Learning Tool Code	Title
SDG6-SDGfP	**WE LEARN ABOUT WATER WITH FACTS AND FIGURES**

Objectives

• To consolidate students' knowledge of the properties of water, to identify the causes of water pollution, to expand the ideas about the protection of water from humans;

• Expanding children's ideas about the world around them through comparisons, comparisons,connecting meaningful and meaningful fragments of water.

• Consolidation and enrichment of knowledge about the main water pollutants and ways of protection. Improving teamwork skills and presentation of a finished product. Creating a group product through digital materials

Activity details

- Materials- Resources: Each group has mobile phones, a set of pre-prepared materials on the topic of the pre- set project, chemicals, sheets, etc.

Technological security: Windows environment with Microsoft Office (PowerPoint), laptop, big screen, mobile phones.

- Duration – 60 minutes
- Number of groups - several groups of students - (5th grade, ages 11-12)

Instructions

Students are given homework on a project in advance. In the form of a short text, answer the questions:

1) Water is unique because ...
2) Water is needed because ...
3) Water should be used wisely because ...
4) The water must be kept clean because ...
5) Illustrate the project with a picture.

Lesson plan:

1. Students present their pre-prepared projects. Each team nominates a representative who presents the finished project to the audience.
2. The teacher introduces the main topic: March 22 World Water Day.
3. The topic of the multidisciplinary lesson is set: "We learn about water with facts and figures."

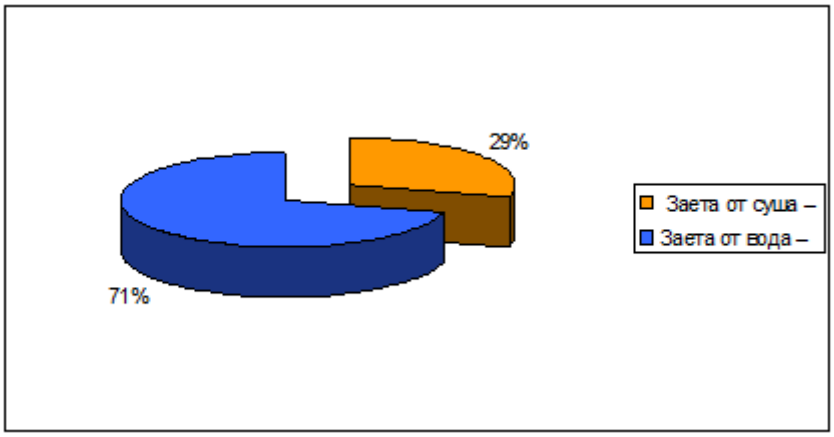
4. Recall the basic properties of water.
5. Working in groups - task: Give examples of three substances that dissolve and three substances that do not dissolve in water.
Emphasis is placed on the meaning and uniqueness of the property thermal conductivity.
6. The math teacher says that he has two favorite numbers - 0 and 100 and provokes the students to connect
other known properties of water through them.
7. The multimedia is assigned a picture of the globe from space. Students think about why blue is the predominant color in the picture.

Total area of the Earth - 510.2 million square kilometers		
Occupied by land - 149.0 million sq.km.	Occupied by water - 361.2 million sq. Km	Total 510.2 million sq. Km

With task 1: Express in percentage the water and the land. Round the percentages to an integer.
Task 2: How many times is the area occupied by water larger than the land area? (Round to the tenth). Students practice their knowledge of working with data set in a table, calculating a percentage and rounding a
decimal fraction.
Students are given homework: Based on the data given in the table, create a pie chart of the distribution of land and water on Earth.

Total area of the Earth - 510.2 million square kilometers	
Occupied by land - 149.0 million sq. Km	Occupied by water - 361.2 million sq. Km

Students are shown a sample pie chart of what their homework should look like. The distribution of water and land on the surface of the globe.



