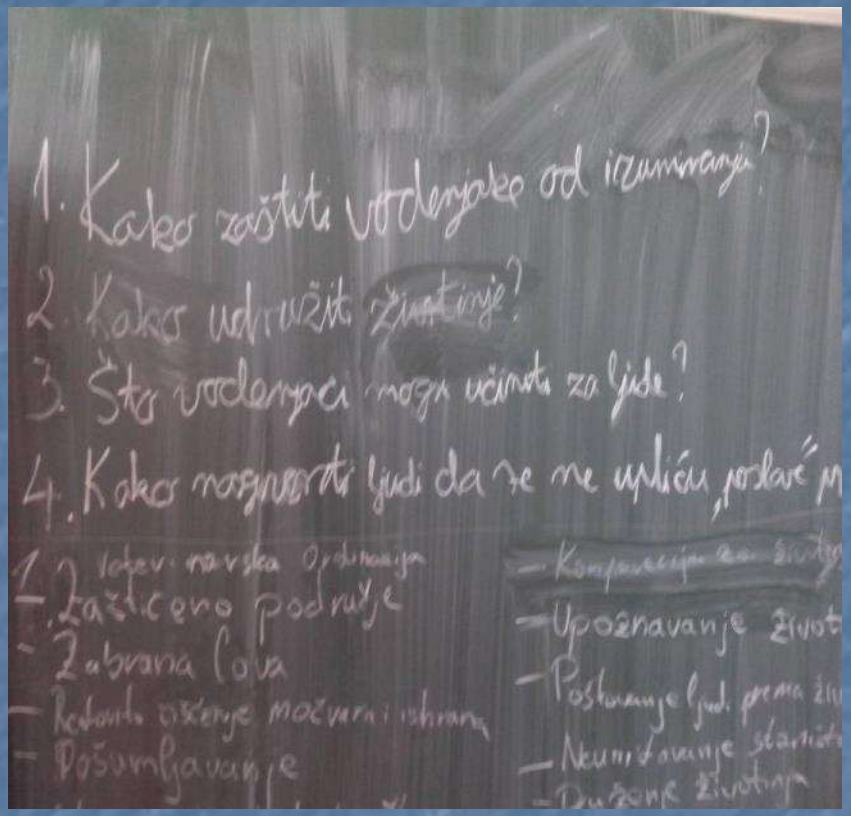
- The students were divided into four groups.

  Each group reflects and discusses one problem. They suggest possible ways of problem solving. They present their conclusions to the group.

- Students' works:

1. How to protect the newts from extinction?

- cleaning the swamp of waste produced by people
- planting new trees so that the animals have enough food
- creating a protected habitat for newt until their species is not renewed
- prohibiting the fishing of newts
- arranging veterinary clinic for newt



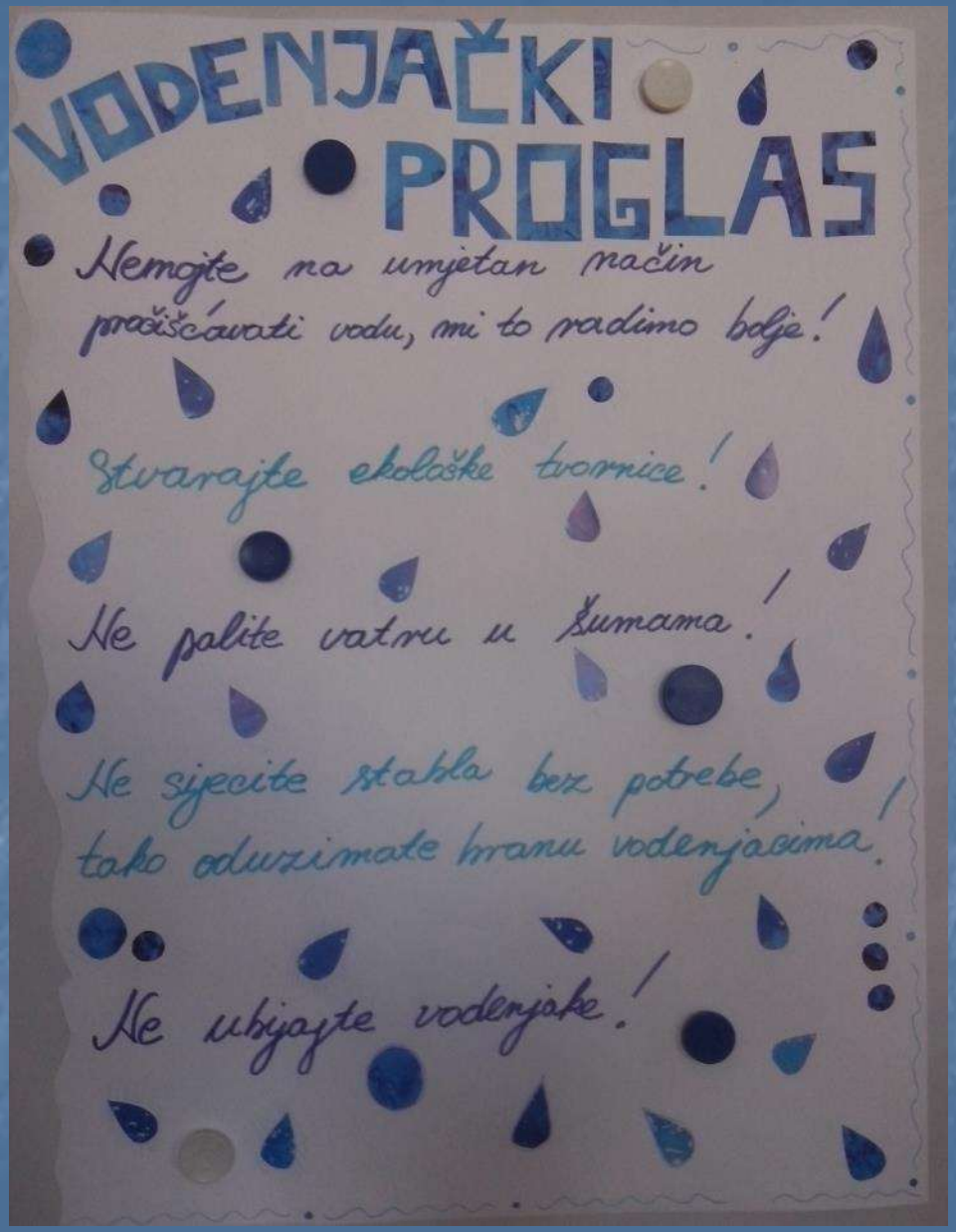
- *2. What can newts do for people?*

  - purify the water
  - heal the trees by eating crust
  - regulate the rivers level and defend human settlements from floods
  - change relief
  - produce fertile ground
  - turn water into healing wather

11. Making newt rules

- After discussing all the problems, students agreed on the proclamation that would be presented to people at the large annual conference on nature protection.

- Students' work:



12. Storytelling

- Students reflect on the events that will follow after people accept newts' rules.

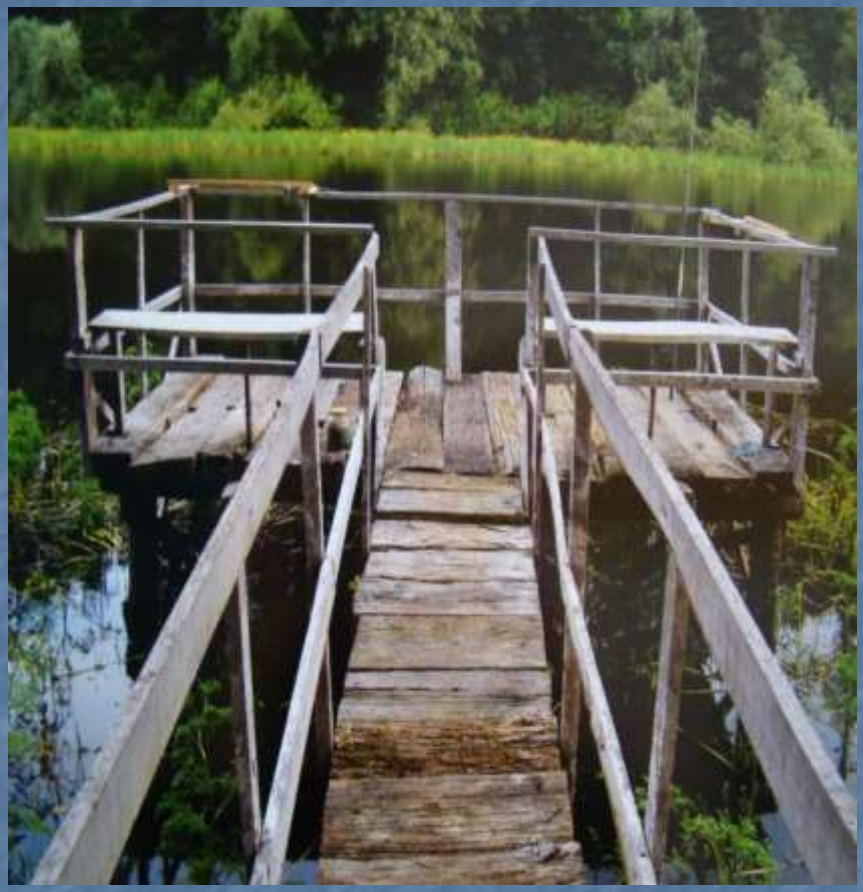
  What is changed in people's lives? Do people follow the rules? How will that affect lives of the newts?

Students' works:

People have decided to follow our rules to preserve our species. We have become a protected species, and our habitats are declared protected areas. Swamps are wooded and cleaned, full of tall trees with thick crust. We respect people and thank them every day by purifying water for them.

2. After ten years the woods are full of newts. You can't hear sawing wood. The villages are at least three kilometers away from our homes. Only you can hear is birds chirping and the murmur of the river. The hydro power plant is not built. We live peacefully in our river and woods. We made agreement with the people: we will purify water if they don't cut down our trees. Now they have to pay high heating bills, but they have very healthy water.

3. Ten years ago, we signed an agreement with people. But it is not fully respected. People did not benefit from the newts, and they wanted something in return. So they asked newts to entertain park visitors. The newts agreed, and the number of visitors significantly increased. Since then newts have all the rights, but they also have responsibilities. Entertaining visitors is an easy job - they just have to play and swim.



13. Analyzing and evaluating the project

- Talking with students we discover what they have learned and how they felt while working on the project.

MUSIC & WATER

„...thousand drops of water in a glass
create music
and cheer up our hearts... "

Objective:

To explore and discover the possibilities of musical experience and expression in everyday reality and the local environment

Tasks:

- to distinguish sounds, noises and tones creating them with percussions, glasses of water, flute and keyboards;
- to adopt a new musical contents

DIDACTIC SCENARIO

1. INTRODUCTION (MOTIVATION FOR RESEARCH)

Water is condition of overall survival of flora and fauna.

