„Ostatnia szansa – zachowanie bioróżnorodności dla następnych pokoleń”

(2015-1-PL01-KA219-016980_3)

Examining the pollution of soil, water and air using chemical and biological methods

Ecological workshop in the Centre of Ecological Education in Szczecinek

Thursday, 13.10.2016

OBJECTIVES OF THE WORKSHOP:

1. Helping students understand the impact of human activies on the natural environment.
2. Justifying the need for our responsibilities towards the natural environment.
3. Raising awareness of the need for pro-ecological activities.
4. Increasing the knowledge about reasearch considering the level of cleanliness of water, soil and air.

METHODS OF THE WORKSHOP :

1. Presenting the multimedia presentation about water purity classes, types of impurities in water and their sources, the rules of safety during sampling, conducting chemical experiments and biological analyses, research methodology.

2. Working in international groups with the use of worksheets.

3. Collecting lake water samples for analyses and conducting experiments.

4. Learning to make conclusions.

THE LEARNING OUTCOMES OF THE WORKSHOP - THE STUDENT:

- ✓ Knows types of impurities in water, their sources and influence on the environment.
- ✓ Enumerates the key indicators of water quality.
- ✓ Can identify the main sources of the pollution of surface water.
- ✓ Knows the rules of safety during sampling, conducting chemical experiments and biological analysis.
- ✓ Can perform the determination using the instructions.
- ✓ Can carry out an experiment, analyse the results and draw conclusions .
- ✓ Can indicate the water purity class of the examined samples of water .

DETAIL OBJECTIVES:

- ✓ Ability to use bio-indicators in the outdoor assessment of environmental pollution.
- ✓ Ability to use lichen scale.
- ✓ Understanding the connection between organism and its habitat.
- ✓ Ability to analyze the results of the outdoor observations.
- ✓ Ability to work with the key to recognize the lichens.
- ✓ Ability to find indicator species in the particular area.
- ✓ Ability to present the results and conclusions of the observation.

GENERAL CRITERIA:

- ✓ Learning about the ways to check the damage of the environment judging by the plants that grow in the particular area.
- ✓ Learning lichen scale.
- ✓ Learning about the habitat of lichens and their fragility on the contamination with sulfur oxides.
- ✓ Creating the attitudes of disapproval for human activity that causes environment pollution.
- ✓ Developing the interest in nature, implementation of the independent research.
- ✓ Acquiring skills of writing down the observation and drawing conclusions.

WORKSHOP IN CITY PARK IN SZCZECINEK

Topics of the workshop:

1. Assessing the cleanliness of air with the use of bio-indicators – the lichen scale
2. Determining soil pH with the use of indicator plants