The distribution of water on the Earth's surface is then considered in the following table.

	mass million tons	Type of water %
World Ocean	142	Saltwater 97.5%
Rivers and lakes	0,05	Fresh water 2,5%
Glaciers	3,53	
Atmosphere	0,0013	

Through the data given in the table, the students come to the conclusion that a person needs fresh water and there is little fresh water on Earth.
Task 3: Spruce weighs 100 kg, of which 85% is water. How many kilograms is water?
Task 4: The salmon weighs 2 kg, of which 1 kg and 500 g is water. What percentage is water? Task 5: In granite, the water is about 0.5%. In a ton of granite, how many kilograms is water?
Tasks 3, 4 and 5, strengthen the students' knowledge related to the main tasks for finding a percentage. Also
from them the students understand that water is everywhere in the living and inanimate nature and reach this conclusion.
Protecting water from pollution is a policy not only of Bulgaria but also of the European Union.
Working in groups - Task: What are the sources of water pollution?
Students work in teams and finally summarize the sources of pollution with the teacher.
Next task 6: Oil is spilled on the surface of the water. The spill of oil on the surface of the water occupies a rectangular area. It is 26 meters long and 11 meters wide. Find the area of the oil slick.
Shows students with pictures how oil pollution affects the environment and animals. From a mathematical point of view, students find the face of a rectangle.

The lesson continues with a brainstorming session. How does water pollution harm:
- Plants
- The animals
- People

The students came to the conclusion that: Do not pollute the water! Dirty water kills all living organisms! Students are emphasized that polluted water contains many impurities that are harmful to humans. To prevent
unpleasant consequences, it is necessary to filter the water they drink. They watch a video that summarizes everything said so far in the lesson.
Then they summarize the following conclusion: Filter the water to be healthy!

Students are introduced to the concept of "virtual water" - A person consumes a huge amount of fresh water. The water used to produce agricultural or industrial goods is called 'virtual water', which is contained in the goods.
To receive:
1 ton of steel, you need 150 tons of water
250 tons of water are needed to produce 1 ton of paper
To make 1 cup of coffee, you need 140 liters of water.
To produce enough flour for one loaf (400 grams), you need 550 liters of water. The production of 1 liter of milk requires 1000 liters of water.
The production of 1 kilogram of rice requires 3000 liters of water
The production of 1 kg of corn requires 900 liters of water.

Then they solve a practical problem: A person uses an average of 6 liters of water to brush his teeth. To rinse a toilet bowl, use 2.5 times more water than to brush your teeth. For bathing - 10 times more than for rinsing a toilet bowl.
How many liters of water will a person consume per day if he brushes his teeth twice a day, rinses the toilet 5 times and bathes once a day?
We all think we use water wisely, but is that so?

The next task: Students should arrange in the fields "RIGHT" and "WRONG" how they use water in their daily lives. They work in groups and each group presents its solution (the task of each group is different and aims to summarize how to use water wisely in our daily lives).
After this task, the students themselves come to the following conclusion: Save water! It is not inexhaustible! Task 8 is a brainstorming session and students deal with it quickly, even without writing. It is known that 200 liters of water flow through a poorly closed fountain per day.
Estimate the losses if there are 2 unclosed taps in your home. What will be the loss for one day? And for a week?

The next task is practical. Task 9: In Petya's house, the kitchen faucet breaks down and drips for 12 minutes and fills a two-hundred-gram glass of water. How many liters of water flow in an hour?
Through it, students train to solve text problems and turn them into different units of measurement. They also learn to take into account family finances.

After these tasks, the students come to the conclusions on their own: Keep the taps in good condition. Save water! By saving water, you save family money.

At the end of the lesson, students are given the opportunity to think about what would happen if not a single drop of water remained on the planet.

It's time to think seriously about how to save every pond, every drop of clean water!

Humanity is not threatened by a lack of water. It is threatened by something worse - the lack of clean water.

The presentation ends that we have to save the water!

At the very end of the lesson, students participate individually in an interactive quiz that summarizes what they have learned.

Tips for the facilitator

1) The teacher with the summary directs the students' attention to what needs to change in order to preserve the water on the planet.
2) At the end of the lesson, students are given the opportunity to think about what would happen if not a single drop of water remained on the planet.

Debriefing

Students to create an interactive quiz that summarizes what they have learned.

Follow-up/Inspiration for the future

Information on social media, school website.

References/Further reading

https://www.youtube.com/watch?v=j5K5u3yCvhw
https://www.youtube.com/watch?v=Om42Lppkd9w
https://www.youtube.com/watch?v=71lBbTy-_n4

Annex

Project assignment:

In the form of a short text, answer the questions:

1. **The water is unique because ...**
2. **Water is needed because ...**
3. **Water should be used wisely because ...**
4. **The water must be kept clean because ...**
5. **Illustrate the project with a picture.**

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WE LEARN ABOUT WATER WITH FACTS AND FIGURES

1. Water has no color, it is transparent
2. The water has no smell
3. The water has no taste.

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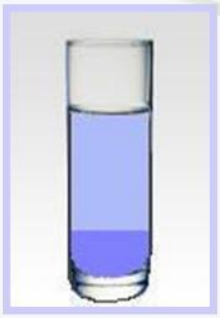
Water properties



Water is a solvent, but not allsubstances dissolve in it.

