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# METHODOLOGY OF ORGANIZING CHEMISTRY LESSONS THROUGH DESIGN

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**Abstract**
The article presents a methodology for organizing chemistry lessons in a school chemistry course through design. It provides methodological recommendations for increasing students' interest in chemistry, conducting chemistry lessons in a meaningful, understandable, and concrete way with real-life examples.
Also; the article studies the stages of forming students' thinking about chemistry through the methodology of conducting experiments with students, understanding the experiments that allow them to perform them in a room.

## Introduction

In lessons organized on the basis of new pedagogical technologies, laboratory exercises are organized taking into account the intellectual abilities of students, their speech culture, and their friendly and cooperative relationships, which leads to the awakening of a sense of mutual assistance, friendship, and cooperation in students, and thereby facilitates their acquisition of skills and abilities. A set of methods of action that provide students with the ability to independently organize and implement educational activities; independently set goals, search for the necessary tools and effectively use them as a means of solving problems, control the process. The student selects methods of activity based on real life situations to easily achieve a solution to the problem [1].

Conducting laboratory and practical classes primarily serves to reinforce the theoretical knowledge students have gained in this subject. Experiments involving various qualitative and quantitative reactions accompanied by changes in color and quantity, precipitation, and gas evolution naturally arouse a great interest in science in them. The availability of various chemical containers and chemicals and the teacher's ability to use them rationally are essential conditions for conducting practical training and laboratory work. Performing chemical experiments in laboratory classes is one of the most necessary conditions for the successful study of chemistry, and it serves to consolidate theoretical educational material in the minds of students.

The teacher can give oral or written instructions on the study of educational material based on the necessary demonstration tools in the lesson [2]. In the process of completing the tasks, demonstrations are combined with practical methods. The appropriate and effective use of demonstration methods in the teaching process has the following advantages:

1.STEAM exhibitions develop visual and figurative thinking and activate cognitive activity.







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2. The theoretical material studied in chemistry lessons allows for modeling phenomena and processes that cannot be observed in class, and allows for a more complete understanding of the topic based on the model.

3. STEAM exhibitions allow for the application of theoretical knowledge in practice, clarification of the studied phenomena based on diagrams and tables, and a more extensive study. In addition to exhibitions in the form of pictures, the composition of demonstration methods includes screen tools, modern computer programs, in particular, the following visual tools, electronic textbooks, multimedia, and the presentation of the content of the lesson.

STEAM practical classes develop the following skills:

1. Apply the theoretical knowledge acquired by students in practice;
2. Develop creative abilities;
3. Prepare for life;
4. Provide opportunities to develop professional skills related to chemistry.

This method is used in the teaching process in combination with demonstration, problem, and verbal methods. This group of methods includes observation, organization and conduct of experiments, methods of practical work, observation and conduct of experiments, explanation of the course of practical training to students, drawing up a plan for practical work, monitoring the implementation of practical work tasks, analysis of the results of task implementation, self-control during the process, completion and formalization of practical work, observation and experiments.

In each lesson, and especially during practical exercises, the teacher should introduce students to modern scientific and technical innovations and, whenever possible, show them experiments related to these innovations. New information technologies can be effectively used in traditional lessons, including practical exercises in chemistry, laboratory work, and demonstration experiments [3].

The teacher may not always be able to carry out the experiment he wants, because the material base of the laboratory does not always meet the requirements of a modern chemistry laboratory. Therefore, the use of computer tools here can help to effectively solve this problem. The advantage of students working with software in chemistry lessons organized based on STEAM education is that such activities serve to stimulate research and creative activity.

The role of practical exercises in STEAM education is invaluable. The main reason for this is that the student must know why the experiment is being performed and what problem can be determined on the basis of the experiment [4]. The student must study substances using instruments and reagents and, as a result, be able to draw conclusions from the results of the experiment based on their theoretical concepts. Conducting laboratory exercises is important in connecting students' theoretical knowledge with practice, clarifying it, and forming and developing the learning skills specified in the program.

Conducting laboratory and practical classes, first of all, serves to consolidate the theoretical knowledge of students in this subject, and experiments with the fact that various qualitative and quantitative reactions are accompanied by changes in color and quantity, precipitation and gas evolution naturally arouse great interest in science in them. The availability of various

chemical containers, chemicals and the teacher's ability to use them rationally are necessary conditions for conducting practical classes and laboratory work.

The purpose of laboratory experiments is to acquire new knowledge and study new material. Practical exercises are carried out after studying the subject and lead to the improvement and consolidation of knowledge, the formation of practical skills and the improvement of the formed skills and qualifications, are a type of control. The implementation of the student experiment takes place in the following stages:

1. Understanding the purpose of the experiment.
2. Studying substances.
3. Creating devices from chemical containers and tools.
4. Performing the experiment.
5. Analyzing the results of the experiment and drawing conclusions.
6. Explaining the results obtained and writing reaction equations.
7. Writing a report.