OBJECTIVES OF FIELD RESEARCH ON AIR POLLUTION IN SZCZECINEK

1. Aquiring the ability to use the lichen scale.
2. Getting to know species of lichens used as bio-indicators.

3. Doing an analysis of the cleanliness of air.
4. Working in international groups.

5. Aquiring essential biological knowledge.

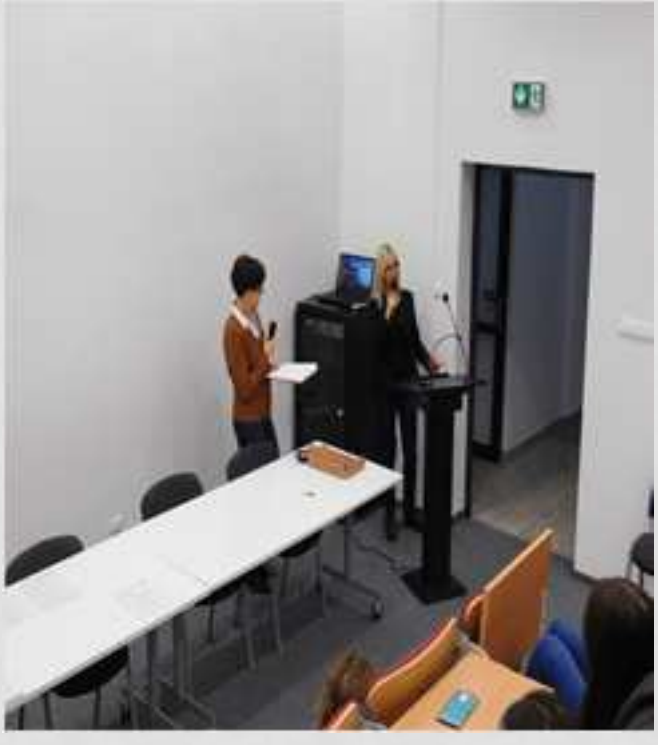
INAUGURATION OF WORKSHOP IN THE CENTRE OF ECOLOGICAL EDUCATION IN SZCZECINEK

WELCOMING OF THE PARTICIPANTS OF ERASMUS + WORKSHOP

PRESENTING THE OBJECTIVES OF THE WORKSHOP AND THE TOPICS COVERED IN THE WORKSHOP

PARTICIPANTS OF THE ECOLOGICAL WORKSHOP

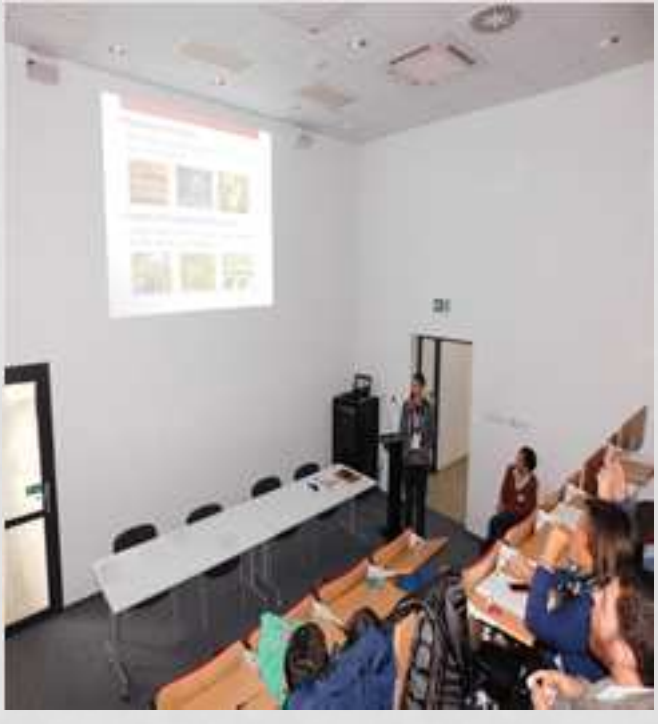
CARRYING OUT A DIAGNOSTIC TEST

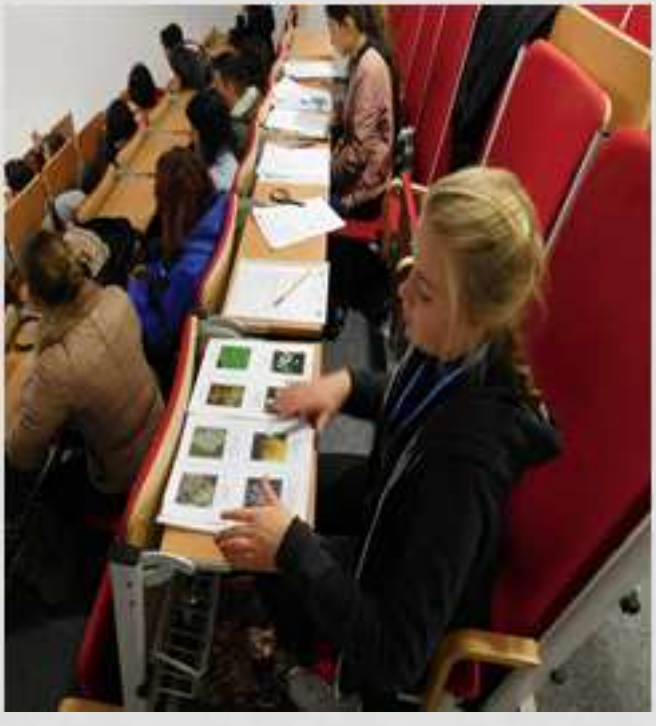


DIAGNOSTIC TEST

PRESENTATION OF THE PROBLEM OF ANALYSING THE QUALITY OF AIR

(GIVEN BY ONE OF THE PARTICIPANTS OF THE PROJECT)