Work in groups

Water properties

Give examples of three substances that dissolve and three substances that do not dissolve in water.

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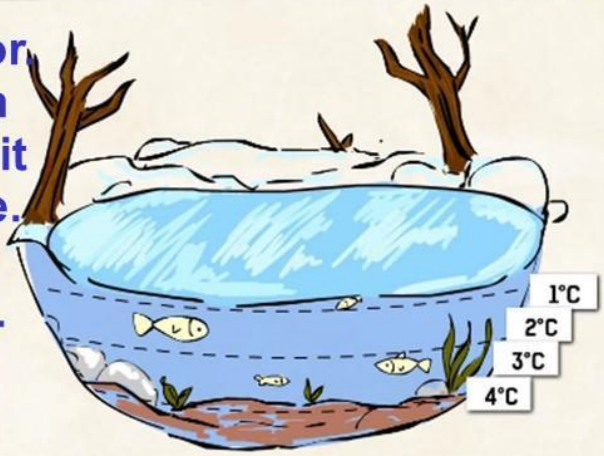
Water properties

Thermal conductivity

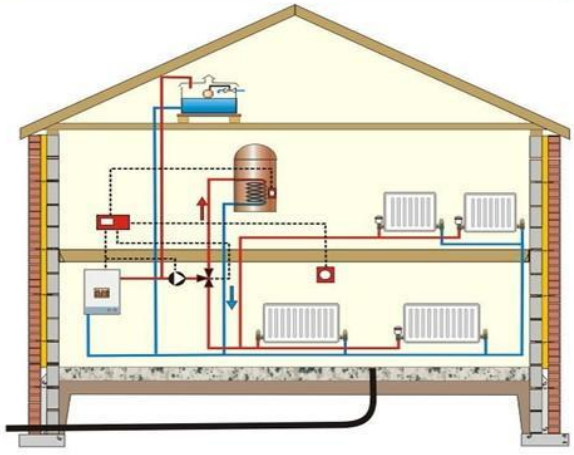
Ice is a bad heat conductor. Due to this property, when the lake freezes in winter, it freezes only on its surface. In this way the life in the water basins is preserved.



Water properties

Thermal conductivity

The liquid is a good heat conductor. Thanks to this property, central heating i created.