Everything around us is flowing (river), falling (rain), murmurs (stream)... Water introduces us to the magical world of its sound in nature, and when we capture it in a glass we can create a melody.

PREPARING FOR RESEARCH

Uneven amount of water is poured in the glasses.

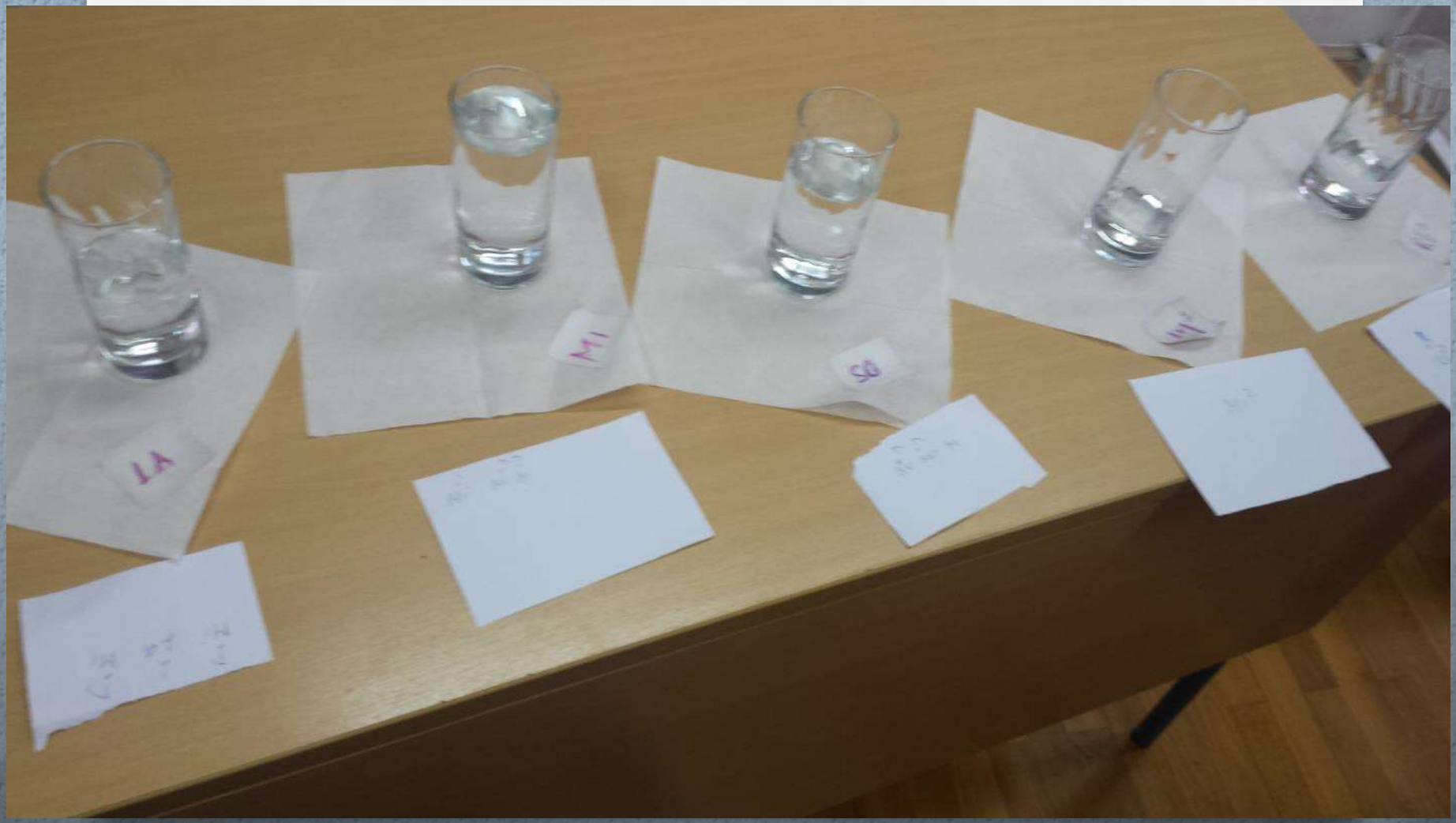
We use wooden stick to hit each glass.

We seek approximate pitch on keyboard.


Intervali tonovi
MI, FA, SO, LA, TI
SO FA FA TITITI LA SO

After finding the appropriate tone, we write it down.

We use the sticker to mark the tone.



CENTRAL PART – MUSIC CREATIVITY

The tones obtained will be incorporated in a melody (following the rules)

Composed melody is played on the glass cups, block flute and keyboard.


HI FA SO SO LA SO FA FA
HI FA SO SO LA SO FA FA TITI

FINAL PART - CONCLUSION

- Water allowed us to make music by handy means (glass cups, water, wooden sticks)
- Music is everywhere around us, but primarily inside us. Musical knowledge allows us to efficiently express our musical experience and our feelings.
- We can apply the knowledge gained in different circumstances

MEDIEVAL SETTLEMENT *STRAŽEVNIK* - WATER SUPPLY OF POPULATION

Branch school GORNJI HUMAC

2014./15.

Results of previous research work:

In the area between Pražnica and Gornji Humac there was a settlement called Straževnik in the Middle Ages.

A puddle *Glogovica* was a major "source" of drinking water for Straževnik residents.

RESEARACH TASK

To measure the amount of water in a puddle Glogovica. Based on this, to determine whether the amount of water was enough for drinking and cooking.

RESEARCH WORK ITINERARY

1. Creating and presenting ideas for calculating the amount of water in a puddle
2. Analysis of ideas and selection of the best solution
3. Field research: data collection
4. Classroom research: data processing and setting up new insights
5. Practical work: creating a model of the puddle in the given scale
6. Measuring the water in the model
7. Calculating the amount of water in a puddle Glogovica

1. PRESENTING IDEAS

2. ANALYSING IDEAS AND SELECTING THE BEST SOLUTION

ACCEPTED PROPOSAL:

We will calculate the amount of water according to the model of puddle

This is feasible and we have the necessary mathematical skills.

3. FIELD RESEARCH

OBJECTIVE: To collect the data necessary to create model of puddle

KNOWLEDGE AND SKILLS REQUIRED:

- orientation in space
- the use of the compass
- constructing rectangular grid
- measuring length using standard units
- handling construction meter
- logging activities and work results using words, drawings and photography

3.1. constructing rectangular grid

3.2. Measuring the length, width, depth ...

3.3. Recording data

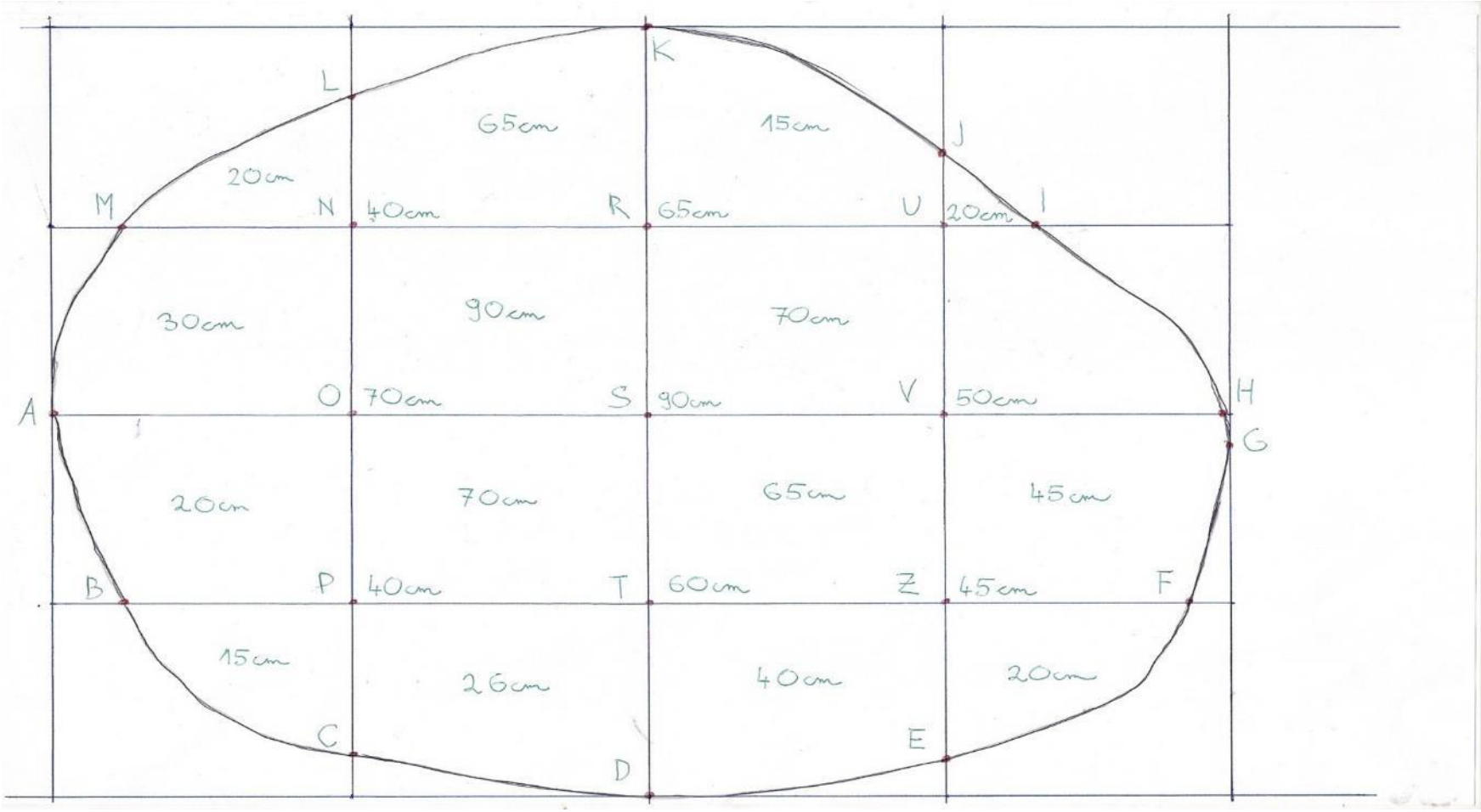
4. DATA PROCESSING

OBJECTIVE: sketching puddle in scale 1:75 and calculating the puddle surface

KNOWLEDGE AND SKILLS REQUIRED :

- method of reducing of the measured length
- division of numbers
- drawing angles and the rectangle
- displaying relief (underwater relief) on a flat surface
- calculating the surface of a rectangle
- the process of enlarging geographic content