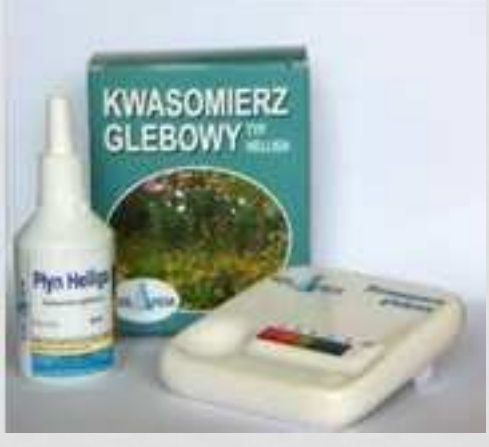




TOPICS OF FIELD RESEARCH:

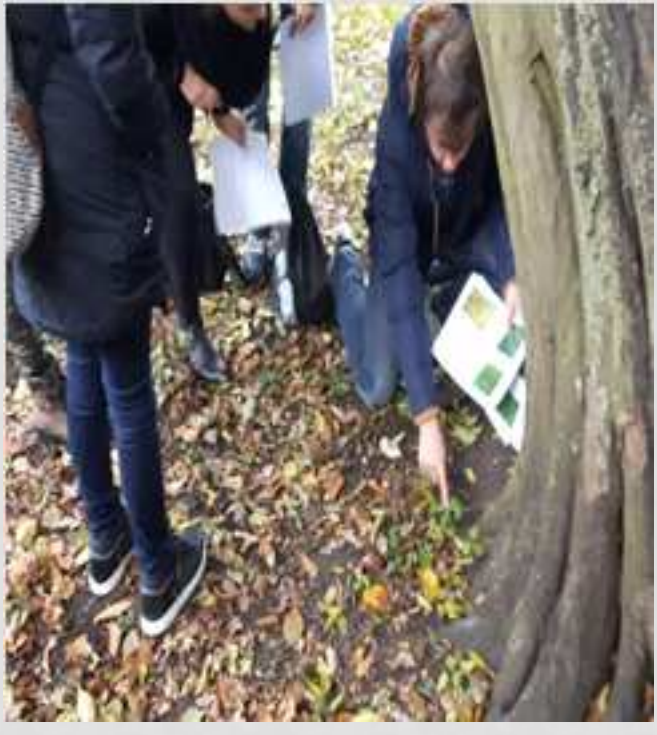
- ➢ *Assessment of the cleanliness of air with the use of bio-indicators – the lichen scale*

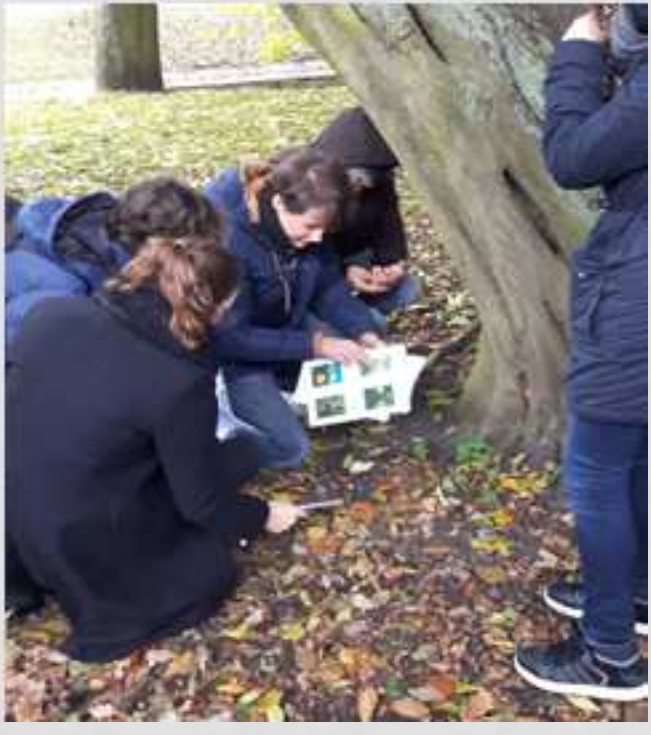
- ➢ *Recognizing soil pH with the use of indicator plants*



ASSESSMENT OF AIR CLEANLINESS WITH THE USE OF BIO- INDICATORS – THE LICHEN SCALE.

