DETERMINATION OF WATER PARAMETERS

The water around us – investigation, measurement and interpretation of results



National High School of Informatics, Arad, Romania

MARCH 2025

Sowing Change (SCH):Roots for Inclusion and Self-Knowledge through a Sustainable European Nature
2024- 2026

Project agreement number: 2024-1-ES01-KA220 -SCH-000245566

Analysis of water quality from local sources

Practical activity carried out by students of the National High School of Informatics Arad

As part of the Erasmus+ project, students carried out a practical activity investigating the quality of water from four different sources: water from the school yard pond, water from the Mureș River, water from a well and water from Lake Pădurice.

The aim of the activity was to develop scientific investigation skills and environmental responsibility by measuring and comparing the main physico-chemical parameters of water. Students used equipment and analysis kits to determine the parameters, recorded the results obtained, compared the measured values with the reference values and formulated conclusions regarding the quality of water from each source.

The brochure presents the working methodology, the recorded values, the interpretation of the results and the conclusions formulated by the students, highlighting the importance of monitoring water resources and protecting the environment.

Participants in the activity: students from grades 6 A, 6 D, 6 E, 7 A and 7 D from the National High School of Informatics in Arad, Romania.



Activity coordinators: Bundik Lavinia, Geography teacher
Lupșa Liliana, Chemistry teacher
Brochure writing and production: teacher Bundik Lavinia

Monitoring water parameters is essential to ensure its quality and safety, whether it is drinking water, water used in industry or water from natural ecosystems.

1. Physical parameters

Temperature – influences oxygen solubility and biological activity.
Turbidity – indicates the presence of suspended particles that may contain microorganisms and impurities.
Color – can signal the presence of organic substances or metals.
Smell and taste – can indicate contamination with chemicals or microorganisms.

2. Chemical parameters

pH – indicates the acidity or alkalinity of water and influences the toxicity of certain substances.

Dissolved oxygen (DO) – essential for aquatic life and for self-purification processes.

Organic substances (BOD5, COD) – indicates the degree of organic pollution and the oxygen consumption required to decompose organic matter.

Nitrates, nitrites and ammonia – can come from agricultural waste or wastewater and indicate possible contamination.

Phosphates – can cause eutrophication of water, leading to excessive algae growth.

Heavy metals (lead, mercury, cadmium, arsenic, etc.) – toxic to humans and animals.

Residual chlorine – important in drinking water for disinfection, but must be controlled to avoid negative effects.

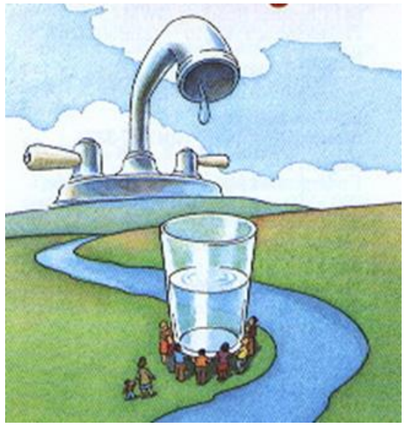
Water in Arad is used for

industr
y

bread factory

domestic
use

farms



agriculture

alcoholic beverages, wine

The main source of water comes from underground boreholes, made at depths between 30 and 250 meters.

Parameters tested:

- Dissolved Oxygen
- pH
- Turbidity
- Temperature



These are just routine checks, but they provide an immediate look at the water quality, being able to detect whether the water is polluted or not.

To make an effective comparison, we choose 4 water sources:

1. Tap water

2. River water (Mureş River)

3. Lake water (Pădurice)

4. Fontain water

Dissolved oxygen

Dissolved oxygen involves measuring the amount of molecular oxygen (O2) dissolved in water.
The amount of molecular oxygen dissolved in water indicates whether living organisms, fish and macroinvertebrates that need oxygen can grow in the water.
The lower the amount of oxygen, the more polluted the water is.

RESULTS OBTAINED

Water source	D
Water tap	4
River Mureş	5
Pădurice lake	4

Large amounts of organic matter decrease the concentration of dissolved oxygen as a result of decomposition. Alluvium, leaves, branches, grasses consume oxygen and decrease water quality.