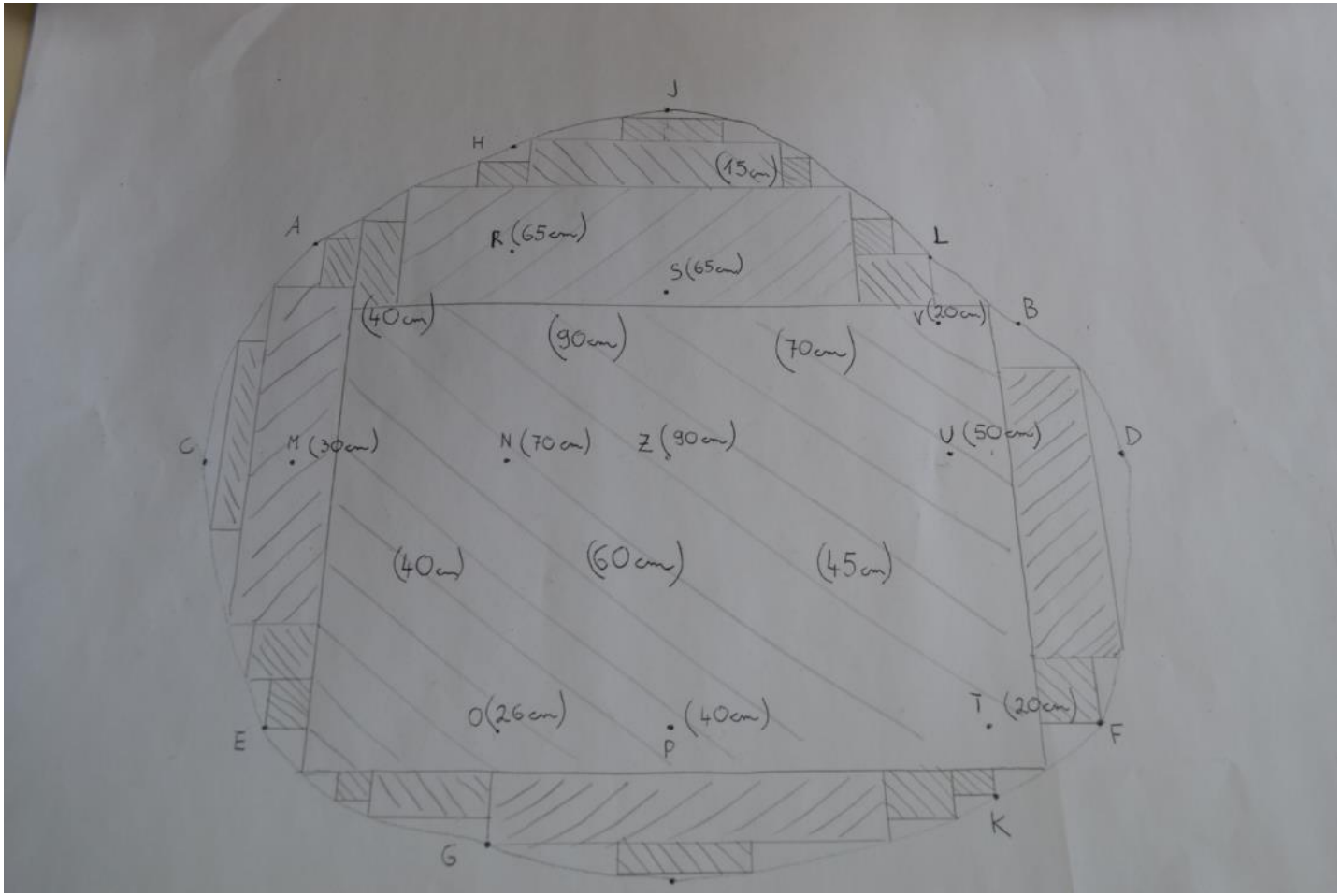
4.1. Making the sketch of the puddle



4.2. Displaying underwater relief

4.3. Calculating the surface of the sketch

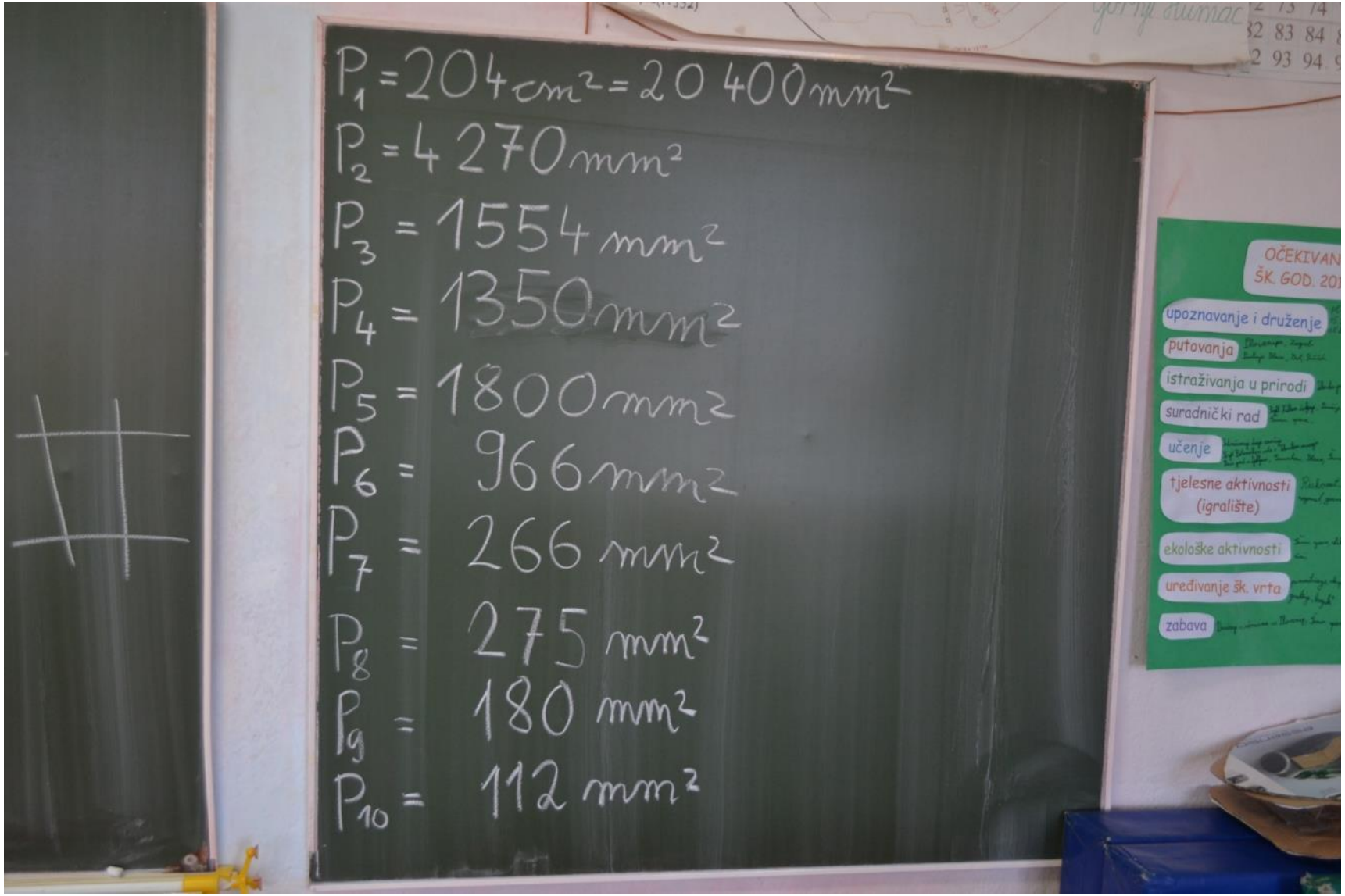
Irregular figure is divided into rectangles and squares, whose surfaces we can calculate



We cut undivided parts of the figure…

… and put it in the square

We calculate the surface of the sketch: P = 35 378mm²



4.4. The calculation of the puddle surface in the nature

PROBLEM TASK:

How to calculate the real surface using the surface of the sketch of the puddle?

KNOWLEDGE AND SKILLS REQUIRED:

- procedure of increasing the length according to given scale (ratio)
- square: sides, angles and surfaces
- arithmetic operation of multiplication

The process of enlarging geographic map contents: the length and the surface of the figure

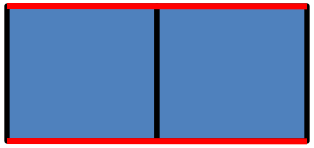
1. **enlarging the length (1 : 2)**

map reality

_____ _____

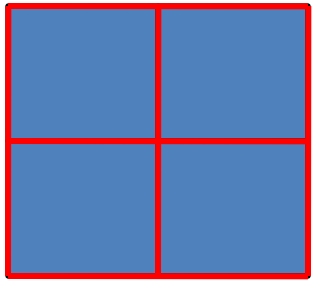
2. **enlarging the surface (1 : 2)**

map



After 1st enlargement

reality



After 2nd enlargement

CONCLUSION:

We have to implement the enlargement process **twice** to calculate the real surface of the figure.