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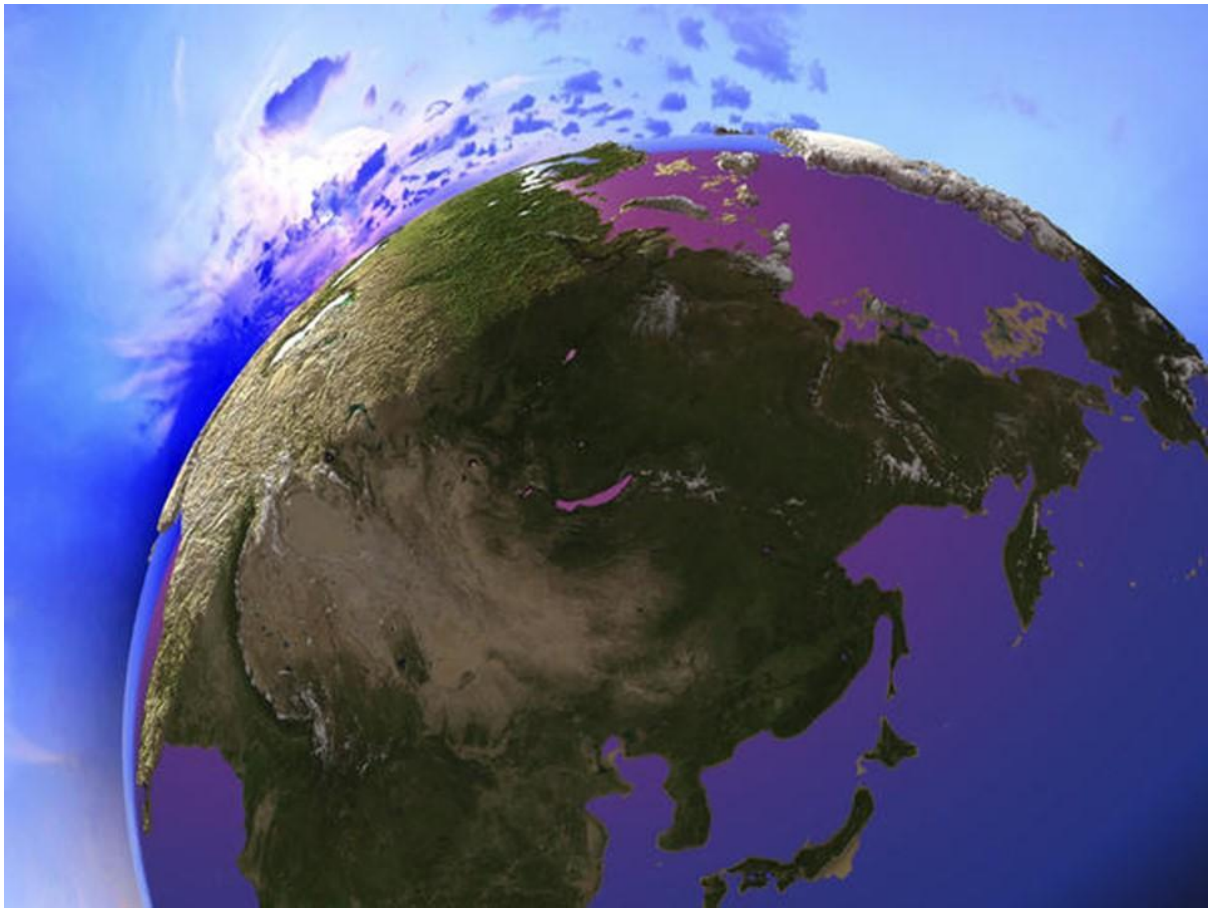

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The distribution of water and land on the surface of the globe

Total area of the Earth - 510.2 million sq. Km		
Occupied by land - 149.0 million sq. Km	Occupied by water -361.2 million sq. Km	Everything 510.2 million sq. Km

Task 1: Express water and land in percentages.Round the percentages to an integer.

The distribution of water and land on the surface of the globe

Task 1: Express water and land in percentages.Round the percentages to an integer.

DROUGHT:

WATER:

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Task 2: How many times is the area occupied by water larger than the land area? (Round to the tenth).

2,4

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Homework: Based on the data given in the table, create a pie chart of the distribution of land and water on Earth.

Total area of the Earth - 510.2 million sq. Km	
Occupied by land –	Occupied by water –
149.0 million sq. Km	361.2 million sq. Km

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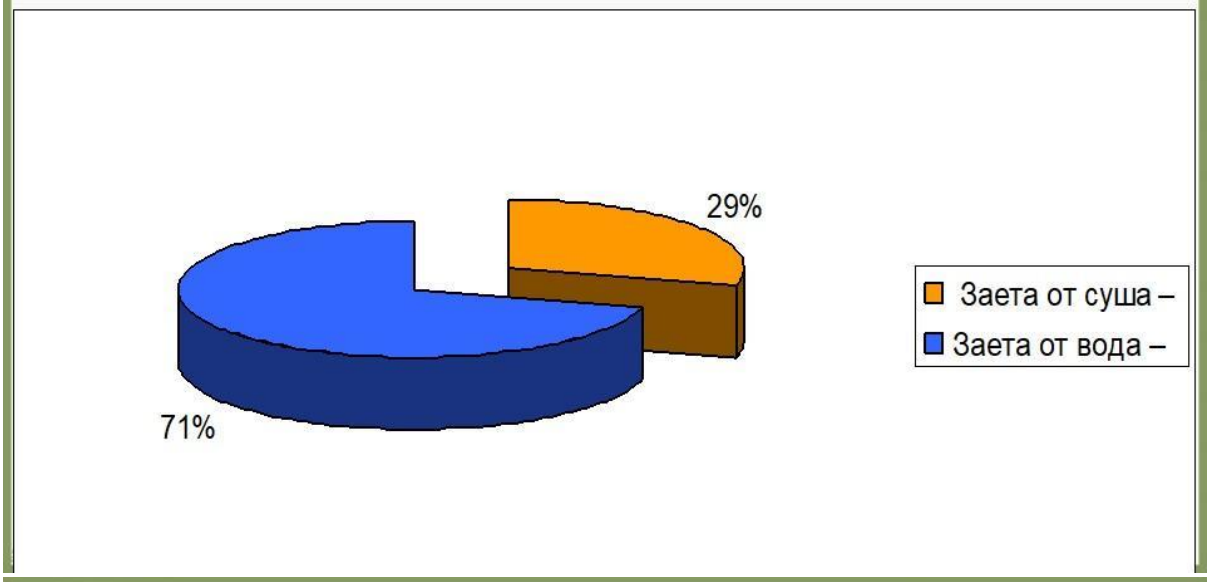
The distribution of water and land on the surface of the globe



