

THE ROLE AND IMPORTANCE OF DIDACTIC GAMES IN TEACHING CHEMISTRY

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Annotation

This article discusses the scientific and theoretical foundations of teaching chemistry based on didactic games, the role and types of didactic games in teaching chemistry, and the use of these games creatively to improve the effectiveness of chemistry education in general secondary schools. It elaborates on how didactic games help develop students' creative thinking skills. The purpose and procedure of applying these games in lessons are presented step by step. It also explains how these games can guide students toward creative thinking. Accordingly, didactic games fulfill the educational process's didactic functions—teaching, upbringing, and development—through their entertaining, instructive, and developmental features.

Keywords

Didactic, creativity, approaches, ability, education, method.

Introduction

Let's first discuss some didactic games. In this article, we recommend organizing lessons using games such as "Chemical Checkers," "Toponomic," and "The Chemist Himself is Interesting, and His Words Are Even More Interesting." The reason is that the modern educational process is characterized by humanization, focusing on the student's personality, developing good qualities, and forming a well-rounded individual. Therefore, playful forms of education, especially didactic games, are of particular importance. Didactic games allow students to develop attention and memory. Game tasks positively influence the development of ingenuity and quick thinking. Most didactic games require not only intellectual activity but also strong willpower, such as organization, perseverance, and the ability to follow rules.

Didactic games are tasks used to acquire knowledge by creating a playful situation in order to solve educational objectives in any subject. They enhance students' logical reasoning and ingenuity, as well as their interest in the subject and innovations. Such games have proven effective in chemistry education.

Unfortunately, many chemistry teachers in general secondary schools lack the skills to create and use these games effectively. Therefore, the proposed didactic games are designed for teaching chemistry in general secondary schools, with the main goal of revealing students' talents, interests, knowledge, individuality, developing creative and logical thinking, and fostering a culture of teamwork and communication.

The issue of teaching effectiveness is closely related to students' activity, independence, and conscious desire to study the fundamentals of the subject being learned, which arises from their cognitive motivation. Didactic games are an effective tool to stimulate interest in studying chemistry.

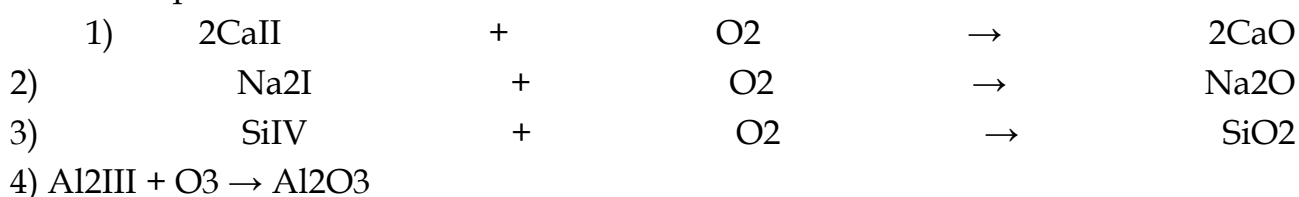
When selecting a game, the teacher should pay special attention to the lesson time, students' preparedness, and the content of the educational material. In implementing games in the learning process, methods such as discussion, demonstration, and practice can be used. At the end of the session, the results of the game are analyzed, and necessary recommendations are given to students. Thus, the use of pedagogical games in the educational process requires creativity, initiative, and professional skills from the teacher, which are key factors in improving lesson effectiveness. A distinctive feature of playful lessons is that they increase students' responsibility as both participants and organizers. Situations that are difficult to solve in regular lessons can be easily resolved through games, achieving positive results.

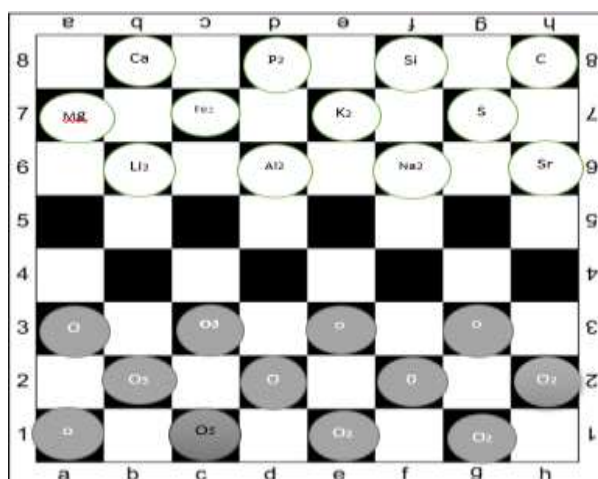
When choosing games, the teacher must know the class's and each student's individual abilities and interests and prepare them for participation in these games.

"Chemical Checkers" Game

The term "Chemical Checkers" comes from English. Using foreign words in each lesson increases students' interest in learning languages. This game is useful for understanding valency consciously. A checkerboard and 24 checker pieces (12 for each player) are used. On 12 pieces of one color, symbols of metals and nonmetals that form oxides are written, with their valencies indicated in Roman numerals. On the 12 pieces of the other color, the oxygen symbol is written, with the necessary indices and valency. The game is played between two students. To capture the opponent's piece, the sum of the valencies of metals or nonmetals must be divided by the valency of oxygen.