5. MAKING THE SKETCH OF THE PUDDLE

SCALE 1:75

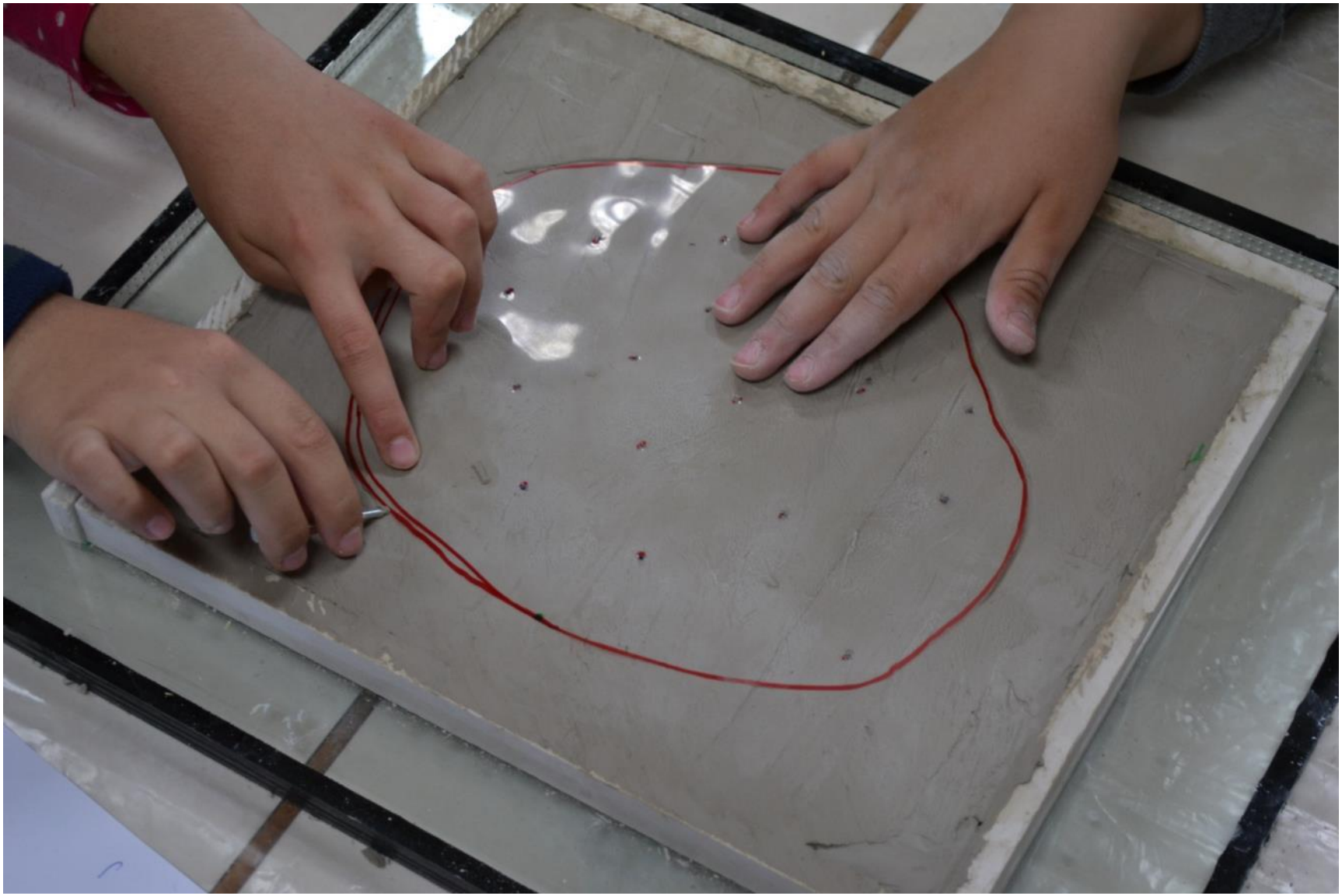
KNOWLEDGE AND SKILLS REQUIRED:

- method of reducing the length
- arithmetic operation division
- measuring length
- working with clay

5.1. Forming a flat surface in confined surface

The result of step 1

5.2. Grooving coastline …



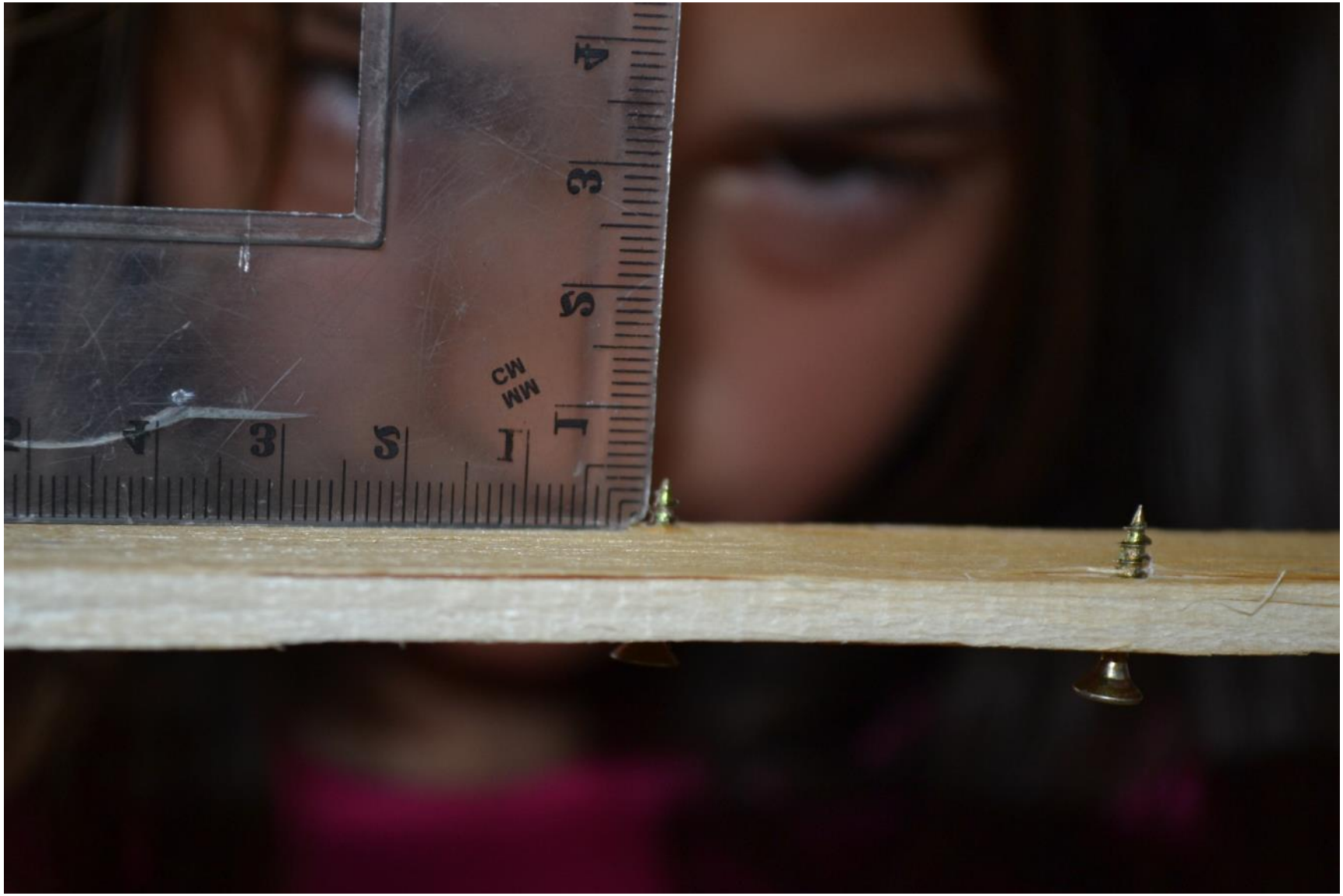
… marking points with measured depths

The result of step 2

5.3. Creating a depth sounder

The tops of the screws must be equal to reduced puddle depth

Checking



5.4. Forming underwater relief

Carving the depth points

Fine shaping of the underwater relief

Checking the depth points

The result of step 3

6. MEASURING THE WATER IN THE PUDDLE MODEL

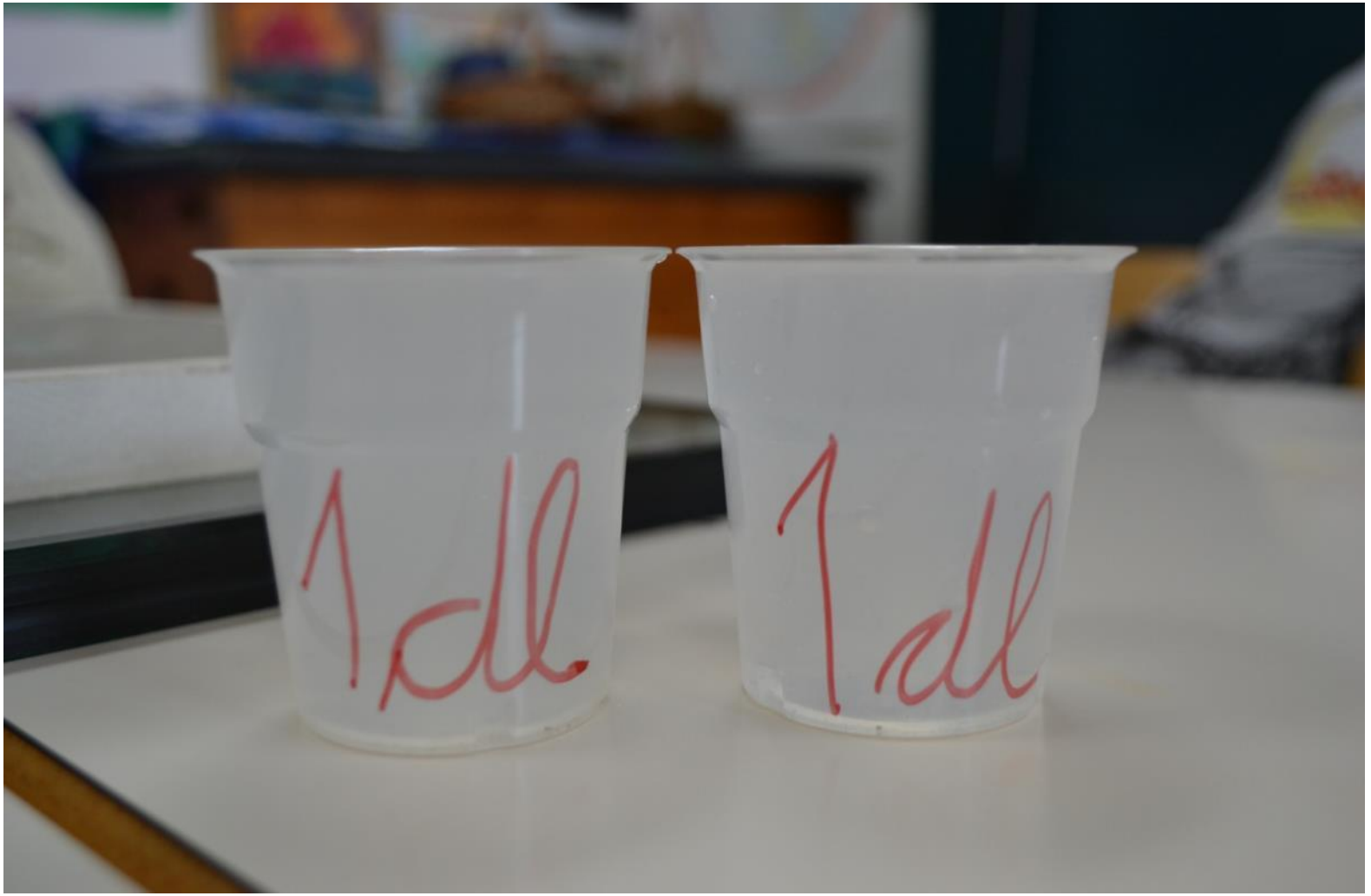
KNOWLEDGE AND SKILLS REQUIRED:

- procedure of measuring the quantity of water
- measure units for the quantity of water

6.1. Filling the model with water

6.2. Emptying the puddle model and filling the model for the quantity of fluid: dl -1

6.3. the result



The amount of water in the puddle model is 2 dl.