RESULTS OBTAINED

Water source	pH-ul
Water tap	7
River Mureș	7.5

A pH level of 7 is considered neutral. Lower values, between (0, 7) indicate acidic conditions, and a pH value greater than 7, i.e. in the range (7, 14) represents basic conditions, also called alkaline conditions.
A pH between 6 and 9 appears to be favorable for fish and other aquatic life. Neutral pH conditions are conducive to the development of a wide variety of healthy species.

pH

pH is a measure of the acid-base character of a solution. In the case of water, it is a measurement of the concentration of hydrogen ions [H+]

Whether water is acidic or basic directly affects the survival of aquatic species.

TURBIDITY

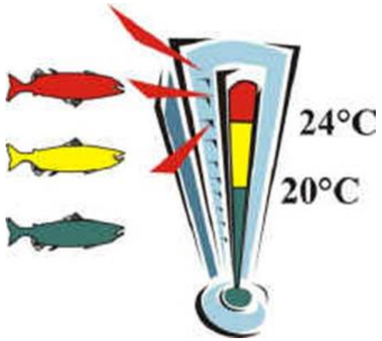
Turbidity is a measure of the clarity of water. Clarity depends on the amount of silt, sand, silt, clay or other solid materials suspended in the water, or dissolved.

RESULTS OBTAINED

Water source	Turbidity
Apă de la robinet	0.00
Râul Mureş	42.00
Lacul de la Pădurice	40.00
Fântână	0.00

TEMPERATURE

Temperature is an important indicator because it affects feeding, photosynthesis, metabolism, and the solubility of gases and minerals. Colder water contains more dissolved oxygen, which is essential for the survival of aquatic organisms.



RESULTS OBTAINED

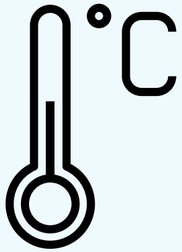
Water source	Water temperature	Air tempera
Water tap	10°C	13°C
River Mureș	7°C	13°C
Pădurice lake	8°C	13°C
Fountain	6°C	13°C

