



LESSON PLAN

TITLE: MARSH PLANTS OF THE LJUBLJANA MARSHES

DURATION: 6 lessons

MAIN SUBJECT: NATURAL SCIENCES (BIOLOGY)

GRADE LEVEL: 6th grade

LEARNING OBJECTIVES: The vegetation of the Ljubljana Marshes has changed greatly in the last 4000 years. The marsh plants are disappearing from their natural environment because of human interference and influence. Therefore, it is important to raise awareness about this topic. Students recognize and learn about the predominant plants of the marshes. They learn to use plant identification keys, recognize plant organs/systems and raise the awareness of biotic diversity.

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MARSH PLANTS OF THE LJUBLJANA MARSHES

WHERE: IN THE CLASSROOM (INDOORS)			
METHODS: quiz, question-answer, observing, sketching/drawing, describing			
WHAT?	HOW?	WHY?	LEARNING OBJECTIVES
SEED PLANT	<p>We use the application Kahoot to revise the structure of plants (prior knowledge).</p> <p>If needed, students can do the quiz once more.</p> <p>They answer the questions:</p> <ul style="list-style-type: none"> - Name a few plants. - What is similar/what characteristics do they have? - How do they differ from one another? - What do we call the plants that reproduce by seeds? <p>They observe the bean seed. They search for the component parts.</p> <p>They draw the parts and mark the components.</p>	<p>The application Kahoot is used as a motivation element. We use it to find out the students' prior knowledge, motivate them to think and prepare them to learn something new.</p> <p>By asking questions, we want to find out the prior knowledge of the students, clarify the problem and interpretation as well as to explain what we want to achieve.</p> <p>Seed plants are plants with developed leaves, stems and roots. In their cones or flowers, we can find seed codes, which from the seeds develop/are formed.</p> <p>We revise the structure of the seed because we are mostly dealing with and learning about more developed plants of the Ljubljana marshes.</p>	<p>Students:</p> <ul style="list-style-type: none"> - learn about, understand basic scientific concepts and nature concepts, and use them when explaining natural phenomena and processes in the environment, - use basic professional terminology when describing objects, phenomena, processes and laws, - learn about the characteristics of gymnosperms and angiosperms, - become aware of the fact that species are joined in larger groups, - describe the functions of the seeds.

WHERE: FIELDWORK (OUTDOORS)			
METHODS: observation, question-answer, discussion, reporting, problem solving, sketching/drawing, lecture-given by a professional (community based), analysing/inquiry			
WHAT?	HOW?	WHY?	LEARNING OBJECTIVES
HISTORY OF THE LJUBLJANA MARSHEs	<p>We look at the model of the crannog settlement.</p> <p>GROUP WORK: they answer the questions:</p> <ul style="list-style-type: none"> - Who built such settlements? - What were the people called? - Who were the Crannogs? - Where did they live? - How did they get the name? - What did they do for living? - How are the marshes formed? - What did it look like in the past (the marshes)? <p>GROUP WORK: Choose the reporter. They report the answers. They all discuss the answers.</p> <p>(pictures 1, 2)</p>	<p>Teachers observe the learning process and give feedback. We want students to strengthen their metacognitive processes and skills.</p> <p>By performing the tasks, students link the topic cross-curricularly (History, Geography).</p> <p>By asking questions, we want to enlighten and clear up the problem, interpretation and explanation: what we want to achieve; generalization and we define the terms and concepts.</p>	<p>Students:</p> <ul style="list-style-type: none"> - develop skills of time and spatial perception, - develop skills of coming to conclusions and forming their opinions, points of view, original suggestions and solutions, - develop susceptibility for different views on history and interpretation of history, understanding the reasons for their appearance, - assess the importance of preserving and protecting Slovene, European and world cultural heritage and environment/nature, - make conclusions about the differences in the ways of life in different periods of prehistory on Slovene territory.