RECOGNIZING SOIL PH WITH THE USE OF INDICATOR PLANTS.





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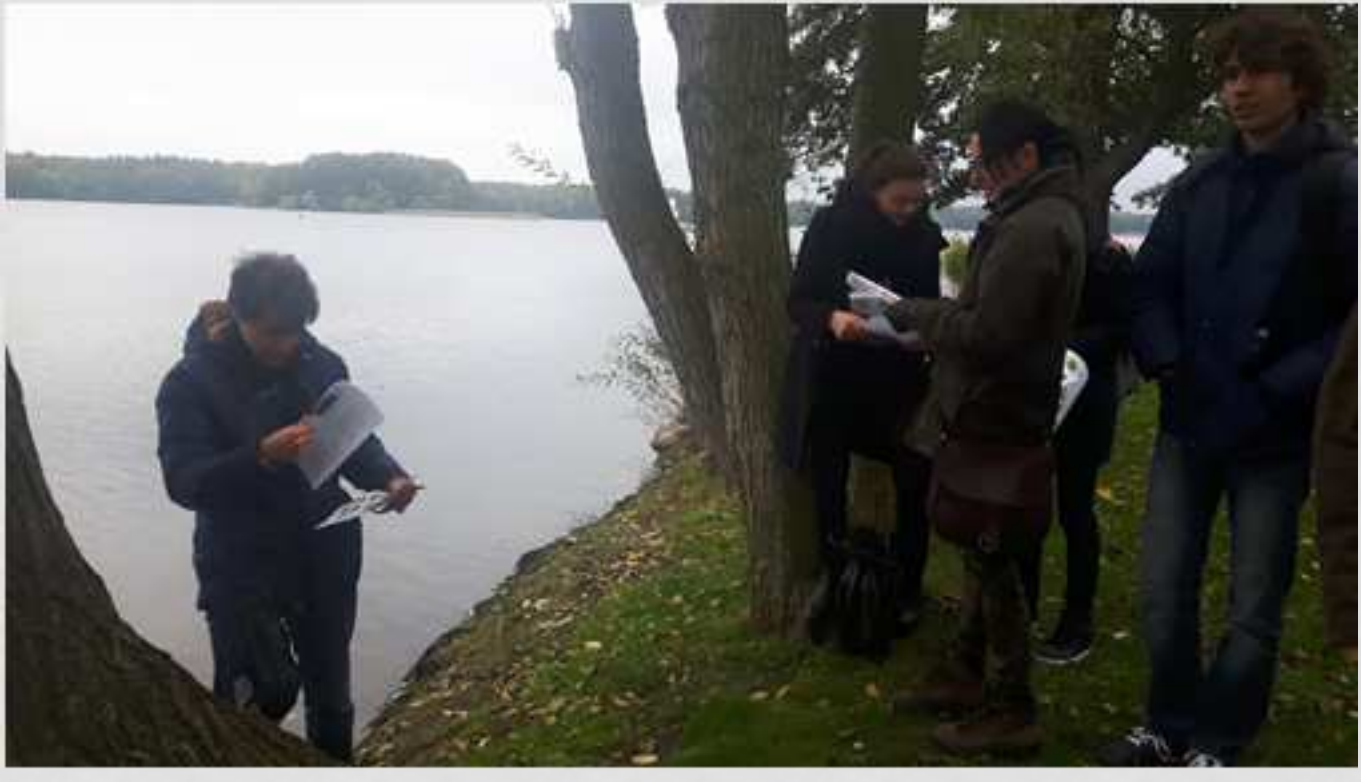

