DIDACTIC FUNCTIONS AND SAFETY RULES OF CONDUCTING EXPERIMENTS IN CHEMISTRY LESSONS

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Abstract.

This article highlights the theoretical and practical aspects of the didactic functions of conducting experiments in chemistry lessons and adhering to safety rules during their implementation. Experiments play an important role in reinforcing theoretical knowledge in practice, developing students' scientific research skills, and increasing their interest in the subject. The paper also elaborates on the types of experiments, methods for their effective organization, and methodological recommendations to ensure laboratory safety.

Keywords: Chemistry teaching methodology, conducting experiments, didactic function, laboratory work, technical safety, protective equipment, observation skills, interactive methods, learning motivation, methodological recommendations.

Аннотация.

В данной статье раскрыты теоретические и практические аспекты дидактических функций проведения экспериментов на уроках химии и соблюдения правил техники безопасности при их выполнении. Эксперименты играют важную роль в закреплении теоретических знаний на практике, развитии научно-исследовательских навыков учащихся и повышении их интереса к предмету. В статье также подробно рассмотрены виды экспериментов, методы их эффективной организации, а также методические рекомендации по обеспечению безопасности в лаборатории.

Ключевые слова: методика преподавания химии, проведение экспериментов, дидактическая функция, лабораторные работы, техника безопасности, средства защиты, наблюдательность, интерактивные методы, учебная мотивация, методические рекомендации.

Introduction

A key feature of chemistry is that theoretical knowledge is practically demonstrated through experiments, making it more understandable for students. Therefore, conducting experiments in chemistry lessons not only increases interest in the subject but also plays a significant role in developing competencies such as scientific thinking, observation, and analytical reasoning. Nowadays, teachers are required not only to deliver traditional knowledge but also to organize lessons effectively based on modern didactic principles.

Conducting experiments in chemistry has distinctive didactic functions. Through experiments, students consolidate theoretical knowledge, directly observe the properties of substances, and draw their own conclusions. However, it is crucial to strictly follow safety rules during experiments. This is a fundamental requirement for protecting the health of both teachers and students.

Main Part

Chemistry is based on theoretical concepts. However, these concepts often remain abstract in students' minds. Experiments prove theoretical knowledge in practice and make it more understandable. Therefore, experiments:

-concretize abstract concepts;

-activate students' attention;

-increase interest in sciences;

-develop practical skills;

-foster independent research and observation abilities.

Experiments are an integral part of chemistry lessons, transforming students from passive listeners into active participants, fully aligning with the principle of interactivity in modern education. Experiments in chemistry lessons fulfill various didactic functions, which can be grouped as follows:

Explanatory function: The experiment facilitates understanding of new concepts or laws.

Reinforcing function: It consolidates theoretical knowledge in practice.

Control function: It helps assess students' knowledge and skills.

Educational function: It teaches students discipline, focus, and an appreciation for careful work.

Developmental function: It cultivates analytical thinking, research skills, observation, and drawing conclusions.

In addition, conducting experiments shapes students' scientific worldview and ecological awareness. The main types of experiments in chemistry lessons are:

Demonstration experiments: Performed by the teacher for the whole class, mainly used for explanation and introducing new topics.

Laboratory work: Students conduct experiments in groups or individually, developing practical skills and competencies.

Frontal experiments: All students perform the same experiment simultaneously.

Independent experiments: Students independently plan and conduct experiments on their own.

Demonstration experiments mainly serve to explain theoretical knowledge, while laboratory work develops practical skills.

Safety Rules for Conducting Experiments. Safety in the chemistry laboratory is extremely important. Failure to follow safety rules can lead to various injuries or fire hazards. Therefore, both students and teachers must adhere to the following general rules:

Before starting work:

a) Organize the workplace;

b) Prepare necessary equipment and materials;

c) Check hands and tools.

During work:

a) Do not mix chemicals without permission;

b) Be cautious with flammable substances;

c) Handle hot equipment and reagents carefully;

d) Use protective equipment (goggles, gloves).

After completing work:

a) Clean the workplace;

b) Properly dispose of waste;

c) Wash hands with soap.

Before each experiment, students must be warned and given a brief safety briefing by the teacher.

Methodological Approaches to Ensuring Safety.

While conducting experiments, the teacher should not only control safety but also develop students' safe working habits. To do this:

Include safety symbols in textbooks and workbooks;

Display posters with safety rules in the laboratory;

Have students sign a safety log;

Conduct drills on actions in emergencies.

To organize the experiment process effectively and safely in practice, teachers can follow these recommendations:

Prepare for the experiment in advance;

Coordinate the experiment duration with the lesson plan;

Divide students into groups and provide each with sufficient equipment;

Prepare concise and clear instructions;

Conduct regular briefings on technical safety.

Conclusion

Conducting experiments in chemistry lessons is not just a means to engage students but is an essential method that fulfills deep didactic functions. Through experiments, students reinforce knowledge, acquire practical skills, and develop a clear understanding of theoretical concepts. At the same time, strict adherence to safety rules during experiments is the main responsibility of every teacher and student. A modern chemistry teacher must use innovative approaches, actively involve students in experiments, and teach them to work safely. Only in this way can experiments become not only an effective teaching tool but also a powerful pedagogical method that increases students' future trust in science and technology.

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