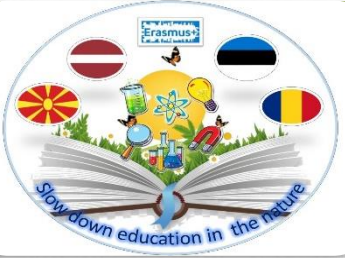


Good practice

Slow down education in the nature

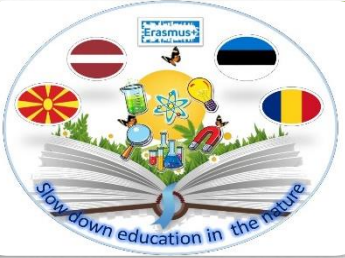
Erasmus+ KA229 project





General information

- **School** – Palade Põhikool
- **Country** – Estonia
- **Subject** – Biology- freshwater biota
- **Teachers** – Karin Poola



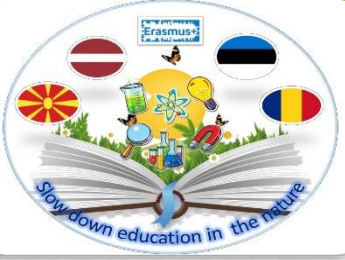
Outside learning-natural sciences

- **Materials needed**

- Fish nets with handles (for invertebrates and different living beings in finding in water)- whether large or small, called "aquarium fish nests" or sieves
- thermometer
- plastic trays (light colour) and a jar as an observation aquarium
- spoons or brushes for sorting
- loupe
- pen and writing pad
- paper for making notes.
- Microscope if possible

- **Surroundings**

- Freshwater bodies like river, lake, pond
- **Duration: 1-2 hours**

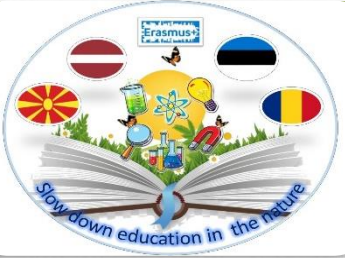


Outside learning-natural sciences

- **Materials needed**

1. Fish nets with handlas (big and small)
2. Thermometer
3. Plastic trays (ligh colour), jar
4. Spoons or brushes for sorting
5. Loupe
6. Pen and writing bad
7. Paper for making notes.
8. Microscope if possible

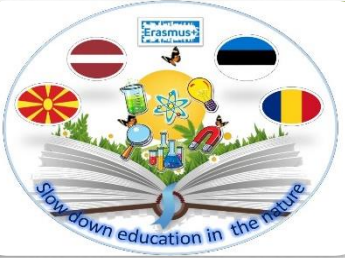




Observation of fresh water biota

Aims

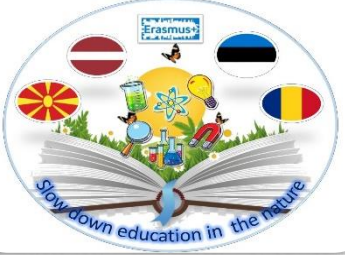
- Gaining knowledge about different biota in freshwater
- Increasing practical fieldwork at the water bodies
- Developing 8 science skills in students (**Observing, Classifying, Quantifying, Predicting, Controlling variables, Interpreting, Communicating, Forming conclusions**)
- Gaining knowledge about aquatic invertebrates and amphibians
- Collecting and saving data for future study



Activity 1

Introduction:

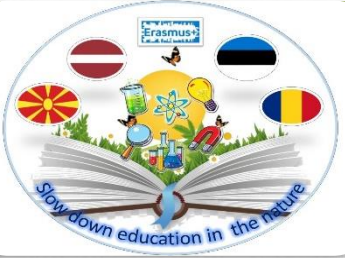
- This lesson is intended for practical fieldwork at freshwater bodies to observe and learn about aquatic invertebrates, amphibians living in freshwater and to develop nature observation skills.
- In the beginning of the lesson the Biology teacher describe the working process and safety rules. Also make an introduction to the topic.
- The students make practical fieldwork at the water reservoir (lake, river, pond), make observation, collecting information, make, notes and compare their results with ohter students.
- Freshwater life in lakes, rivers, ponds and streams is very diverse: from small protozoa, plankton and invertebrates to plants and vertebrate mammals.



Activity 2

- Making groups from 4-5 students
- Prepare your containers with the same water where you catching the living beings from the water
- Using fishing nest catch from the water invertebrates and amphibians from different habitats (between plants, muddy and sandy bottoms, open water). When catching, it is important to take into account that the water body is a habitat for many animals and plants, so care should be taken.

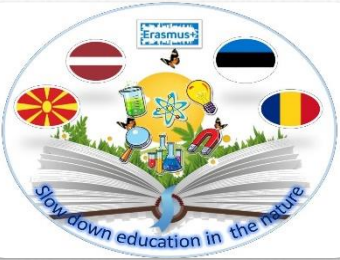




Activity 3

- Place the contents of the nest in your container and sort with a spoon or brushes all your catch into containers or into observation aquarium by species (like insects, invertebrates and amphibians or order by common characteristics etc). For the observation aquarium is suitable also a transparent plastic aquarium or a jar. Use a magnifying glass to observe small creatures and insects.





Activity 3

Fulfill the worksheet:

WORKSHEET

1. Which freshwater invertebrates or amphibians did you find in the water?

.....
.....
.....

2. Draw and describe the 3 freshwater aquatic animals found

Drawing			
Animal designation			
Modus of movement			
Bodyshape, size			
Head, eyes			
Body colour			
Wings			
Legs			
Body extensions			

3. What other observations did you make by the pond? Did you see other animals and birds?

Describe 1-2 of the most interesting observations.

.....
.....
.....
.....

4. Water properties and aquatic plants

Water properties and aquatic plants (as oxygen producers) are also important in the aquatic ecosystem. Draw a line to the appropriate answer, if necessary add the required answer.

1. Is the observed water body rich in vegetation? Are there plants: abundant, average, few?
.....
2. Is the surface of the water body covered with a green layer: algae or duckweed (abundant, medium, few).....
3. Can you see the floating plants: **pond-lily** (*Nuphar*), **water-lily** (*Nymphaea alba*), **potamogeton/ "river neighbor"** (*Potamogeton*),.....
4. Are there plants grow on the pond side: reed, bulrush, water horsetail or swamp horsetail?.....
5. Can you see the plants growing inside the water? (abundant, average, few):
.....

Measure or estimate the length of the smallest and largest or longest plant.

The smallest plant:.....
The longest plant:

5. Water temperature and color

What is the water temperature?.....

What is the color of the water?.....

6. Sort the animals in order of size

Indicate size (mm or cm) and name of animal (if known)

Which 2 are the largest?.....

Which 2 are the smallest?.....

What is the most peculiar shape?.....

Which has the brightest colour?.....

It is a good idea to use a multi-compartment tray (such as a candy box-type plastic tray) or small trays to accomplish this task.

7. Evaluate the purity of the water

Do you think that the water body you researched is clean or polluted (rubbish, water blooms, oil slicks, dead animals, etc.)? Justify/explain. Why is it necessary to protect water bodies?

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