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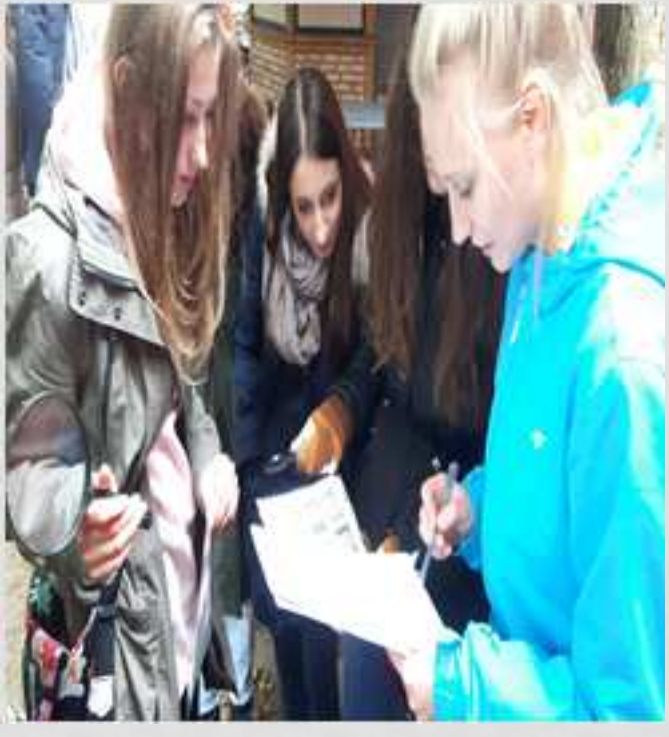

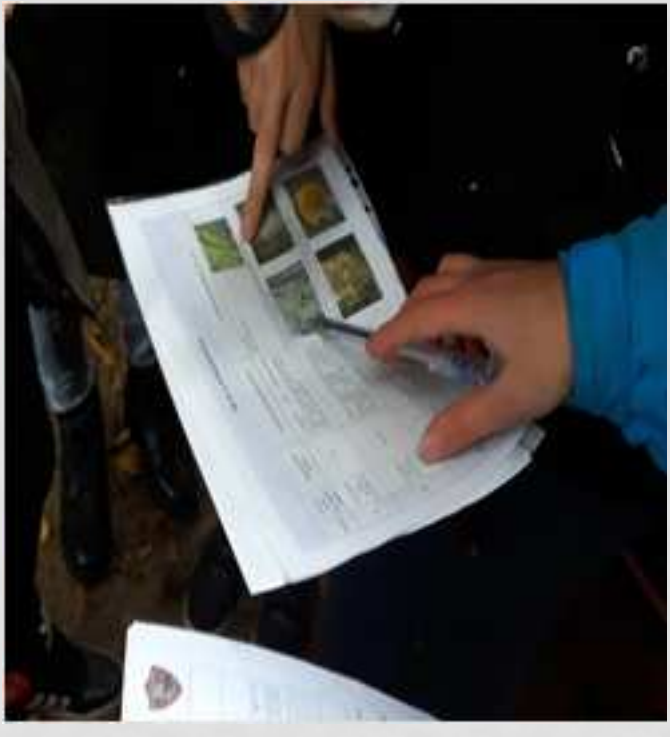

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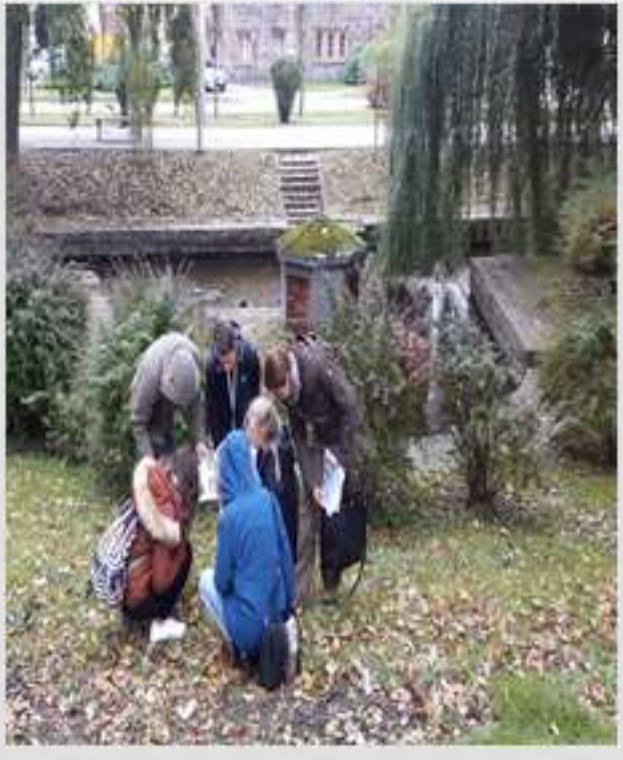