Distribution of water on the Earth's surface

	mass million tons	Type of water %
World Ocean	142	Saltwater 97.5%
Rivers and lakes	0,05	Fresh water 2,5%
Glaciers	3,53	
Atmosphere	0,0013	

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WHAT CONCLUSION CAN WEDO WE DO IT?

Conclusion:

Man needs fresh water, and there is little fresh water on Earth.

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Did you know that: There is water in plants, in animals, in man and even in stone ...

Task 3: Spruce weighs 100 kg, of which 85% is water.

How many kilograms is itthe water?

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Solution of the problem:

$$85\% \text{ от } 100\,\text{kg} =$$

$$= \frac{85}{100} .100 = 85\,\text{kg water}$$

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Did you know that: There is water in plants, in animals, in man and even in stone ...

Task 4: The salmon weighs 2 kg, of which 1 kg and 500 g is water.

What percentage is water?

Solution of the problem:

X % from 2 kg. = 1.500 kg

$\frac{X}{100}$. 2=1,500

X= 1,500 .(100:2)

X=75% water

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Did you know that: There is water in plants, in animals, in man and even in stone ...

- **Task 5: In granite, the water is about 0.5%.**
- *In a ton of granite, how many kilograms is water?*

Solution of the problem:

1 t= 1000 kg

0,5% from 1000 kg= $\frac{0,5}{100}$. 1000=

= $\frac{5}{10.100}$ .1000 = 5 kg water

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Water in the human body

- There is nothing more precious in the world than the beautiful, most ordinary, pure water.

WHAT CONCLUSION CAN WEDO WE DO IT?

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Conclusion: Water is everywhere. In plants, animals, people, even in inanimate nature!

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DEFINITION OF WATER POLLUTION

Water pollution is defined as the pollution of lakes, rivers, oceans and groundwater caused by human impact, which can lead to the death of organisms and plants living in these environments.

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European Union policy for the protection of the World Window

- Everyone is obliged to protect the water and take care of this invaluable natural resource.

Work in groups

Task: What are the sources of water pollution?

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Causes of water pollution

Oil production and refining

Waste

Sewage and wastewater

Agriculture

Industry

Scientists have estimated that every year around the world so many harmful substances fall into the water that they can fill 10,000 trucks.

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Environmental pollution

- **Task 6: Oil is spilled on the surface of the water. The spill of oil on the surface of the water occupies a rectangular area. It is 26 meters long and 11 meters wide. Find the area of the oil slick.**

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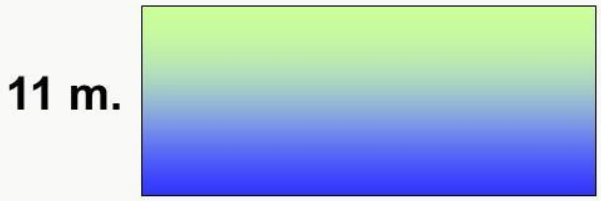
Solution of the problem:



S = 26 x 11 = 286 sq. M.is the oil slick

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Brain attack

How does water pollution harm:

Plants

The animals

People

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all living things suffer from water pollution.

Save water!



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Conclusion: Do not pollute the water! Dirty water kills all living organisms!

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Do not drink contaminated water

Contaminated water contains many impurities that are harmful to humans. To prevent unpleasant consequences, filter the water.

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Conclusion: Filter the water to be healthy!

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Did you know that:

One consumes a huge amount of fresh water.

The water used to produce agricultural or industrial goods is called 'virtual water', which is contained in the goods.