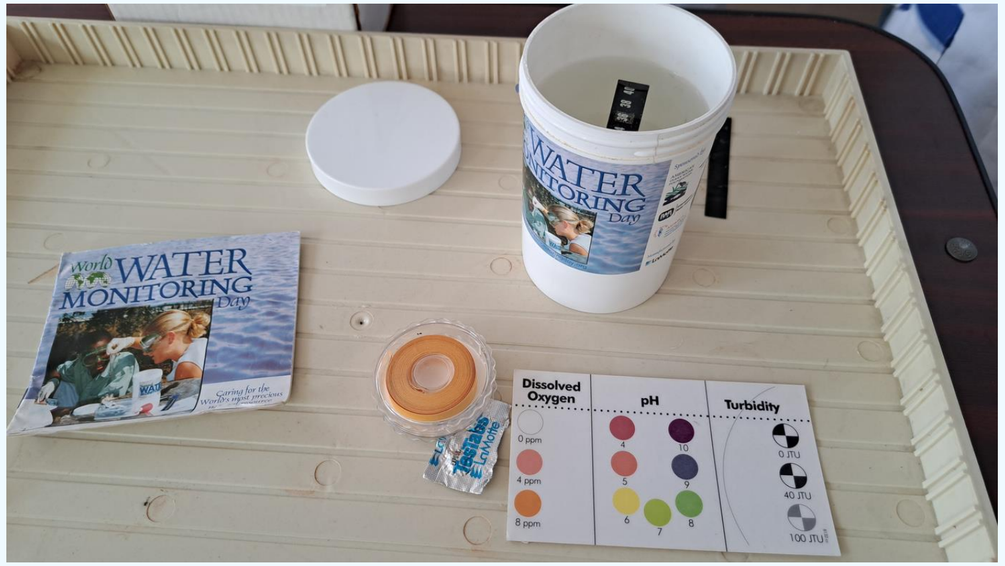






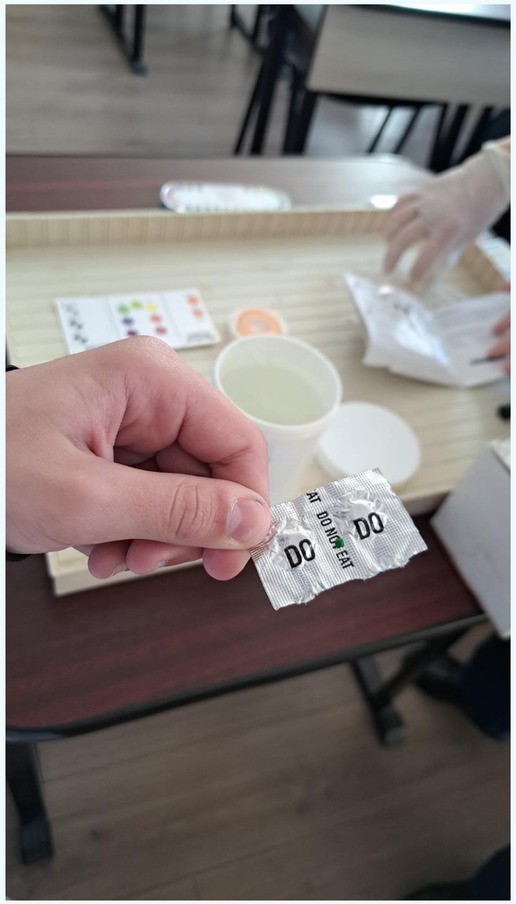
we measure the temperature



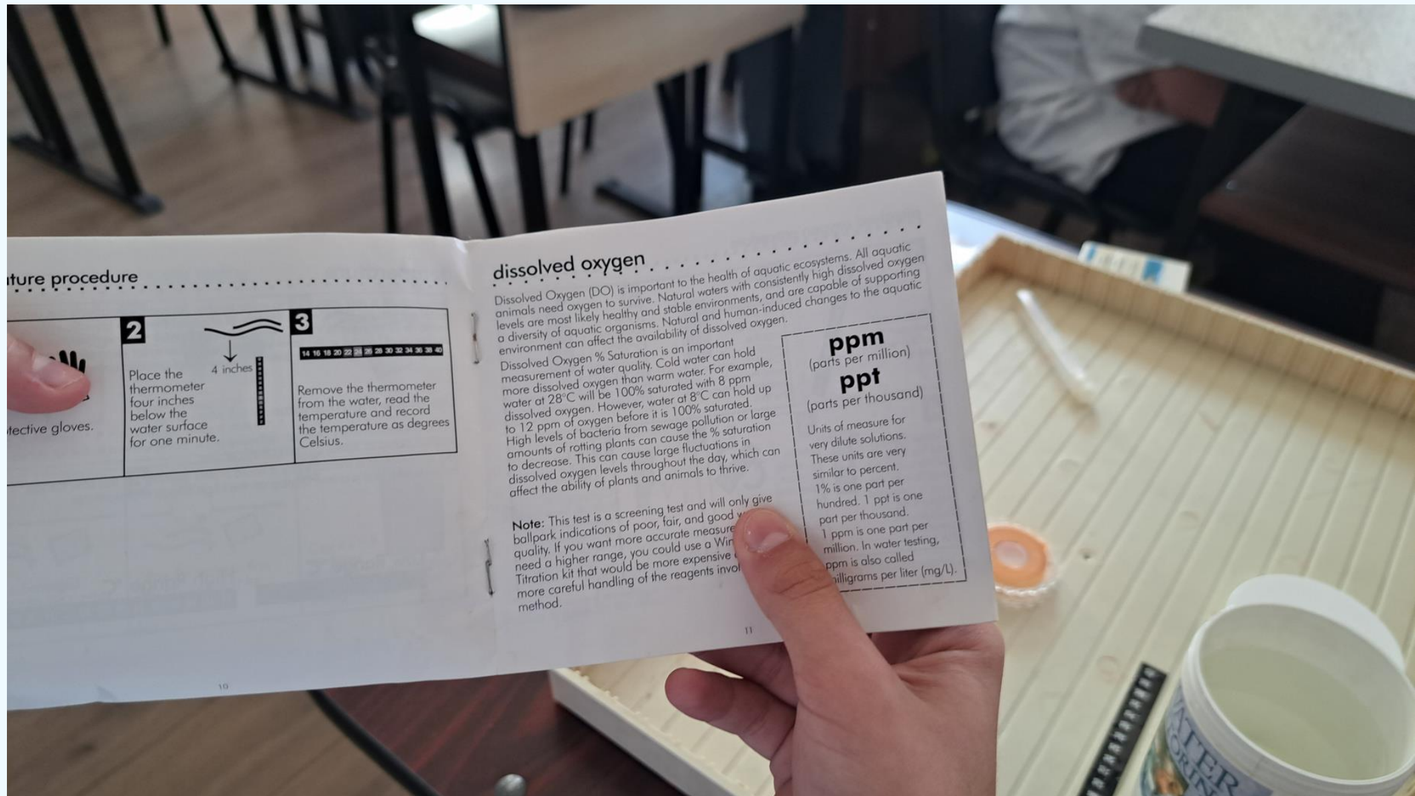