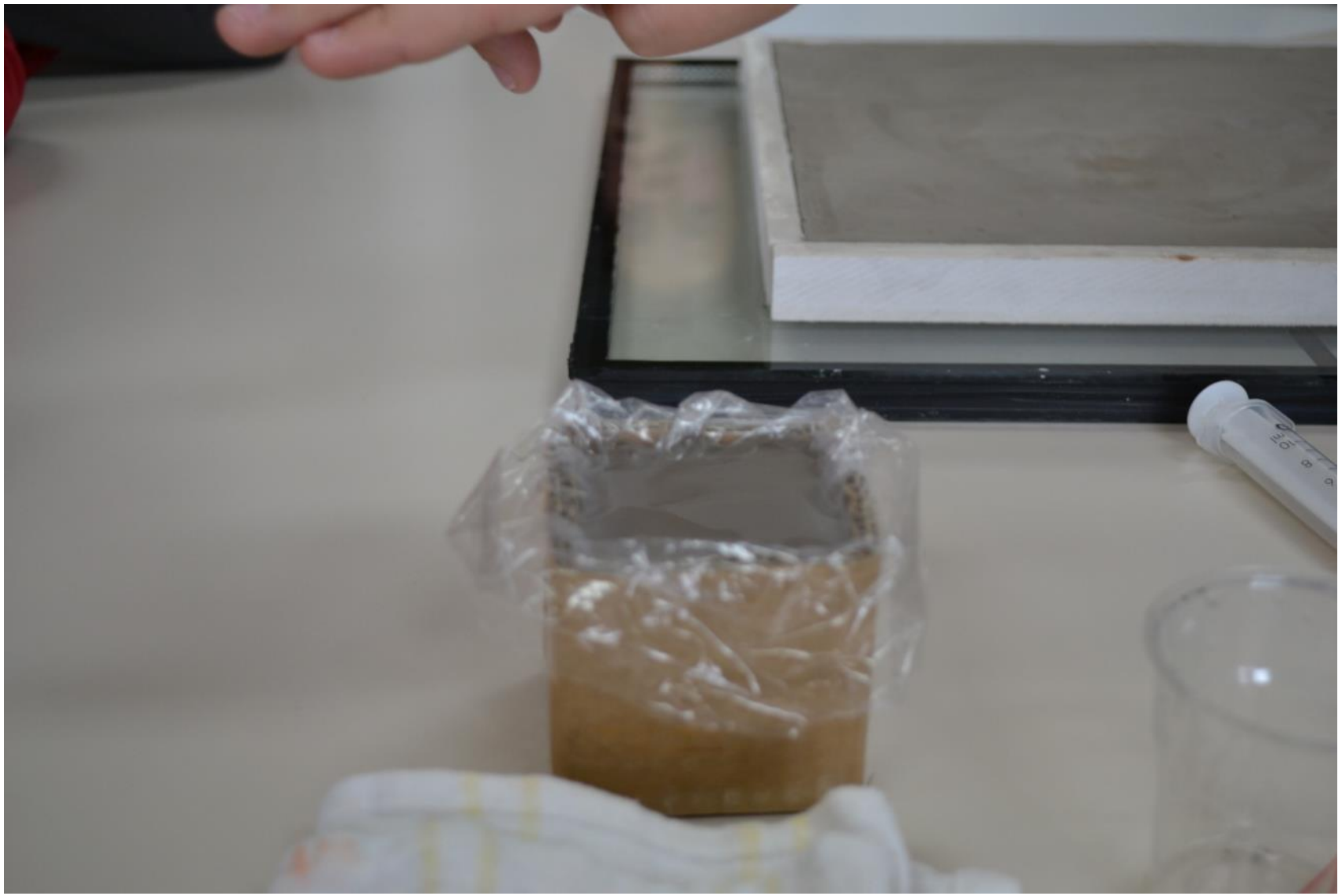
7. Calculation of the amount of water in Glogovica puddle (in reality)

KNOWLEDGE AND SKILLS REQUIRED:

- geometrical shapes, cube
- enlargement procedure for the geographical map units (the length and surface of the figure)
- multiplication of numbers
- measure units for the fluid quantity

7.1. Changing the shape of water, the quantity remains the same

The water has cubic shape now, which will make enlargement procedure easier



7.2. Enlarging space

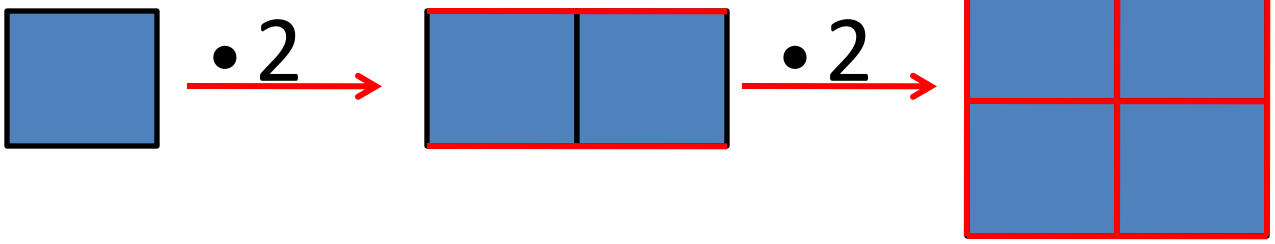
We learned so far:

1. **enlarging the length (1 : 2)**

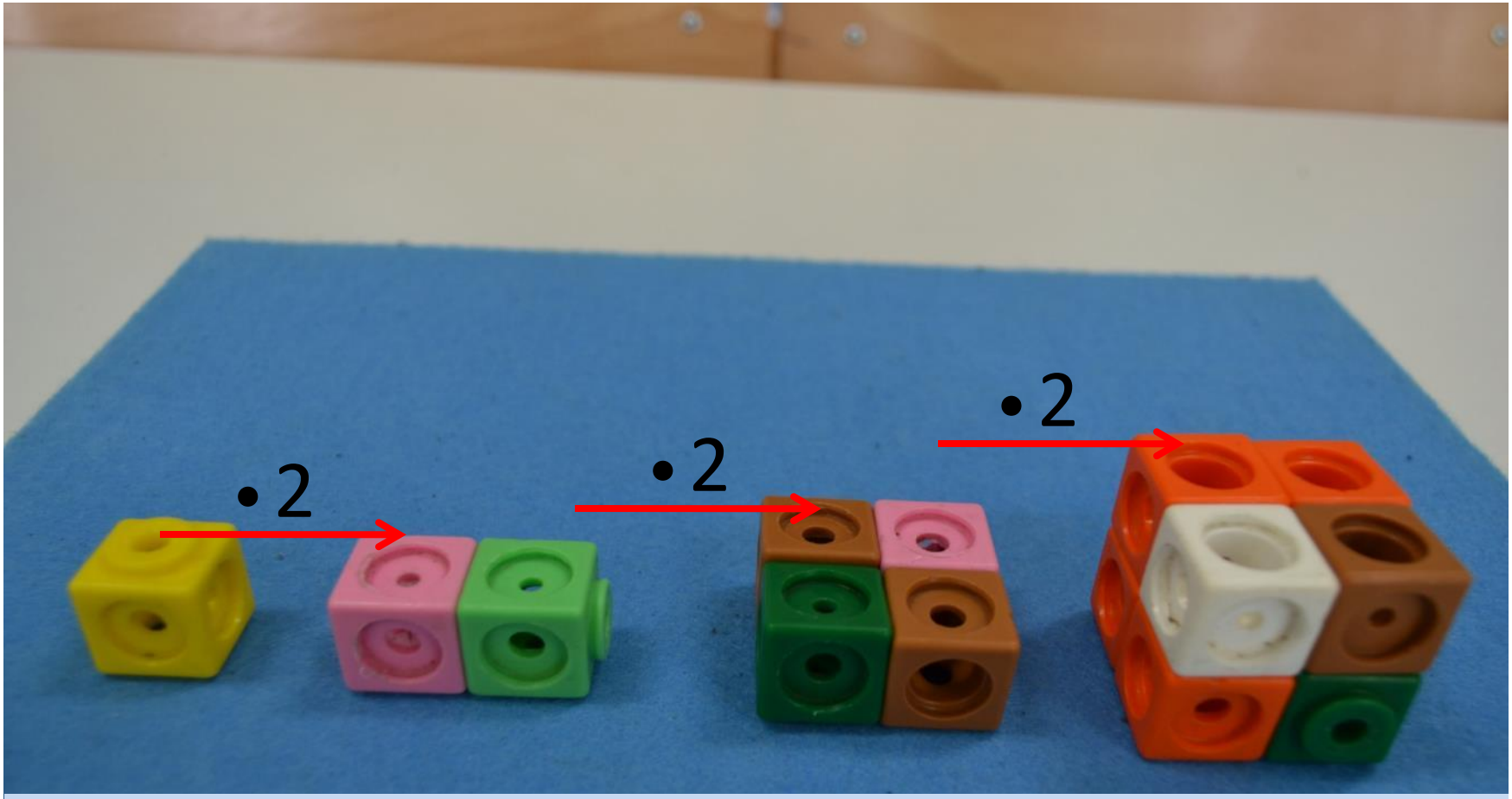
map reality

2. **enlarging the surface** (1 : 2)

map reality



What must we do to enlarge the figure 2 times?



CONCLUSION:

The process of enlargement we must implement 3 times in order to enlarge the figure 2 times.

Since our water has the shape of cube now, it is possible to apply the same procedure for enlarging the amount of liquid.

the model of puddle scale **1 : 75**

amount of water in the model → process of enlargement → amount of water in reality

2dl $\xrightarrow{\bullet 75}$ **150dl** $\xrightarrow{\bullet 75}$ **11 250dl** $\xrightarrow{\bullet 75}$ **843 750dl**

843 750dl = 84 375l

CONCLUSION

We have gained conceptual knowledge about the square and cubic units of measurement.

Using theoretical, empirical and intuitive knowledge, we determined the current amount of water in Glogovica.

This amount was not enough to supply the people in the village. However, people were living there and using water from puddle.

Reasonable assumption: the pool haven't been cleaned for a long time and its volume is reduced – before there was more water in the puddle.

New research question: How can we use the data collected on further research work (life in medieval Straževnik)?