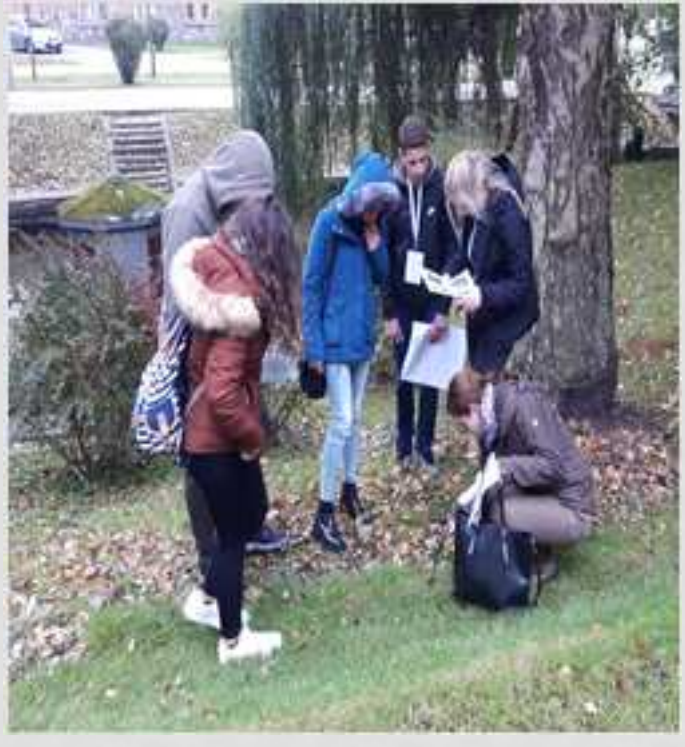

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RECOGNIZING SOIL PH WITH THE USE OF INDICATOR PLANTS.

ASSESSMENT OF AIR CLEANLINESS WITH THE USE OF BIO- INDICATORS – THE LICHEN SCALE.

RECOGNIZING SOIL PH WITH THE USE OF INDICATOR PLANTS.

TOPICS OF LABORATORY CLASSES:

- ✓ *PHYSICO-CHEMICAL ANALYSIS OF SOIL QUALITY*

THE INFLUENCE OF ACIDIFICATION OF SOIL ON VEGETATION,

ASSESSING THE QUALITY OF SOIL SAMPLES FROM THE COUNTRIES OF PROJECT PARTICIPANTS.

- **Physico-chemical analysis of soil samples brought from the countries of project participants**

LABORATORY CLASSES
IN INTERNATIONAL GROUPS

Determining the pH level of the soil samples

Determining the pH level of the soil samples

ASSESING THE QUALITY OF THE SOIL SAMPLES FROM THE COUNTRIES OF PROJECT PARTICIPANTS

FIELD RESEARCH ON LAKE TRZESIECKO IN SZCZECINEK

TOPICS OF THE RESEARCH:

*1. **Physical and chemical analysis of water quality.***

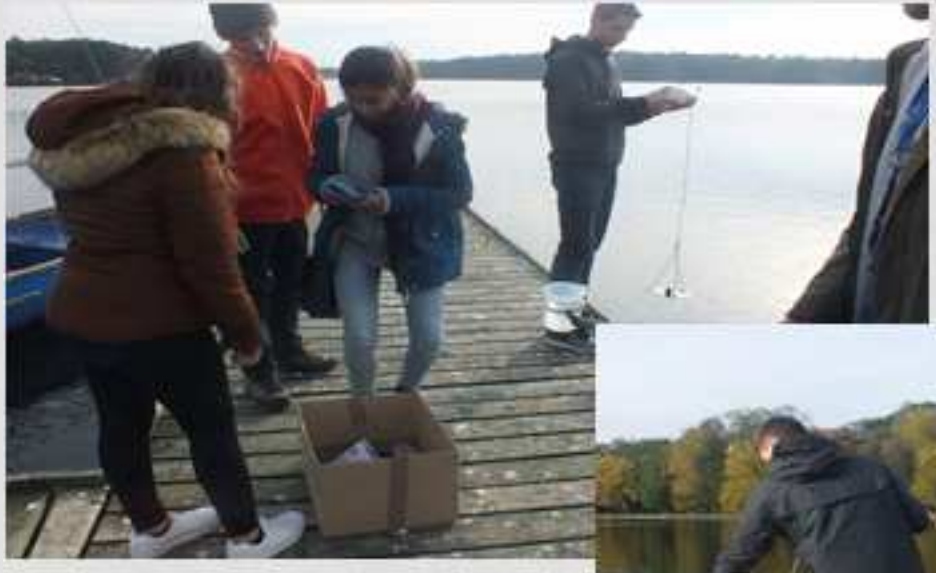
2. Workshops were carried out in the auditorium and laboratories of CEEiRJ in Szczecinek and on Lake Trzesiecko