Ioana Ș. fills the container with tap water

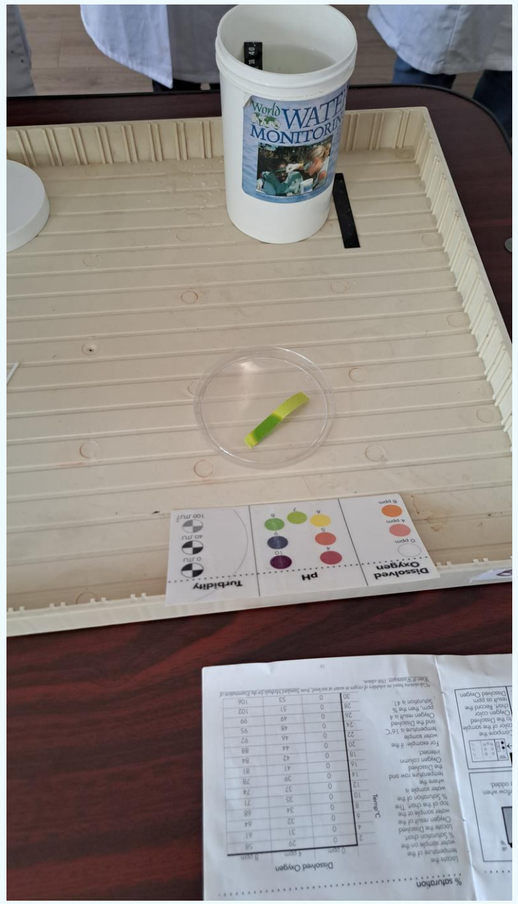
We determine dissolved oxygen and saturation level