WATER

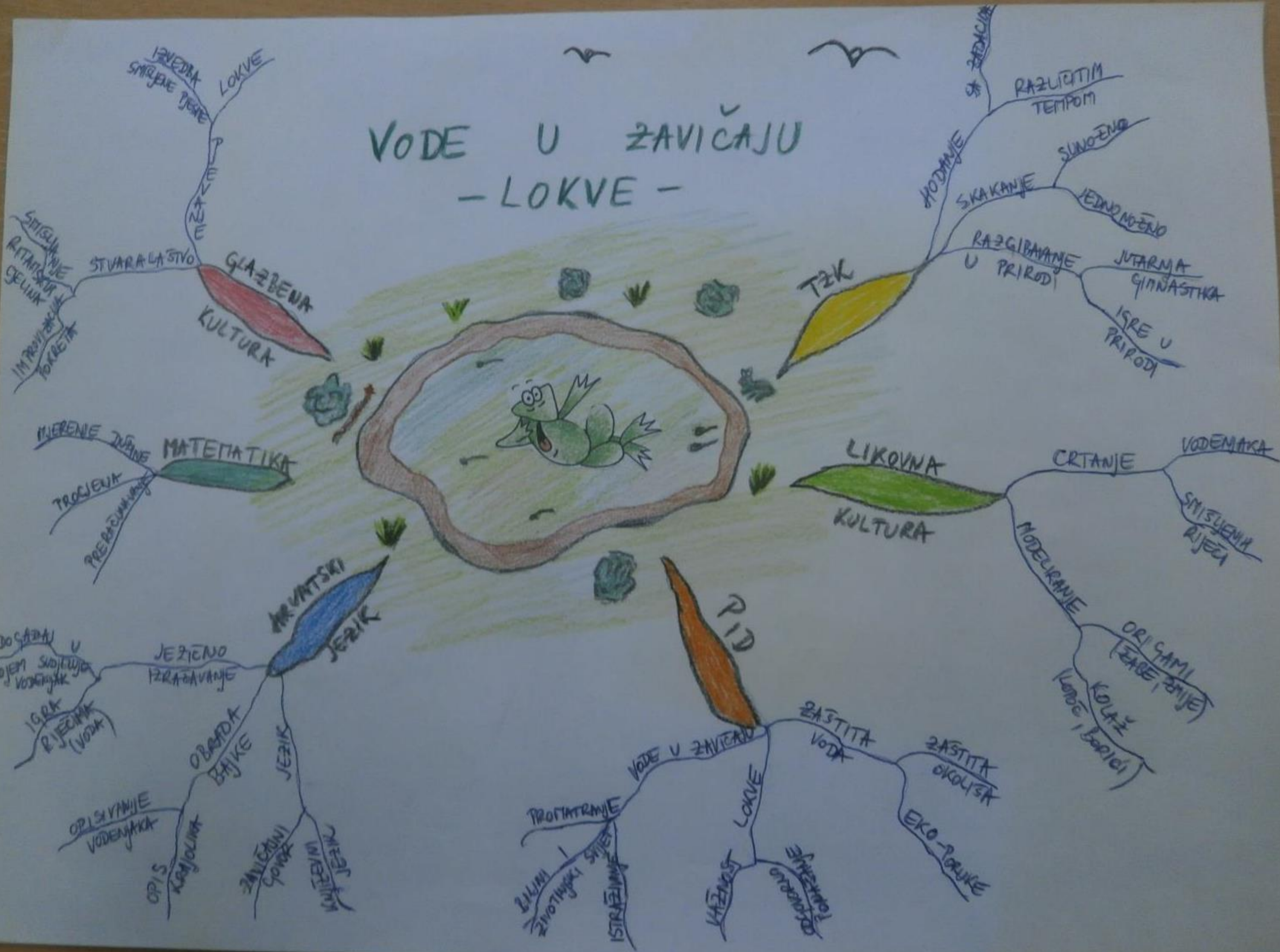
3rd grade

ELEMENTARY SCHOOL PUČIŠĆA

2014/15

OBJECTIVES

- To experience the purpose of learning: linking content with concrete and everyday life situations.
- To understand the importance of water for the flora and fauna of the homeland
- To activate in the life of the community as a responsible citizen (practically express relationship with water)
- To increase the motivation for learning



VODE U ZAVIČAJU
- LOKVE -
GLAZBENA KULTURA
STVARALAŠTVO
PJEVANJE
IZVEDBA SMIRJENE PJESME
LOKVE
RITAM
IMPROVIZACIJA
TZK
HODANJE
RAZLIČITIM TEMPOM
SKAKANJE
SUNOŽNO
JEDNONOŽNO
RAZGIBAVANJE U PRIRODI
JUTARNJA GIMNASTIKA
IGRE U PRIRODI
MATEMATIKA
MJERENJE DUŽINE
PROCJENA
PRERAČUNAVANJE
LIKOVNA KULTURA
CRTANJE
VODENJAKA
SMISLJENIH RIJEČI
MODELIRANJE
ORIGAMI (ŽABE, ZMIJE)
KOLAŽ
HRVATSKI JEZIK
JEZIČNO IZRAŽAVANJE
IGRA RIJEČIMA (VODA)
OBRADA BAJKE
OPISIVANJE VODENJAKA
OPIS KRAJOLIKA
JEZIK
ZAVIČAJNI GOVOR
KNJIŽEVNI JEZIK
PID
VODE U ZAVIČAJU
PROMATRANJE
BILJNI I ŽIVOTINJSKI SVIJET
ISTRAŽIVANJE
LOKVE
VAŽNOST
ZAŠTITA VODA
ZAŠTITA OKOLIŠA
EKO-PORUKE

Water in the Homeland
-Puddles-

NATURE

TEACHING TOPICS:

- The water in the homeland
- The significance of water for the living beings
- The economy and the quality of the environment

Expected outcomes:

- To distinguish waters in the homeland
- To get to know and identify wildlife in those waters
- To understand the impact of human on pollution, and to propose measures for the protection of environment

Visiting Bliznice

Preparing for the research

Research questions:

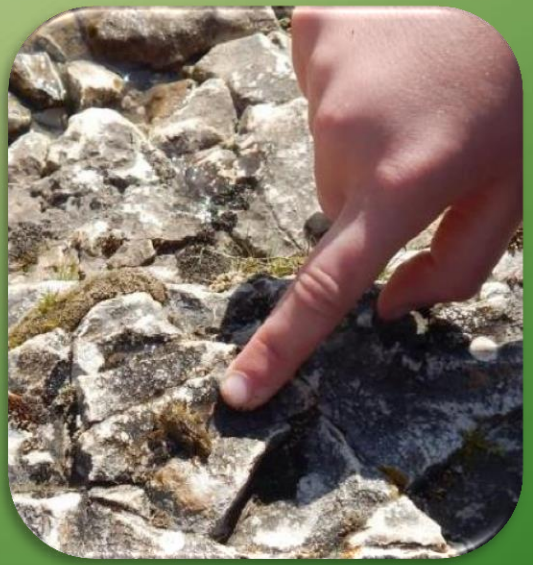
- How does the puddle occure?

- Why isn’t the water absorbed in the ground or evaporated in the air?

- What can be the purpose of the puddles?
- How can we preserve them?

Who lives in puddles?

We met some residents!
And found some answers.



MOTHER TONGUE

TEACHING TOPICS:

- Fairy tale (Bajka o vodenjacima, K. Čapek)
- Creating stories
- Illustrating stories
- The appearance and behavior of the character
- Making new words

EXPECTED OUTCOMES:

- To realize the reception of literary message, to determine the basic characteristics of the character and his behavior, to create a story, to create new (ludic) words and suggest their meaning

Reading / listening “Bajku o vodenjacima” (K. Čapek).

Responding to the literary work: writing creativity

ZABAVNE PUSTOLOVINE MALOG VODENJAKA

Bio jednom jedan vodenjak po imenu Vini. Živio je u Supetru. Bio je jako malen. Tog dana u Supetru je padala velika kiša i puhala je bura. Vini je šetao po stepenicama, poskliznuo se i poletio u more. Doplivao je do pučiške uvale. Tu mu se jako svidjelo pa je odlučio da će to pokazati prijateljima i ako se i njima svidi da će ostati tu živjeti i upoznati još više prijatelja. Tako je Vini otišao plivajući po prijatelje u Supetar. Došao je i rekao im da idu u novi dom. Pristali su. Vini ih je odveo do pučiške uvale. Oni su se iznenadili i rekli: „Kakva divota!“. Počeli su se igrati u moru. Upoznali su raka Antu, ribu Đurđicu i još neke prijatelje. Kad je u Pučišćima počela padati kiša i puhati bura bila je to prava pustolovina. Spuštali su se niz štrade i gađali se kamenčićima. I tako su vam završile pustolovine malog vodenjaka.

Antonia Martinić

NAJVESELIJI VODENJAK

U Pučišćima je živio jedan vodenjak po imenu Marin. Bio je jako veseo i ništa ga nije moglo rastužiti, osim jedne stvari. Tu stvar nitko ne voli. To je samoća. On, koliko je bio sretan, toliko je bio i tužan. Marin je imao prijatelje, ali daleko, daleko. I njemu su se svidjela Pučišća kao mnogima. Nažalost, svi su se odselili zbog bure. Naravno, svi znaju pučišku buru. Vodenjacima nije smetala bura, zapravo su je voljeli kao i valove koje je stvarala, ali nisu voljeli njene posljedice kao što su grane i smeće u moru.

Marinu bura nije smetala jer mu je bila prijateljica. Marin je pitao buru hoće li se igrati s njim. Rekao joj je da pozove svoju prijateljicu kišu, a da će on pozvati svoje prijatelje vodenjake. Bura je pristala. Tako su se cijeli tjedan igrali. Vodenjaci su se sprijateljili s burom i kišom. Štrade su im bile tobogani, s krovova na kamenin kućama su skakali u prekrasno more, a po cesti su klizili i utrkivali se. Igrali su se i skrivača. Marin je u toj igri bio najbolji jer je imao najbolje mjesto za skrivanje. To je bilo između stijena na kamenim kućama. Poslije igre je bura napravila velike valove i iz mora izbacila grane i smeće. Marinovi prijatelji su bili zadivljeni. Proširila se vijest o tome kako je u Pučišćima predivno more i kako je jako zabavno. Puno se vodenjaka preselilo u Pučišća. Marin je upoznao mnogo prijatelja. I od tada je on bio najveseliji vodenjak.

