

16. PH level in everyday liquids



Title	PH level in everyday liquids
Content/ Subject areas	<p>Chemistry - the relation of chemistry with real life, chemistry around us, in our everyday life.</p> <p>Technologies - the application opportunities of smart phones, computer science, multimedia.</p> <p>Art and language – preparing of presentation/ film.</p>
Target group	<p>15-16 years old students. The whole class can be involved in this activity. Students may work in groups</p>
Learning objectives / competences	<p>The goal is to measure PH level in everyday liquids</p> <p>Students learn to apply practically their knowledge and measure PH level.</p> <p>Students learn to overcome difficulties and to understand when it is not possible to measure PH level.</p> <p>They develop critical thinking</p> <p>Students learn to plan their activities in order to reach the goal.</p>
Description of overall activity	<p>During the Chemistry class students learn the theoretical material about PH level. At the end of the lesson students are introduced to their homework. Students draw up an action scenario/plan. Students plan how they are going to measure PH level in liquids that they can find at home, elaborate the plan of their activities and film them, process the obtained video and data and present them. Students carry out the work at home. They use video cameras, smart phones or mobile phones to film the PH measuring process and they use computers to summarize the obtained results.</p> <p>The filmed materials, findings and measuring results are presented in the class. They are evaluated by teacher(s).</p>
Description of the process and teaching/ learning strategies used	<p>The main objective of the work: using common household items, substances, dishes and indicator given by teacher acquire skills to prepare and carry out chemical experiments, demonstrating their progress and results to viewers using their mobile phone cameras. Student must prepare the samples of household substances necessary for the experiment. They have to choose appropriate dishes, find the right position for recording and filming and provide monitoring quality results, etc., as well as they have to develop a scenario. In this way, learning chemistry as a science of compulsory teaching content, students do it creatively. During the process students learn to work with the video recording device (smartphone, for example), promote public speaking skills as well as learn to make observations and draw conclusions. Parallel to this, students also gain knowledge of the acid / base balance in nature and in species and substances of everyday life and they learn about the dual nature of the world in general.</p> <p>All the experimental process (according to standard) is divided into the following phases:</p> <ol style="list-style-type: none"> 1) identify no less than five different liquids which are found in household environment (max - 10); 2) choose the dishes, where substance samples will be placed in the experiment, taking into account that they must be observed from the side scan;

	<p>3) to plan the order and manner in which materials will be connected to the indicator;</p> <p>4) conduct a demonstration scenario by providing filming shots and demonstrator's comments, emphasizing the attractiveness and grabbing the viewer's attention;</p> <p>5) doing experiments without filming activities and without testing visual effects;</p> <p>6) Conducting experiments with filming and comments. Titters and special effects are at the discretion of each student.</p> <p>Prior to the activity students were demonstrated experiments with chemical substances and laboratory glassware, therefore, they are familiar with the indicators' colour change in different environments - hence, they have a theoretical base. The result of students' independent work – the connection of the information gained in the laboratory and classroom with real life, emphasizing the fact that chemistry is not torn apart, but, on the contrary, forms part of our everyday life. The created film can be shown to classmates and their relatives, friends and acquaintances.</p>
<p>Evaluation/ types of assessment</p>	<p>A student work is evaluated by teacher(s).The evaluation of work is done according to the common criteria. Students are mainly evaluated from the Chemistry perspective. But there are things which were taken into account: the abilities to use computers in video processing process, complexity and esthetical composition of presentation, attractiveness etc.</p>
<p>Materials and tools</p>	<p>For this project it is necessary to have indicators, mobile device, computers with software necessary for video processing, projector.</p>
<p>Timing and learning environment</p>	<p>Timing: 2 lessons (2 x 40 min) in one week - one for theoretical part and one for presentations. One week between - the biggest part - students' individual work out of lessons.</p> <p>Environment: classroom, can be chemistry laboratory, home</p>
<p>Conclusion</p>	<p>The project is innovative because:</p> <ul style="list-style-type: none"> - It involves students practically into process - Students work and acquire simultaneously many skills, such as chemistry, computer technologies, art. - Students develop research skills, film producer skills, critical thinking
<p>Contacts</p>	<p>Vineta Pavlova, Eastern Latvia Secondary School of Technologies English language teacher, project coordinator e-mail: vineta.pavlova@ru.lv</p>

