

## METHODS OF DEVELOPING LOGICAL THINKING IN MATHEMATICS LESSONS IN PRIMARY GRADES

*Raximova Dilshoda Xoliqberdiyevna*

*Master's student, 1st year, Shakhrisabz Pedagogical Institute  
[raximovadilshoda62@gmail.com](mailto:raximovadilshoda62@gmail.com)*

**Annotation:** This article analyzes methods for developing logical thinking in mathematics lessons in primary grades. It emphasizes the importance of using innovative methods to cultivate students' logical reasoning skills, enhance their problem-solving abilities, and foster independent thinking. The use of logical problems, interactive games, and modern pedagogical technologies in mathematics lessons can significantly boost students' interest and achievement.

**Keywords:** primary education, mathematics, logical thinking, innovative methods, pedagogical technologies, interactive learning.

### 1. INTRODUCTION

Developing logical thinking is one of the key tasks of today's educational system. In particular, fostering analytical thinking skills during the teaching of mathematics in primary grades holds great significance. Through logical thinking, students are not only able to solve mathematical problems but also analyze everyday challenges and find effective solutions.

To enhance logical thinking in mathematics education, teachers are required to use modern approaches and innovative methods. Today, the use of interactive technologies, game-based methods, problem-based learning, and information and communication tools can significantly increase students' engagement and improve their thinking abilities. This article thoroughly examines the effectiveness of such methods and their role in the educational process.

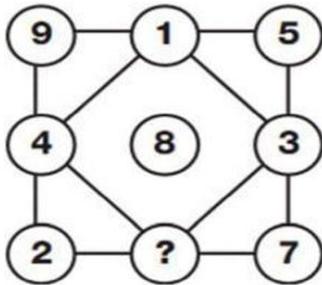
### 2. METHODS OF DEVELOPING LOGICAL THINKING

#### 2.1 Solving Logical Problems and Challenges

Logical problems help develop students' analytical thinking and problem-solving skills. Such tasks include puzzles, identifying mathematical patterns, and exercises that require logical reasoning. For example:

#### **Finding the logical sequence in numbers:**

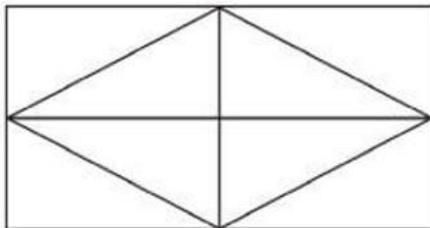
In the given task, students are asked to find the missing number in a logical sequence.



**Solution:** In this sequence, numbers from 1 to 9 are arranged, but the number 6 is missing. Thus, the missing number is 6.

#### Determining relationships between geometric shapes:

Students are asked to identify how many triangles are present in a given figure.



**Solution:** There are a total of 12 triangles in the figure.

#### Solving verbal mathematical problems:

**Problem:** Nodir has several friends. The sum of their ages is 48. After three years, the total will be 63. How many friends does Nodir have?

**Solution:**  $(63 - 48) \div 3 = 5$ . Thus, Nodir has 5 friends.

**Problem:** Sardor is 7 years older than Nodir but 10 years younger than Umid. If Jasur is 4 years younger than Umid, find the age difference between Nodir and Jasur.

**Solution:** Let Nodir's age be X. Sardor's age =  $X + 7$ .

Since Sardor is 10 years younger than Umid, Umid's age =  $X + 17$ .

Jasur's age = Umid's age - 4 =  $X + 13$ .

Thus, the age difference between Nodir (X) and Jasur ( $X + 13$ ) is 13 years.

Such exercises encourage students to develop mathematical thinking and independent reasoning. Logical problems also help students understand relationships, identify cause-and-effect patterns, and find alternative solutions in different situations.

## 2.2 Using Game Technologies

Incorporating game elements into lessons increases students' engagement and makes learning enjoyable. Effective game methods include:

- **"Who's the fastest?"** – The student who solves a given problem correctly in the shortest time wins.
- **"Mathematical riddles"** – Promotes logical thinking through problem-solving.