To receive:1 ton of steel, you need 150 tons of water250 tons of water are needed to produce 1 ton of paperTo make 1 cup of coffee, you need 140 liters of water.To produce enough flour for one loaf (400 grams), you need 550 liters of water.The production of 1 liter of milk requires 1000 liters of water.Production of 1 kg of rice requires 3000 liters of waterProduction per 1 kg of corn requires 900 liters of water

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Water consumption

Task 6: A person uses an average of 6 liters of water to brush his teeth.To rinse a toilet bowl, use 2.5 times more water than to brush your teeth.For bathing - 10 times more than for rinsing a toilet bowl.How many liters of water will a person consume per day if he brushes his teeth twice a day, rinses the toilet 5 times and bathes once a day?

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Solution of the problem:

2 x 6 liters of water for brushing teeth = 12 liters per day2.5 x 6 l. = 15 l.

Water for one rinsing of a toilet bowl5 x 15 liters = 75 liters of water per day for the toilet10 x 15 l. = 150 l.

Bathing water.12л. + 75l. + 150l. = 237 liters of water per day

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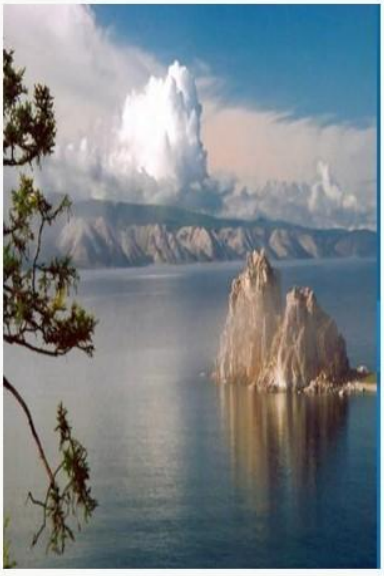
We all think we use water wisely, but is that so?

Human water consumption

- Mankind consumes a huge amount of fresh water. By the beginning of the 21st century, water consumption is more than 200 liters per person per day. According to the latest data in large cities, one person uses more than 500 liters per day. Although according to the calculations of specialists per person does not need more than 250 liters of water per day.



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WHAT CONCLUSION CAN WEDO WE DO IT?

Conclusion: Save water! It is not inexhaustible!

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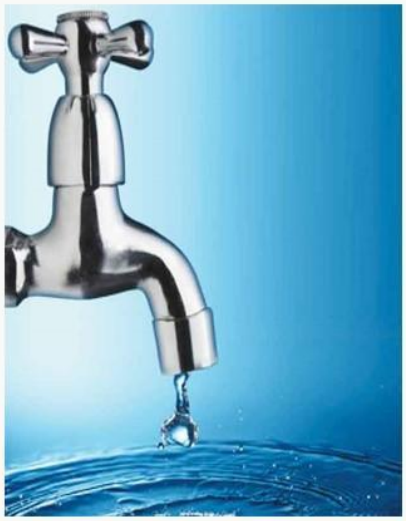
Wash your hands and don't forget to turn off the tap!



It is estimated that 8 liters of water will flow in a minute from a faulty tap.

Save water!

Three drops of water per second from a poorly closed tap is almost 30 liters per day. Remember: Water supplies are not infinite!

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Task 7. It is known that 200 liters of water flow through a poorly closed fountain per day.Estimate the losses if there are 2 unclosed taps in your home.What will be the loss for one day?

And for a week?

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Task 8: In Petya's house, the kitchen faucet breaks down and drips for 12 minutes and fills a two-hundred-gram glass of water. How many liters of water flow in an hour?

Solution of the problem:

For 12 minutes - 1 cup of water = 200 g.

1 hour = 60 minutes = 5. 12 minutes

5. 200 g = 1000 g = 1 liter of water

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WHAT CONCLUSION CAN WEDO WE DO IT?

Conclusion: Keep the taps in good condition. Save water!

By saving water, you save family money.

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Life without water ...

Imagine that there is not a single drop of water left on the planet. What will happen then? Instead of the ocean of the world - the desert!

- All life on Earth will die, the planet will be left without living beings. Scientists have found: a person without food can live 3-4 weeks, and without water 3-4 days, then he will die.

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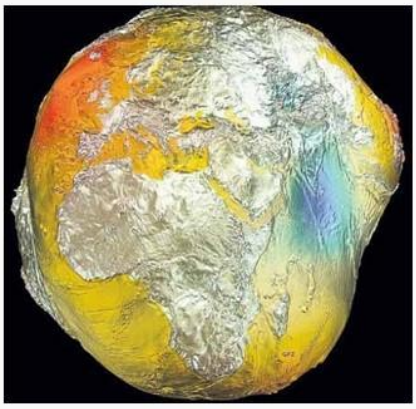
This is what our planet will look like ...