**“Experience of making foam”**

Method 1. Such foam can be given not only in chemistry lessons at school, but also as a homework assignment in the form of a project assignment. For this, we need a glass bottle, a small amount of fermented yeast solution, liquid soap, food coloring (to make the foam color beautiful), and a 70% solution of acetic acid.

The practical exercise is very simple and safe for those around you. All you need to do is follow the required sequence when mixing the ingredients. The amount of the necessary products is increased according to the size of the container in which the experiment is being carried out.

Method 2. In this method, we need a highly concentrated solution of potassium permanganate, liquid soap, and a 3% solution of hydrogen peroxide, which is sold in pharmacies. We put these reagents in the bottle in the order given above. Hydrogen peroxide is added at the end. This will produce a much larger amount of foam than in experiment 1. If food coloring is used, it will be possible to produce foam of different colors.

The number of products is increased in accordance with the size of the container in which the experiment is performed. The experiment is safe, completely harmless to the student's health. However, achieving a hundred percent result as a result of this experiment will increase the student's self-confidence and help him draw the necessary conclusions about the properties of chemicals.

**“Inflating a balloon without air”**

To perform this experiment, we need baking soda, acetic acid, a flask, and a balloon. We put 70% acetic acid in the flask. And baking soda is put in the balloon. The balloon is put on the mouth of the flask. In this case, the balloon inflates due to the carbon dioxide released as a result of the reaction of acid and soda.







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**Determining starch in bread**

A loaf of bread is broken into pieces and soaked in water. We mix and remove the water from the bread. If we drop 15 drops of iodine into the remaining liquid, its color will change. This confirms the presence of starch in the bread.

**Iodized salt**

We know that iodized salt is available in stores. Iodine is the most important microelement. You can easily determine whether salt contains iodine by conducting an experiment: put a teaspoon of salt in a glass, pour a teaspoon of water on top and mix. Then add half a teaspoon of acetic acid and hydrogen peroxide solution to the glass. After a few minutes, sprinkle a small amount of starch into the glass. If the table salt is iodized, the starch will turn blue and gradually turn a dark purple color with a bluish tint. Potassium iodide KI is added to iodized salt. Hydrogen peroxide H2 reacts with iodine ions in the solution, displacing pure iodine, which reacts with starch, turning it blue.

**Writing a secret letter from a lemon**

We squeeze the juice of a lemon onto a white piece of paper and write the word “CHEMISTRY”. In this case, the writing will be almost invisible when it dries. After some time, if we heat the paper over a flame, the writing will become visible on the surface of the paper.

The STEAM project method in chemistry lessons is one of the main components of a modern teaching method that allows the teacher to objectively evaluate the learning process, work in groups with students on the basis of mutual cooperation, and the student to creatively approach planning, organizing and controlling his activities in completing educational tasks [5].

The development of society is placing new demands on school education, different from the previous ones. Today's demand is to educate a generation that is active, capable of creative self-development, independent, able to correctly choose the means and methods for solving various problems. The famous Chinese philosopher Confucius also said: "I hear and forget, I see and remember, I do and understand." Research activities based on STEAM education are based on independence, but the teacher helps to identify and solve problems, and in the process of finding solutions, helps to improve the worldview in the educational process.

**REFERENCES**

1. Eremeevskaya I.D., Kovel M.I., Zorina V.L. Zadaniya po khimii dlya razvitiya u uchashchixsya poznavatelnyx universalnyx uchebnyx deystviy sredstami posoba dialecticheskogo obucheniya (uchebno-metodicheskoe posobie) // Mejdunarodnyi zurnal eksperimentalnogo obrazovaniya. 2015. No. 5-2. S. 193-194.

2. Anisimova, T.I. Podgotovka pedagogov dlya STEAM-obrazovannya / T.I.Anisimova, F.M.Sabirova, O.V.Shatunova // Vysshee obrazovanie segodnya. - 2019. - S. 31 - 35.

3. Volosovets, T.V. STEM education for preschool and junior high school children. Partial modular program of development of intellectual abilities and processes of cognitive activity

and creativity in scientific and technical creativity: educational program / T.V. Volosovets, V.A. Markova, S.A. Averin. - M.: Binom. Laboratory Science, 2019. - 112 p. 136. Trainev V.A. Delovye igry v uchebnom protsesse: Metodologiya razrabotki i praktika provenetiya//-M.:Izd.dom Dashkov i K.-2005.-360 p.

4. Khasanova H.N. "Using modern innovative methods in improving chemistry teaching". Study guide. Navoi". No. 3. 2022. 112 p

5. Khasanova H., M.D. Safarovna, D.K. Ahadova. Modern methods for filling knowledge gaps in organic chemistry. Region International Conference on sustainable development and economics 840 USA, Georgia, June 24-25, 2019. -P. 244-246.







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