Examples:





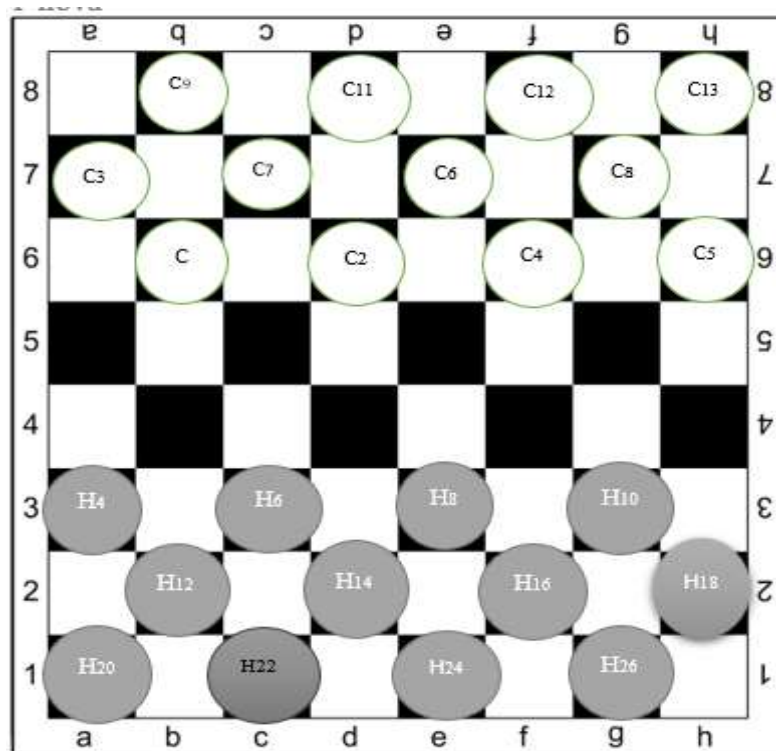
During the game, pieces can become “kings,” continuing like in traditional checkers. To make the game more engaging and ensure full understanding of valency, numbers from 1 to 12 are written on the bottom of the checker pieces. At the end of the game, students can count scores to determine the winner and loser.

After studying “Saturated and Unsaturated Hydrocarbons,” students’ knowledge can be checked using this game. Twelve checker pieces are marked with “C” (carbon) and twelve with “H” (hydrogen). The goal is to form saturated hydrocarbons. The winning student is graded and rewarded.

Checker

labels:

C C4 C2 C5 C3 C6 C7 C4 C8 C9 C2 C10
H4 H10 H6 H12 H16 H8 H H22 H14 H18 H20 H4



“Toponomic” Game

On pieces of paper of equal size, names of elements such as copper, gold, silver, tin, lead, iron, mercury, sulfur, carbon, zinc, arsenic, and antimony are written. The papers are mixed and placed face down on a table. Students must briefly explain the element they draw. For example: Gold – morning glow; Beryllium – sweet; Aluminum – alum; Argon – lazy, and so on.

Each participant may take up to five cards. If the student gives the correct explanation, they keep the card; if not, it is returned to the table. Each correct answer earns one point. The game can involve the entire group, and the student with the highest score wins.

The “Toponomic” game encourages students to read more materials beyond the textbook and become familiar with reference materials.

“The Chemist Himself is Interesting, and His Words Are Even More Interesting”

This didactic game is held in a humorous format. It encourages attentiveness, ingenuity, and cleverness among students. The class is divided into two teams for competition. The host asks them prepared questions, while the judging panel objectively evaluates the answers. Incomplete or incorrect answers do not receive points. The questions are prepared in advance under categories such as “Half Joke, Half Truth,” “Do You Know?,” “A Pinch from Every Field,” and “Hard to Believe, But True.”

Examples of questions:

1. What are “chemical corpses”? Who introduced this term into chemistry and why?
2. What is “Dutch chemists’ oil,” and why is it called that?
3. What is the “acid that enters with milk and leaves with life”?
4. Which organic acid is actually not an acid?

Answers:

1. N.D. Zelinsky tried to make paraffins reactive in chemical reactions, but eventually lamented that paraffins are “chemical corpses.”
2. In the history of chemistry, three Dutch researchers, experimenting with ethylene, discovered a new oily substance at the bottom of the reactor – this was the well-known dichloroethane, still called “Dutch chemists’ oil.”
3. It refers to lactic acid, found in milk. It is consumed through milk, and in processes like glycolysis and glycogenolysis, lactic acid is formed. The energy transformations involving it sustain life, which ceases when these reactions stop:

$$C_6H_{12}O_6 \rightarrow 2CH_3CH(OH)COOH$$
4. Phenol dissolves poorly in water (0.5–0.8%) but its solution is called carbolic acid.

Although not a real acid, it is an aromatic hydroxy compound (C₆H₅OH) with strong disinfectant properties.

This game can also integrate materials from biology, physics, geography, and other subjects, promoting interdisciplinary learning.

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