Współfinansowane przez Unię Europejską

Life in a Drop of Water

Project context

Erasmus+ educational workshop / international cooperation activity

Type of activity

Science workshop combining biology and chemistry, with practical laboratory work

Duration

2 × 45 minutes (or one extended workshop session)

Target group

Primary or lower secondary school students (age adapted to participants)

Place of implementation

Science laboratory / biology classroom equipped with microscopes

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Aims of the workshop

General aims

- To develop students' scientific curiosity through hands-on experiments and observation.
- To raise awareness of biodiversity present in aquatic environments.
- To promote environmental responsibility and understanding of water as a valuable natural resource.
- To foster international cooperation and inquiry-based learning within the Erasmus+ framework.

Specific learning objectives – students will:

- investigate and compare basic physico-chemical properties of water from different sources,
- prepare a simple microscope slide independently,
- use an optical microscope correctly and safely,
- observe and identify living unicellular organisms in water samples,
- record and document observations through drawings, notes or digital recordings,
- follow written instructions provided in a worksheet.

Teaching methods

- inquiry-based learning
- experimental method
- microscopic observation
- guided discussion
- practical laboratory work

Forms of work

- individual work
- pair work
- small group work

Materials and resources

- optical microscopes
- microscope slides and cover slips
- droppers / pipettes
- water samples from different sources (river water, tap water, rainwater)
- protozoa culture prepared in advance using river water from the local river flowing through Konstancin-Jeziorna
- student worksheets
- paper towels and tissues
- smartphone (optional – for documenting microscopic observations)

Workshop procedure

1. Introduction (approx. 10 minutes)

- Welcoming the participants and presenting the topic of the workshop.

- Short introductory discussion: Where does water around us come from? Is water always clean and lifeless?
- Presentation of workshop aims and safety rules for working with microscopes.

2. Investigation of water properties (approx. 20 minutes)

- Students receive water samples from different sources (river, tap, rainwater).
- They examine selected physico-chemical properties appropriate to their age (e.g. colour, smell, transparency).
- Observations are recorded in the worksheets.

3. Preparation of microscope slides (approx. 20 minutes)

- The teacher explains and demonstrates how to prepare a microscope slide.
- Students work according to the worksheet instructions:
    1. Use a dropper to place a drop of water on a microscope slide.
    2. Cover the sample carefully with a cover slip.
    3. Place the prepared slide on the microscope stage.
- Students prepare their own slides independently.

4. Microscopic observation (approx. 30 minutes)

- Students observe their slides under the microscope.
- The teacher provides a protozoa culture prepared a few days earlier to ensure that living unicellular organisms can be observed.
- Students describe, draw and discuss what they can see.
- One of the students documents the microscopic observations by recording a short video using a smartphone.

5. Summary and reflection (approx. 10 minutes)

- Group discussion and sharing observations.
- Reflection on what students have learned about water and microscopic life.
- Discussion on the importance of clean water for ecosystems and human health.

Learning outcomes

- Completed student worksheets.
- Correctly prepared microscope slides.
- Drawings, written descriptions and/or video recordings of microscopic observations.
- Increased environmental awareness and understanding of aquatic biodiversity.

Organisational notes

- The protozoa culture should be prepared several days before the workshop.

- The workshop can be implemented as part of an Erasmus+ project, environmental education programme or international student exchange.
- The scenario supports the development of key competences such as scientific literacy, collaboration, communication and digital skills.