- **"Number puzzles"** – Focuses on identifying connections among numbers and arranging them correctly.

Such games make lessons interactive and interesting, improving knowledge retention. Game technologies play an essential role in explaining difficult topics, creating a competitive environment, and enhancing students' interest in learning.

### 2.3 Using Modern Technologies

Information and communication technologies play a crucial role in education. By using interactive learning platforms and mobile applications, students can independently solve logical problems. For example:

- **GeoGebra** – Assists in drawing and analyzing geometric figures.
- **Khan Academy** – Provides opportunities to independently learn mathematical topics and solve logical problems.

These technologies enable students to actively participate in lessons and encourage self-learning. Moreover, interactive tools help visualize complex concepts, making it easier to develop logical thinking skills.

### 2.4 Problem-Based Learning Method

Problem-based learning fosters students' ability to research and analyze independently. This method involves the following stages:

1. A problem is posed (e.g., a mathematical challenge).
2. Students independently or in groups analyze the problem.
3. Discussions and debates are conducted during the solution process.
4. Conclusions are drawn based on the results.

This method enhances students' creative thinking and teaches them to draw clear and logical conclusions.

## 3. RESULTS

The use of various methods to develop logical thinking through mathematics lessons in primary grades has proven effective. The study achieved the following key results:

- Logical problems and puzzles strengthen students' analytical thinking and teach them to understand cause-and-effect relationships.
- Game technologies create a competitive environment and increase students' interest in lessons, aiding in better knowledge acquisition.
- Information and communication technologies, particularly interactive platforms and mobile applications, develop students' independent learning skills.
- Problem-based learning helps students form independent opinions and actively participate in problem-solving.

Through these methods, mathematics lessons have become more interactive, engaging, and effective, significantly enhancing students' logical thinking skills.

#### **4. DISCUSSION**

Developing logical thinking skills not only improves students' mathematical knowledge but also equips them with essential life skills for solving everyday problems. The practical application of the methods analyzed in this article leads to the following conclusions:

- Lessons organized using interactive methods attract students' attention and strengthen their drive for independent thinking.
- Game elements actively involve students in the learning process and foster creative and logical approaches.
- The use of information technologies helps students master topics more deeply and creates a positive competitive environment.
- The problem-based learning approach develops students' critical thinking and nurtures creative reasoning skills.

#### **5. CONCLUSION**

Developing logical thinking in primary mathematics education is a critical aspect of the pedagogical process. By effectively applying the methods discussed above, it is possible to enhance not only students' mathematical knowledge but also their logical thinking abilities. In the future, these methods should be further improved and widely implemented in practice.

#### **REFERENCES:**

1. M. Barakayev, M. Tojiyev, D. Yunusova, K. Mamadaliyev – Technologies and Projects for Teaching Mathematics
2. B. S. Abdullayeva, A. V. Sadikova, N. A. Xamedova, N. M. Muxitdinova, M. I. Toshpulatova – Theory of the Primary Mathematics Course



3. V. V. Davydov – Theoretical Foundations of Mathematics Teaching
4. P. Ya. Galperin – Development of Mental Activity in the Teaching Process
5. J. Piaget – The Development of Logical Thinking in Children
6. R. Gagne – The Principles of Instruction
7. Sh. Amonov – Innovative Teaching Methods in Primary Classes
8. A. N. Leontyev – Psychological Development and Education
9. T. Tursunov – Modern Methods of Teaching Mathematics in Primary Grades
10. Y. X. Turdiyev – The Use of Interactive Methods in Mathematics Education
11. D.X. Raximova, Y.T. Jumayev – "Adapting Teachers to Digital Education and Automating Pedagogical Activities"
12. D.X. Raximova – "Technology for Organizing Project Activities in Primary Mathematics Lessons"