Unpleasant picture ...



Only drought

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. It's time to think seriously about how to save every pond, every drop of clean water! Humanity is not threatened by a lack of water. It is threatened by something worse - the lack of clean water.

Ранько Е. А.

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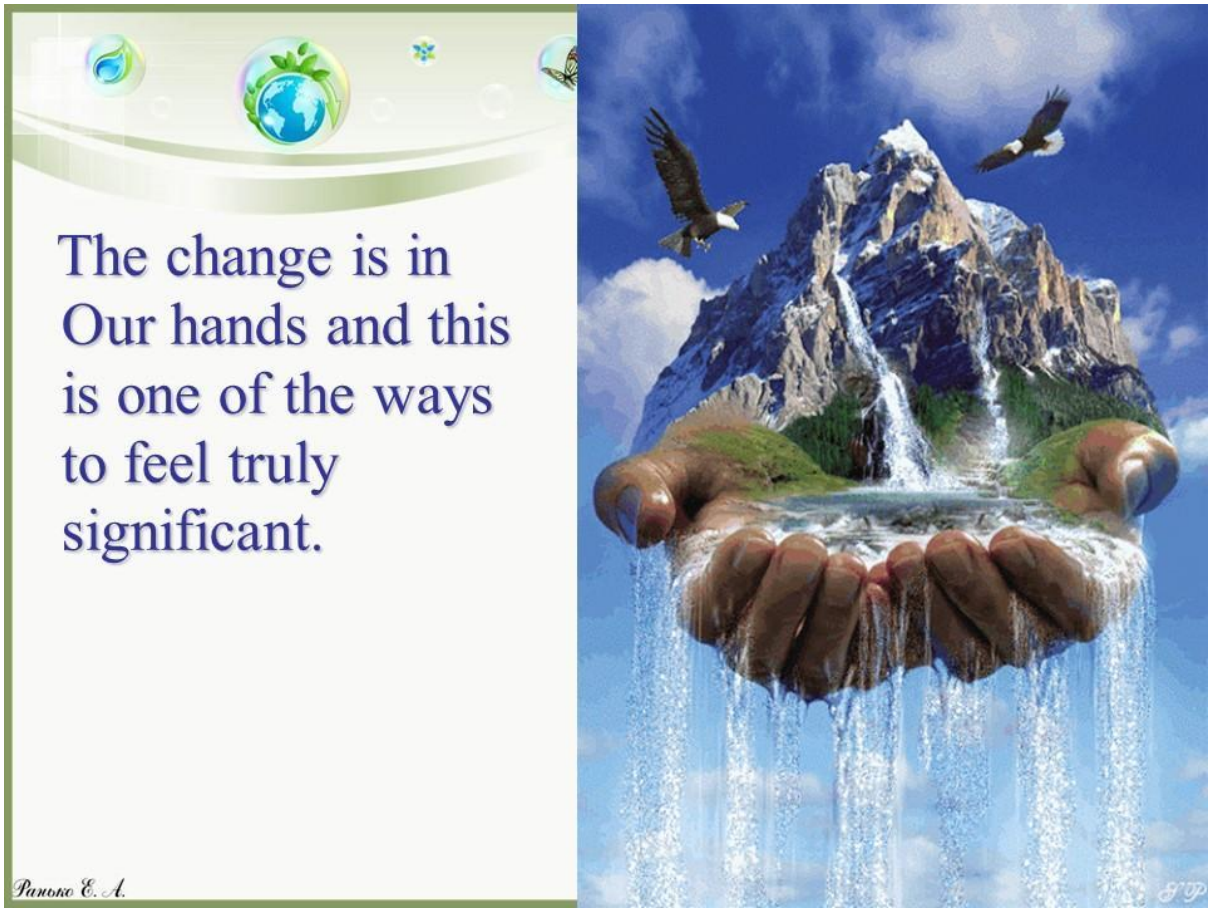
НАЦИОНАЛНА АГЕНЦИЈА ЗА ЕВРОПСКИ ОБРАЗОВНИ ПРОГРАМИ И МОБИЛНОСТ


The change is in
Our hands and this
is one of the ways
to feel truly
significant.
Ранько Е. А.