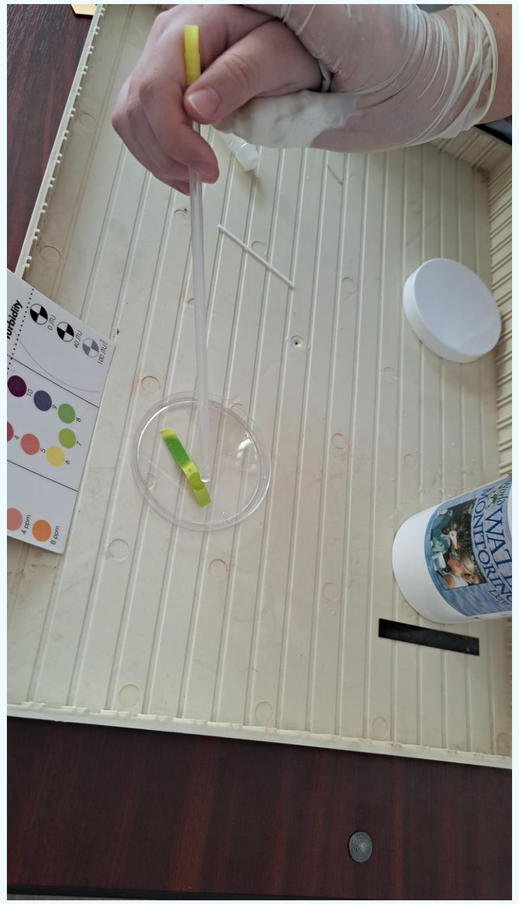




Determining the pH and turbidity of water



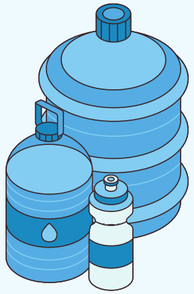




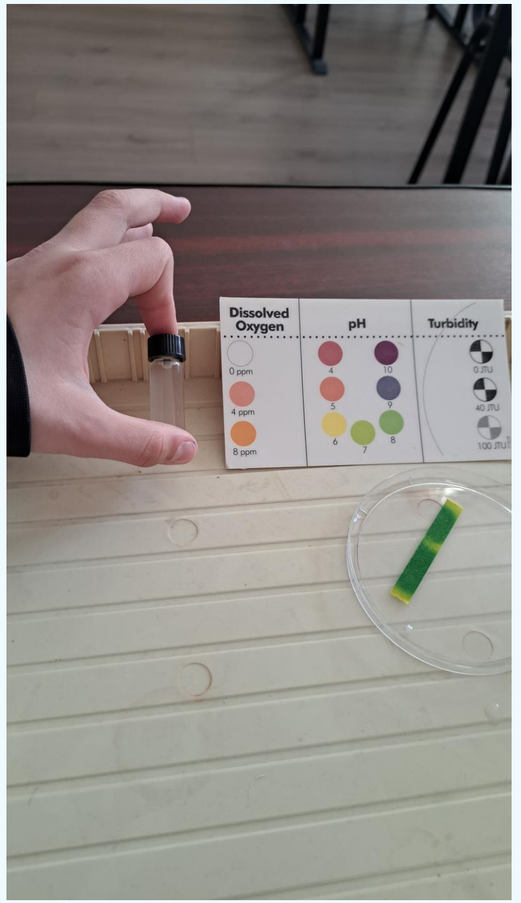




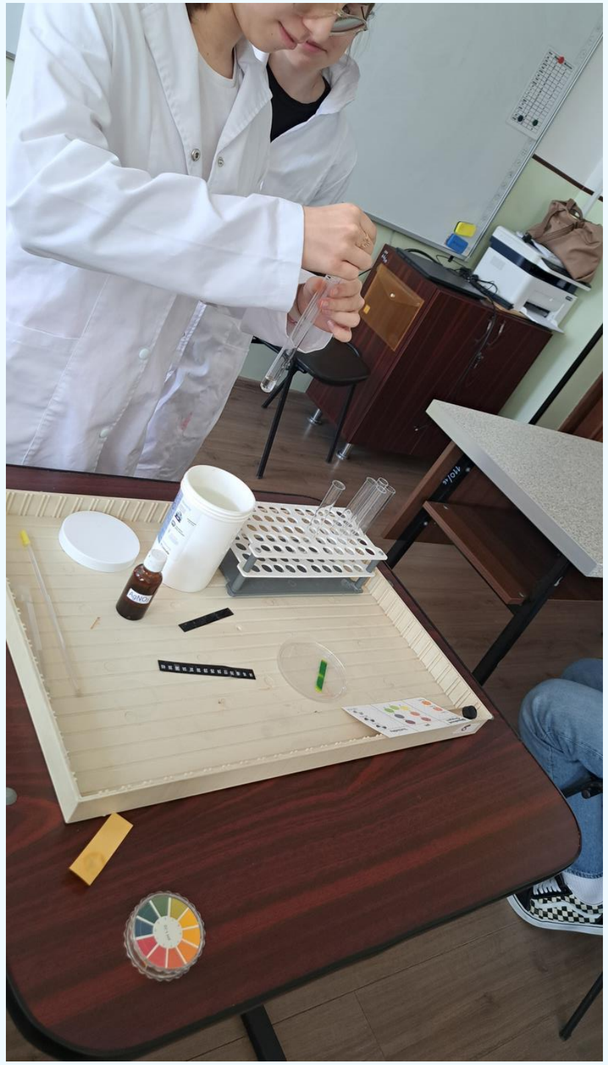


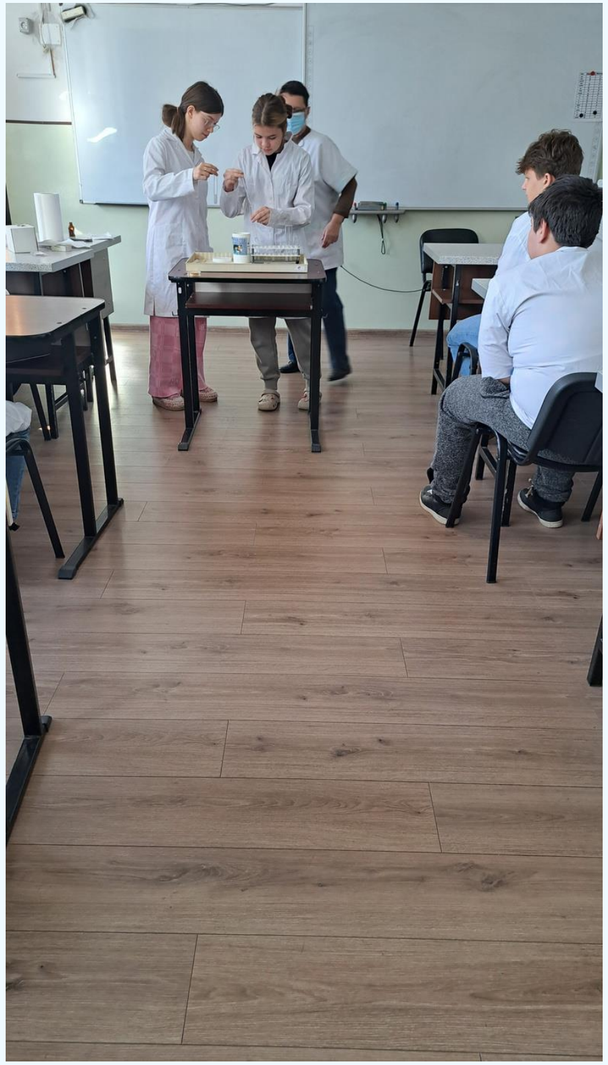






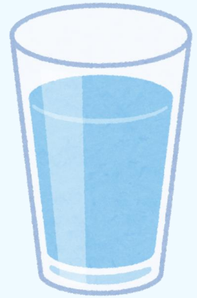
Determining the alkalinity of water















Raisa & Ayan measure turbidity

Daria is involved in water testing











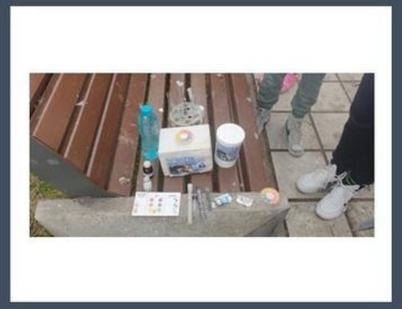


Victor from 7A grade & Alex from 6E
with their chemistry teacher





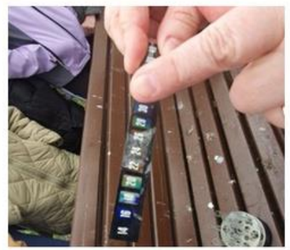






The students coordinated by teacher Andreea Stanculea and the chemistry teacher
established the water parameters in the lake near the school, called Pădurice Lake.







FINAL RESULTS

The place of collectio	DO2 (ppm)	pH	Tur
Water tap	4	7	
River Mureş	5	7.5	
Pădurice lake	4	8	
Fountain	4.5	6.5	

THE STUDENTS TOOK TWO MEASUREMENTS, IN MARCH AND JUNE.



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SCH-Sowing Change