Franka Mihaić

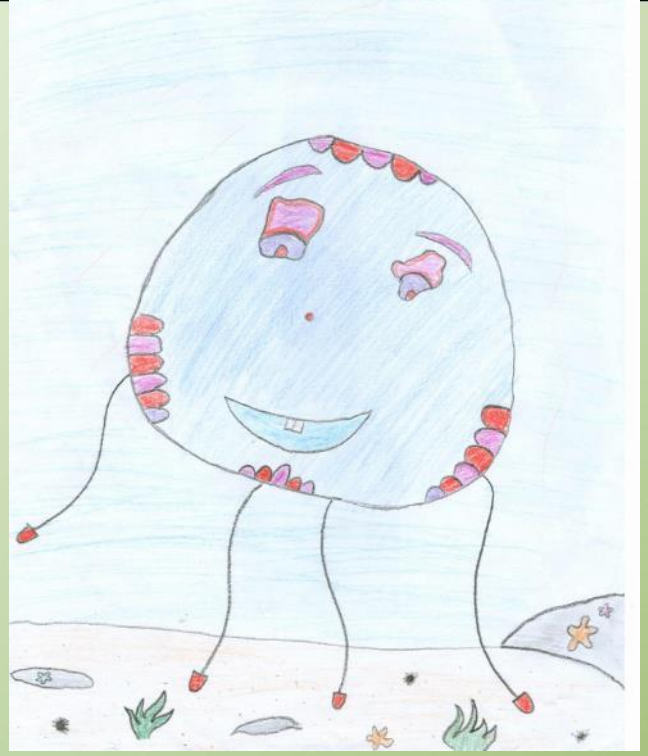
PUSTOLOVINE MALOG VODENJAKA

U mom mjestu na lanterni živi jedan vodenjak. Malo tko ga je vidio jer je on sramežljiv. Po noći on pali svijeću na lanterni da bi se mornari i ribari mogli orijentirati. Kad ljudi dođu, on nestane kao magla. Ako lovi ribu brzo skoči u more i zaroni u nepoznato, a kada je oko kuće onda se brzo sakrije u kuću i nikoga ne pušta unutra. Nakon nekog vremena se sprijateljio s ljudima.

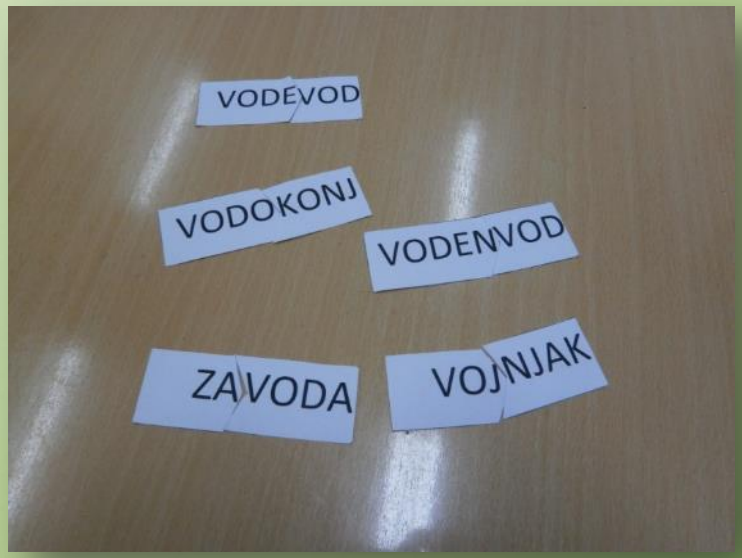
Angela Kaštelan

Illustrations of our creative works!


I'M
HAPPY



Lexical creativity stimulated by the poem"What can be made of water" (Z. Balog)


VODEVOD
VODOKONJ
VODENVOD
ZAVODA
VOJNJAK

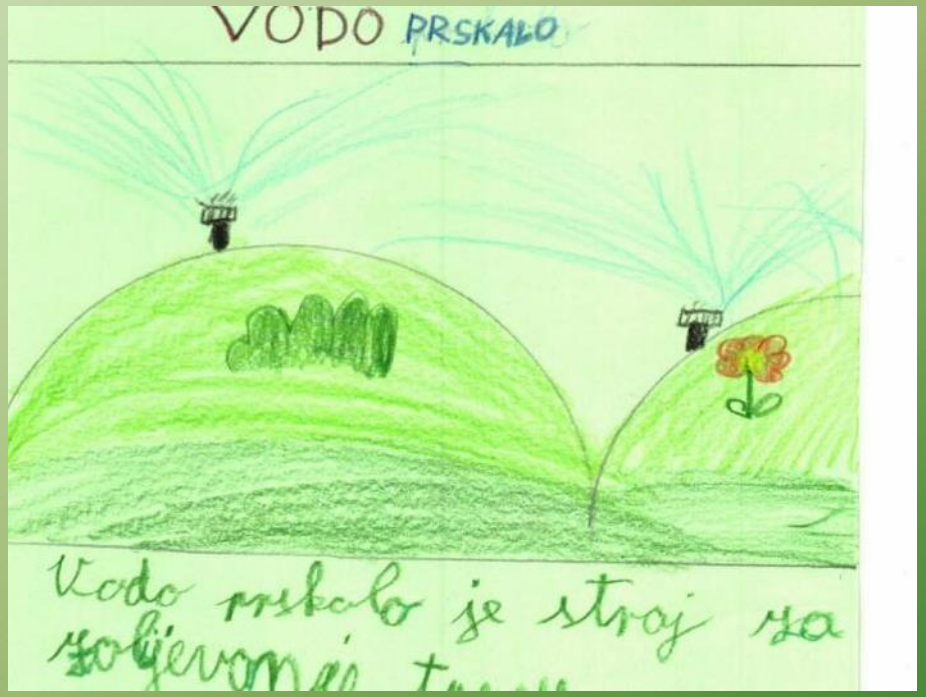

VODEN VODA
VODO NJAK
ZA VOJ
KONJ VOD
VODE VOD

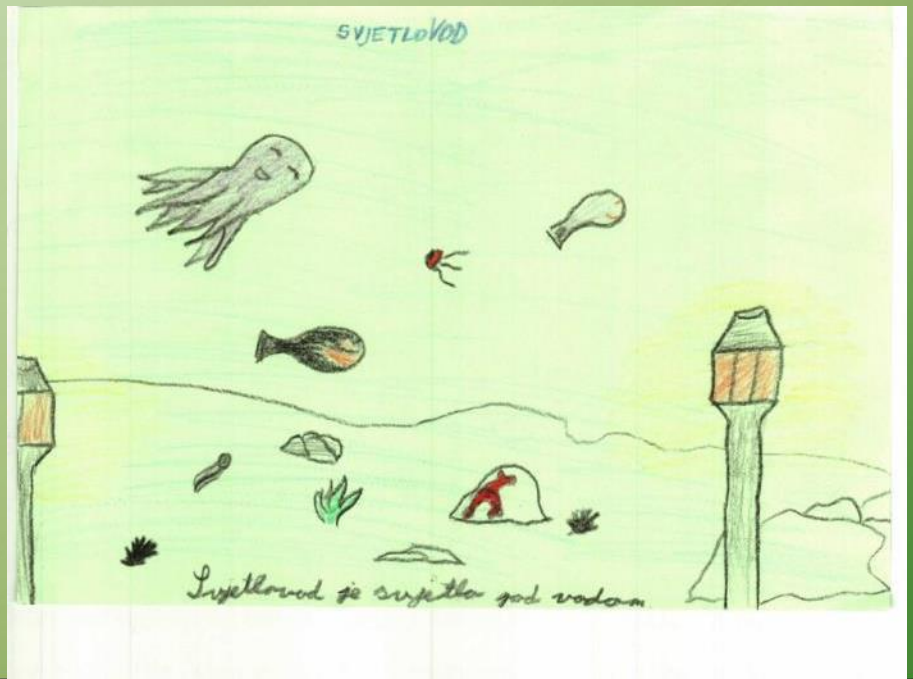

VODO VODEN
VODENVODA
VODNJAK
ZA VOJ
VOD KONJ

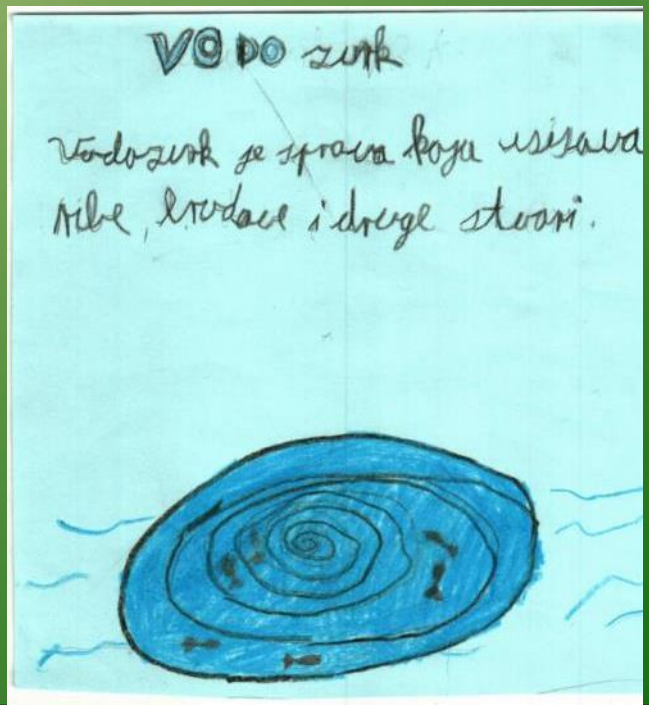
The results

We created a DICTIONARY OF MAGICAL CONCEPTS OF WATER


VODOSKOP
VODOSKOP JE NAPRAVA ZA TRAŽENJE IZGUBLJENIH RIBA.


VODO PRSKALO
Vodo prskalo je stroj za

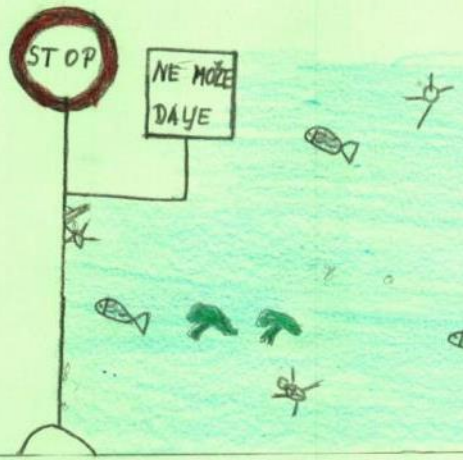

SVJETLOVOD
Svjetlovod je svjetlo pod vodom


VODO zvrk
Vodozvrk je sprava koja usisava ribe, krokodile i druge stvari.

VODO ZVRK

VODOZVRK je kad je tornado u vodi.

