

## 15.Natural colors for dyeing of fabrics and yarns



Title	Natural colors for dyeing of fabrics and yarns
Content/ Subject areas	The project is planned for 4 lessons (40 min.) It integrates many subjects: chemistry, biology, visual art, housekeeping, history, languages, IT and economics
Target group	16 -17 year old secondary school students. The participants are 12 students, who are divided into 4 groups
Learning objectives / competences	<p>The goal is to explore natural colours, find out the information about their historical use, geographical location, features etc. and to apply the acquired knowledge in practical work – dyeing yarn and fabric. During 4 lessons students will master basic competences as follows:</p> <ul style="list-style-type: none"> <li>■ <b>Communication in mother tongue</b> - students will socialize and communicate with each other while working in groups. They will try to find a compromise, learn to listen to each other, to tolerate each other's opinion, to work in the team, to present their findings and results to other students</li> <li>■ <b>Scientific and technological competence</b>- competence in science refers to the students 'ability and willingness to use the knowledge in order to identify questions and to draw evidence-based conclusions, but competence in technology is viewed as the application of that knowledge. Before practical classes students study scientific literature and the obtained information is applied in their practical work.</li> <li>■ <b>Digital skills</b> -in the modern world digital skills are highly valued, therefore students are asked to apply them when searching for the information or preparing presentations.</li> <li>■ <b>Learning to learn</b> – students develop the ability to pursue and persist in learning, to organise their own learning, including through effective management of time and information, both individually and in groups. Students learn to identify available opportunities and master the ability to overcome obstacles in order to learn successfully.</li> <li>■ <b>Sense of initiative and entrepreneurship</b>- students develops their ability to turn ideas into action. Practical work includes creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve the goals.</li> <li>■ <b>Cultural awareness</b> – students learn about the life in the past, culture and history</li> <li>■ <b>Creativity</b> – it is developed through practical work and is one of the leading competences, because it helps to generate new ideas, find the most suitable solutions and analyse the situation.</li> </ul>
Description of overall activity	The project is divided into two main parts. The first one is a theoretical part, but during the second part students apply their theoretical knowledge into practical work. They dye fabric and yarn in chemistry laboratory. In the result of their work the original pieces of art are created, which are afterwards displayed in the exhibition.
Description of the process and teaching/ learning strategies used	During the first lesson students explore the literature about natural colours, raw materials and their use nowadays and in ancient times. Students use internet resources, books and encyclopaedias. Each group is given a different source. In the second part of the first lesson students compare the

	<p>information they have found. During the second lesson students explore school surrounding and gather the raw materials, which can be used for dyeing. When it has been done, they bring the materials to the class and compare their findings.</p> <p>In the beginning of the third lesson students get ready for practical work, preparing the necessary materials and equipment. They start doing practical work – dyeing of fabric using the materials they have gathered.</p> <p>The third lesson is dedicated to the presentation of creative works.</p>
<p>Evaluation/ types of assessment</p>	<p>The evaluation of work has 3 positions. Firstly, the work is evaluated by the group itself. Then all four groups evaluate each other and the teacher also evaluates each group. Each position evaluates the work according to the common criteria. Then all the evaluation positions are summed together. The criteria, which is taken into consideration in the evaluation process, are as follows:</p> <ul style="list-style-type: none"> <li>■ Presentation of the theoretical material (1- 10 points)</li> <li>■ The selected raw materials (1-10)</li> <li>■ Dying process (1-10)</li> <li>■ Team work (1-10)</li> <li>■ The outcomes (1-10)</li> <li>■ Presentation of practical work (1-10)</li> <li>■ Creativity (1-10)</li> </ul> <p>Then all the evaluation positions are summed together and the average mark is calculated.</p>
<p>Materials and tools</p>	<p>For this project it is necessary to have natural colours Linen or cotton fabric, wool, all the tools necessary for dyeing, Computers, tablets, projector</p>
<p>Timing and learning environment</p>	<p>Timing: 4 lessons (4 x 40 min), but it might take more in some groups. Environment: school yard, school surrounding, classroom and chemistry laboratory</p>
<p>Conclusion</p>	<p>The project is innovative because:</p> <ul style="list-style-type: none"> <li>- Many subject are integrated into learning process</li> <li>- Students develop and acquire many competences such as the work with literature sources, practical work, research work etc.</li> <li>- The development of dying with natural colours might solve some environmental problems in the world.</li> <li>- Naturally dyed clothes might be worn by people, who have allergic reaction to chemically dyed materials.</li> </ul>
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