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Biodiversity Tank:

WATER ANALYSIS

Country: România Date: 06.03.2025

School Name: Liceul Național de Informatică Arad

Student´s Names	Crișan Raul Mihai

Water Temperature	10 °C	Outside Temperature	13 °C

Humidity % Volume L

Bacteria	0 no./100 mL	Chlorine	25 mg/L
Copper	0,08 mg/L	Dissolved oxygen	0,9 mg/L
Hardness	15°DH	Iron	30 µg/L
Nitrate	0,05 mg/L	Phosphate	–

pH 7 pH units





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WATER ANALYSIS

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School Name: LICEUL NAȚIONAL DE INFORMATICĂ

Student´s Names	CETEAN AMALIA NICOLE

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Humidity % Volume L

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Copper	0,08mg/L	Dissolved oxygen	0,9mg/L
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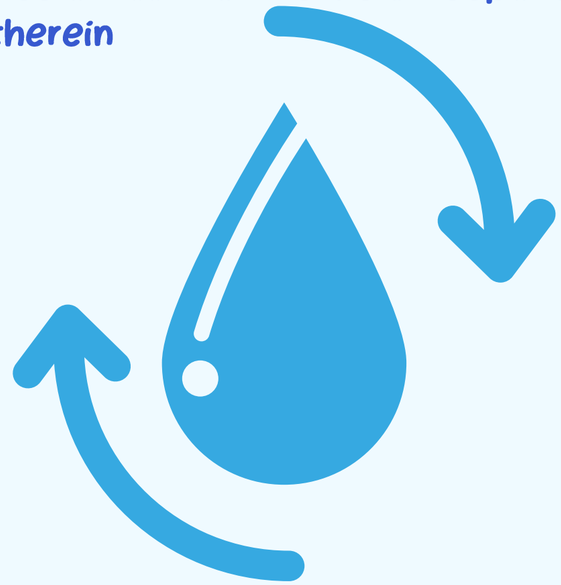
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