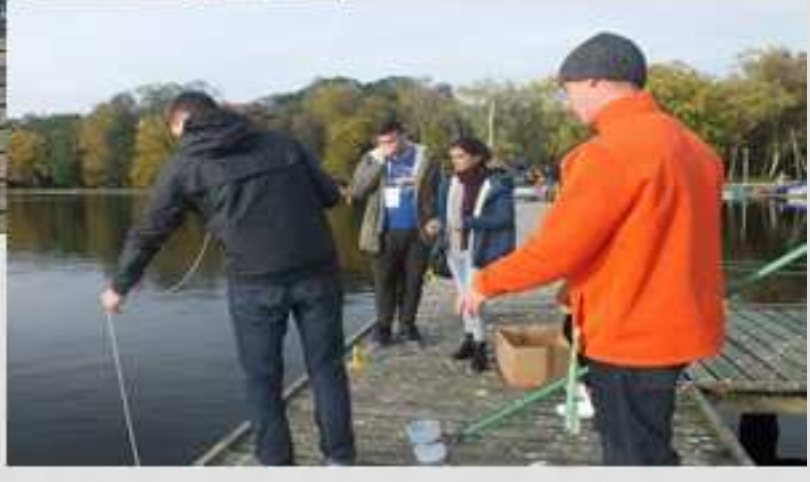
THE EDUCATIONAL OBJECTIVES OF THE WORKSHOP - THE STUDENT:

- ✓ Understands the impact of human activity on the natural environment.
- ✓ Justifies the need for responsibility for the natural environment.
- ✓ Is aware of the need for pro - ecological activities.
- ✓ Can cooperate in a group.
- ✓ Knows the importance of scientific research.

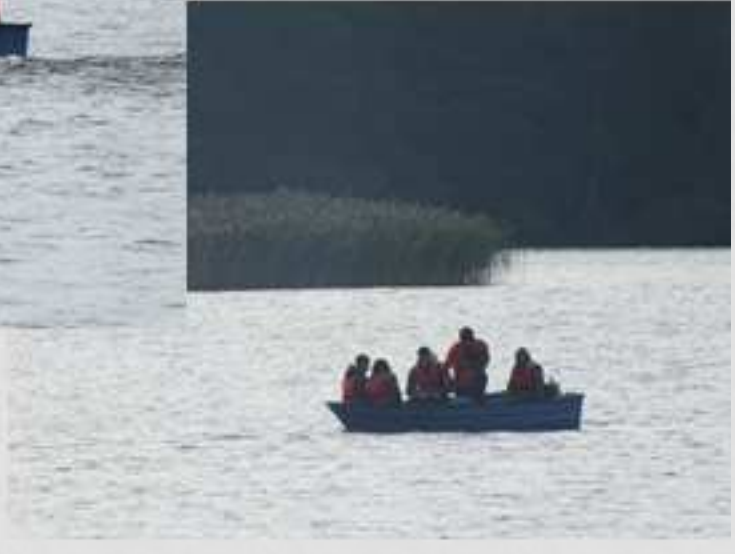
PROJECT GROUP ANALYSING THE QUALITY OF WATER IN LAKE TRZESIECKO

COLLECTING WATER SAMPLES FROM THE PIER ON LAKE TRZESIECKO





COLLECTING WATER SAMPLES



PHYSICO – CHEMICAL ANALYSIS OF WATER SAMPLES FROM LAKE TRZESIECKO

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