<p>SEED PLANTS OF THE LJUBLJANA MARSHES</p>	<p>GROUP WORK: Students get plant identification keys. They head to specific areas in groups to find the plants:</p> <ul style="list-style-type: none"> - heather (<i>Erica</i> sp.), - peat moss (<i>Sphagnum</i> sp.), - birch (<i>Betula pendula</i>), - red pine (<i>Pinus sylvestris</i>), - arum lily (<i>Calla palustris</i>), - marsh horsetail (<i>Equisetum palustre</i>), - yellow iris (<i>Iris pseudacorus</i>), - bulrush (<i>Typha latifolia</i>), - snake's head fritillary (<i>Fritillaria meleagris</i>) - beech (<i>Fagus sylvatica</i>), - silver fir (<i>Abies alba</i>), - sweet chestnut (<i>Castanea sativa</i>). <p>(pictures 3, 4, 5, 6)</p> <p>Students learn about some protected species of plants of the</p>	<p>Teachers:</p> <ul style="list-style-type: none"> - provide instructions for the fieldwork, - observe the process, group work, - help students if needed, - provide feedback. <p>Students learn by observing and experimenting. Experiential learning is an approach where the theory and practice/experience connect. The major role has personal experience. Experiential learning states that we learn best when we do things ourselves -learning by doing, (Garvas 2010) Experience itself does not enable and bring new results and findings if we do not think about them and connect them with the knowledge, theory and thinking of other people. Experiential learning brings direct connection with the phenomenon and reactions in a real life situation. It is no longer only thinking about the phenomenon or thinking about what we would do in a certain situation.</p>	<p>Students:</p> <ul style="list-style-type: none"> - gather, analyse and assess data from different sources, - are able to judge, when the information is needed, - observe intentionally, write down and use observations/measurements as a source of data, - develop experimental skills and methods of research, - develop standpoints, opinions and relations, - are aware of the value and sensitivity of the natural and anthropogenic environment, developing positive relationship, responsibility to nature and respect for all life forms, - are able to recognize and understand the problems connected with the environment, participate actively and with responsibility in solving the
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	<p>Ljubljana marshes (guidance by experts):</p> <ul style="list-style-type: none"> - summer snowflake (<i>Leucojum aestivum</i>), 	<p>Experiential learning is based on actual personal experience and every person starts experiencing something new by already having prior knowledge, former</p>	<p>problems and contribute to sustainable development,</p> <ul style="list-style-type: none"> - recognize and prevent dangers in taking care of our own health as well as the health of others,
	<ul style="list-style-type: none"> - round-leaved sundew (<i>Drosera rotundifolia</i>). <p>(pictures 7, 8)</p> <p>They sketch/draw the plants with precision.</p> <p>Students learn about the invasive plant species of the Ljubljana marshes (guidance by experts):</p> <ul style="list-style-type: none"> - giant goldenrod (<i>Solidago</i> spp.), - daisy fleabane (<i>Erigeron annuus</i>), - Japanese knotweed (<i>Fallopia japonica</i>). <p>(picture 9)</p>	<p>experience, their theories and their personalities. That is why every situation may be a completely different experience for different people. Everyone experiences every situation in a different way, based on his/her prior experience (Garvas, 2010). An important part of learning is precise observation. In learning with observing or learning with models, we learn without active listening, verbal explanation or encouragement. In this process of observing students direct their motivation, pay attention, they remember, analyse, and make decisions. We check the sketches and drawings, give advice on what special attention should be paid, if necessary. It is important to be and become aware of the fact how dangerous it is to</p>	<ul style="list-style-type: none"> - use basic criteria for classifying plants, - classify the species/plants of the Ljubljana Marshes by using plant identification keys, - learn about the differences and similarities among the seed plants, - learn about the ecosystem which consists of inanimate elements of environment and population, all living together, - learn about the meaning and different useful aspects of plants for people and environment, - learn about the meaning of biodiversity for the stability of the ecosystem. Biodiversity is preserved by directly protecting the nature and biosphere, by natural usage of the landscape and

		<p>import non-native species in our environment. These plants have many negative ecological and economic effects on the environment.</p>	<p>sustainable development, especially in protected areas</p>
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WHERE: IN THE CLASSROOM (INDOORS)			
WHAT?	HOW?	WHY?	LEARNING OBJECTIVES
<p>EVALUATION</p>	<p>Students think about, discuss what they have learned, found out.</p> <p>The knowledge is checked by using the application quizziz.com Self-reflection. Using reflexion the students have to remember or write down one word which describes the whole learning process. This is also used to describe their results and findings.</p>	<p>Evaluation is an important part of the learning process. By using it, we have to find and encourage inner reasons to reach the same LEARNING OBJECTIVES/conclusions. Evaluation has a decisive impact on professional development of students because the conscience of the qualitative part is the most distinctive virtue. Students refresh the knowledge of the plants typical of the Ljubljana Marshes. Self-reflection is used to discover new challenges, find out hidden potential and understand ourselves better as well as our relationship to nature and environment.</p>	<p>Students:</p> <ul style="list-style-type: none"> - revise and refresh their knowledge about basic plant organs, leaves, stems and roots, - revise and refresh their knowledge about the tasks of different plant organs, - check the knowledge based on the minimum and fundamental standards of knowledge, - list and name the most common plants of the Ljubljana Marshes, - learn about the dangers of the invasive species.



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TEACHERS' REFLECTION

In the last few years, we, people, have lost our contact with nature and our environment. We spend most of our days inside and make trips in the nature only occasionally. On the other hand, we have greatly changed the environment we live in by interfering and influencing natural processes. These days the marshes all over the world are in the firing line due to global warming and the rising need for agricultural land. In central Slovenia, we can find one of the original marshes in Europe, the Ljubljana Marshes, which is a part of the Ljubljana Marshes Nature Park.

As teachers, we are responsible not only for teaching but also for upbringing of young generations. We can see that the contact with nature is poor especially with the youngest students. Children cannot observe the nature, they do not learn from it. Learning by doing, experimenting, collaborating, solving problems are the key activities, which enable students to get long-lasting knowledge. As the students were learning about the plants and plant organs, we contacted the world's famous botanists, dr. Jože Bavcon and dr. Blanka Ravnjak, who are members of the Biotechnical Faculty, to broaden our knowledge in this field. They helped us learn about the plant organs and systems and upgrade our knowledge gained during our indoor lessons. We took a walk across the Ljubljana Marshes with them and they helped us recognize and learn about some of the rarest species found in this moist area. The students connected their knowledge of geography and history with the new findings in the field of biology. An important part of their education is the knowledge about the crannog people who inhabited this area and are an essential part of Slovene history and world society. Cross curricular learning enables students to use thinking skills to different learning contexts, breaking down subject barriers and applying their knowledge from one subject to solve the tasks for another subject or subjects; it is fusion. It offers students deeper understanding of what they are learning and why.

Learning about the plants outdoors enabled the students to develop the skills such as observation, use of plant identification keys, precise sketching, but mostly being a part of nature, enjoying their environment and feeling the nature with all their senses. If the children feel the nature, they will be able to understand it. Human attitude towards nature has been step motherly in the last years. The damage done is in some parts irreversible. Therefore, it is of great importance we raise sensitive human beings who will care for all living creatures.

Picture 1:



Picture 2:



Picture 3:



Picture 4:



Picture 5:



Picture 6:



Picture 7:



Picture 8:



Picture 9:





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