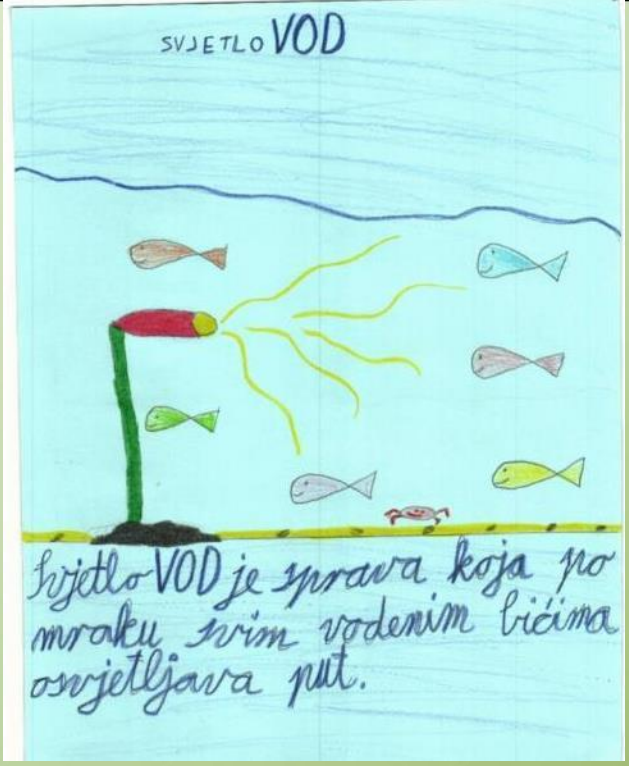
VODO STOPI

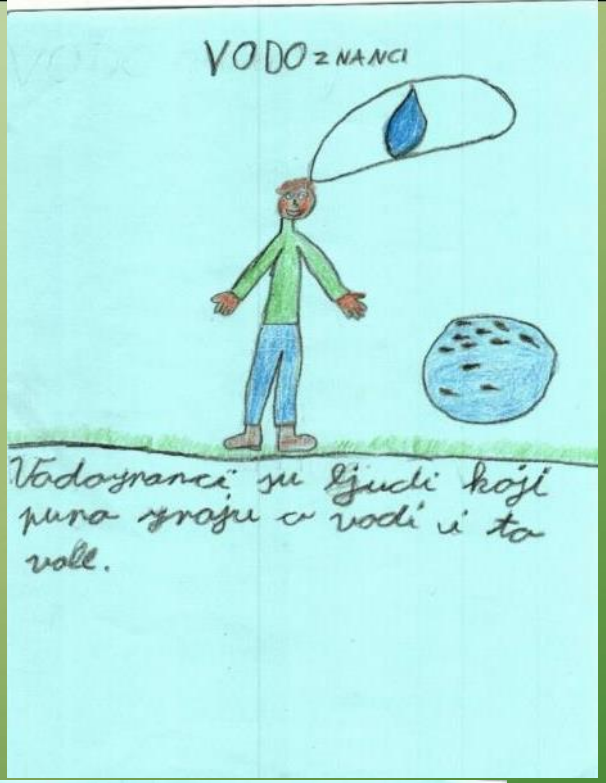


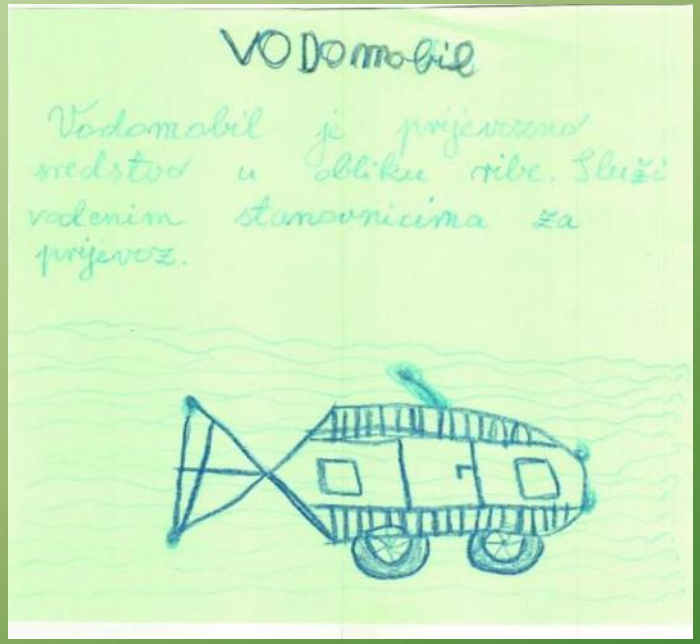
VODOSTOP JE ZNAK ZA OBAVEZNO ZAUSTAVLJANJE U VODI.

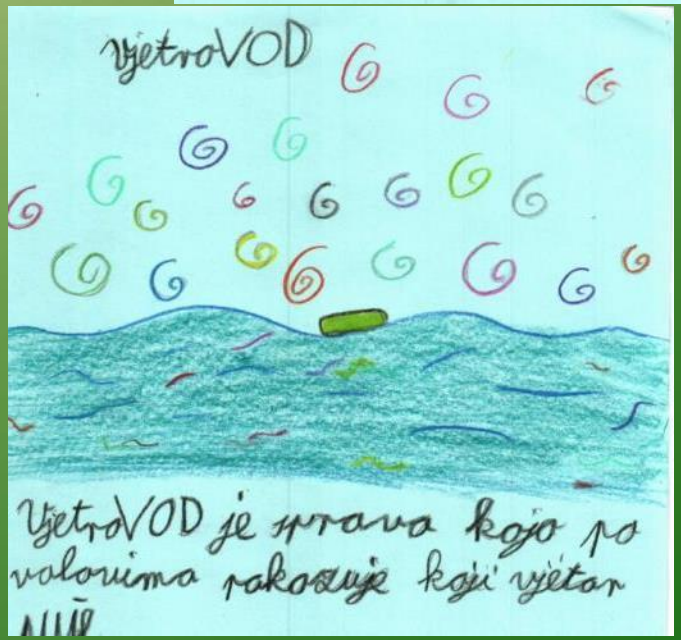
VODO ZNANAC

VODO ZNANAC je čovjek koji zna sve o vodi.

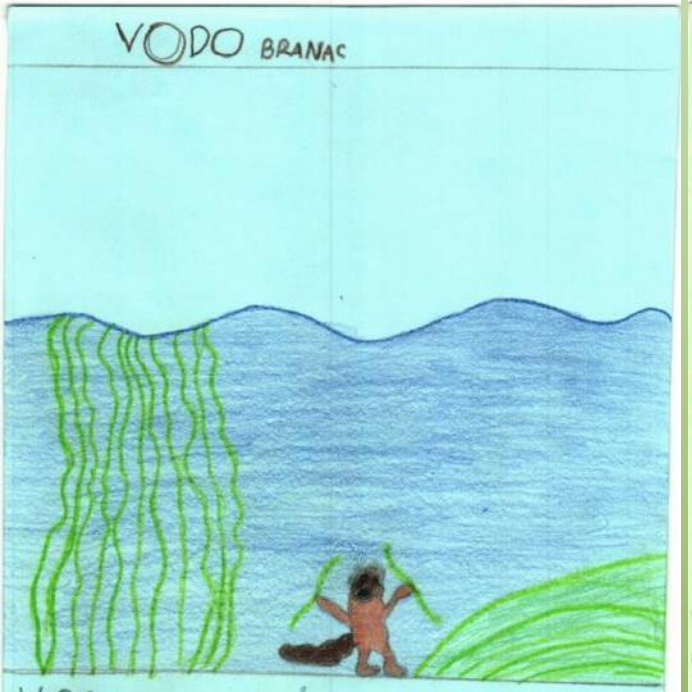

SVJETLO VOD
Svjetlo VOD je sprava koja po mraku svim vodenim bićima osvjetljava put.


VODOZNANCI
Vodoznanci su ljudi koji puno znaju o vodi i to volle.


VODOmobil
Vodomobil je prijevozno sredstvo u obliku ribe. Služi vodenim stanovnicima za prijevoz.


VjetroVOD
VjetroVOD je sprava koja po valovima pokreće koji vjetar

VODO BRANAC



VODO BRANAC je životinja koja gradi brane da se ona čije je blo u moru.

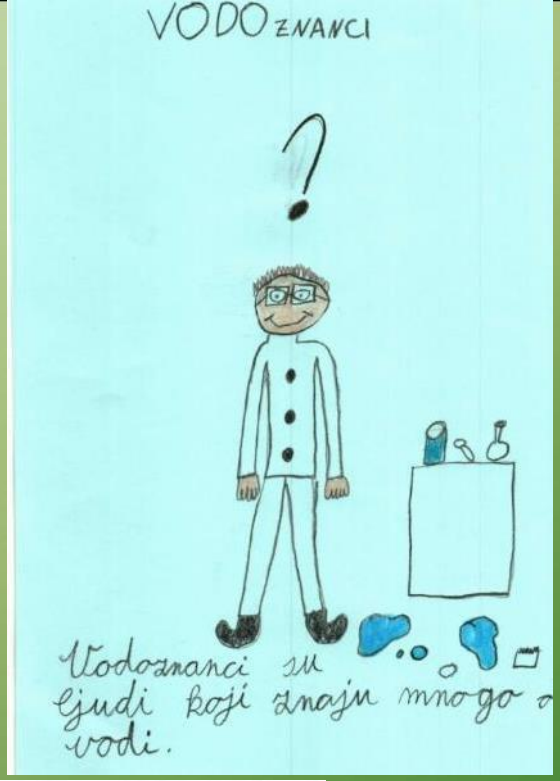
RatoVOD

RatoVOD je igra s vodom. Može se igrati s vodenim balonima i pištoljima na vodu.

VODO ZNANCI

VODO ZNANCI su ljudi koji se znaju u vodo ma i, drugima prepričavaju.

Ključovod je kad voda na štednjaku počne ključati.



Vodoznanci su ljudi koji znaju mnogo o vodi.

Svjetlovod je podvodni svjetionik.

MATHS

Teaching topics:

- Assessing the length in nature
- Measuring the length

Expected outcomes:

- To assess the length, to measure the length, to convert the measuring units for length

Assessing and measuring length

- In the nature…

… and in the clasroom

PHYSICAL EDUCATION

Teaching topics:

- Walking at a different pace
- Climbing in nature
- Skipping rope
- Outdoor games

Expected outcomes:

- To develop the basic motoric skills - walking, running, skipping, jumping …

Enjoying and exercising in nature!

We imitate the movements of nature…

…also in the school

ARTS

Teachimg topics:

- The volume in space (origamitechnique)
- Surface

Expected outcomes:

- To notice and to express the balance in space, visually express the surface, express through the tonal painting

origami


ISUS USKR-

kolaž

A puddle we imagine...

MUSIC

Taching topics:

- Elements of musical creativity (improvisation- melodies, movement)

Expected outcomes:

- To improvise and perform small melodic units by voice and gesture

Group work: creating the lyrics ...

…that we set to music and sung!

CONCLUSION

We achieved the planned objectives in cross-curricular work:

1. We were entertained at every stage of learning
2. We mastered anticipated teaching tasks easily
3. We will permanently remembere the contents we learned e d (connected with the topic of "water")
4. We realized the importance of the role in the plant and animal communities
5. As responsible members of the community, we will take care of the water, because – there is no life without water