

The Role of Mathematics in the Development of Logical Thinking

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Abstract

mathematics is one of the main subjects of the programs. Mathematics, like no other subjects, contributes to the development of logical and spatial thinking in schoolchildren. It teaches schoolchildren to think clearly and accurately express their thoughts, sequences of actions, and achieve their goals. Mathematics forms in schoolchildren an idea of the spatial world, its laws and reflection in the minds of students..

Key words: *mathematics, logic, methodology, abstract thinking*

The main goal of teaching mathematics at school is to ensure that students consciously and firmly master the system of mathematical knowledge and skills necessary in work and everyday life in general. The practical significance of a school course in mathematics is due to the fact that its object is quantitative relations and spatial forms of the real world. Mathematical training is necessary to understand the principles, structure and use of modern technology. Mathematics is important for everyday practical activities of a person. In modern conditions, mathematics is the language of science and technology. With its help, many processes and phenomena occurring in the world, in society and nature are modeled, studied and predicted. Because of this, training students in mathematics is a necessary condition for accelerating scientific and technological progress. The scientific and economic potential of the country directly depends on its quality.

Mathematics is one of the core subjects in secondary school: it provides the study of other school disciplines. Mathematics requires students to have mental and volitional efforts, concentration, and the activity of a developed imagination. Mathematics also develops moral personality traits

(perseverance, creative activity, independence, determination, hard work). The most important task of the school mathematics course is the development of logical thinking. Mathematics, like no other subject studied in school, has the opportunity to teach students logic in practice at every step. In the process of mastering mathematical knowledge, the task of developing students' logical reasoning skills and the ability to find logical consequences from given initial conditions, the ability to abstract, i.e., characteristic of deductive thinking, is solved. highlight the essence of the issue in a specific situation, distracting from unimportant details. By studying mathematics, students master the skills to analyze the issue under consideration, generalize, identify necessary and sufficient conditions, define concepts, make judgments, and find ways to solve the problem.

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By studying mathematics, students master the skills to analyze the issue under consideration, generalize, identify necessary and sufficient conditions, define concepts, make judgments, and find ways to solve the problem.

All this shapes the thinking of students and contributes to the development of their speech, especially such qualities of expression as order, accuracy, clarity, brevity, and validity.

The main goals of teaching mathematics in a school course are:

1. Formation of thinking through learning activities; the ability to adapt within a certain system in relation to the norms accepted in it, consciously build one's activities to achieve a goal and evaluate one's own activities and its results.
2. Formation of a value system and its manifestation in personal qualities.
3. Formation of ideas about the mathematical method of studying the real world, the role and place of mathematics in the system of sciences.
4. Mastery of mathematical knowledge that ensures the inclusion of students in activities in mathematics lessons, related subjects and in practical life.

Studying the subject area "Mathematics" should provide:

- awareness of the importance of mathematics in human everyday life;
- formation of ideas about mathematics as part of universal human culture, the universal language of science, which allows one to describe and study real processes and phenomena.

When studying the subject "Mathematics", students develop logical and mathematical thinking, create an understanding of mathematical models; students master methods of mathematical reasoning; learn to apply mathematical knowledge when solving various problems and evaluate the results obtained; master the skills of solving educational problems. The results of studying the subject "Mathematics" (mathematics, algebra, geometry) should reflect:

- formation of ideas about mathematics as a method of understanding reality, allowing one to describe and study real processes and phenomena;
- development of skills to work with educational mathematical text (analyze, extract the necessary information), accurately and competently express one's thoughts using mathematical terminology and symbolism, carry out classifications, logical justifications, proofs of mathematical statements;
- development of ideas about number and number systems from natural to real numbers; mastering the skills of oral, written, instrumental calculations;

- mastering the symbolic language of algebra, techniques for performing identical transformations of expressions, solving equations, systems of equations, inequalities and systems of inequalities; the ability to model real situations in the language of algebra, examine constructed models using algebra, and interpret the results obtained;
- mastery of a system of functional concepts, development of the ability to use functional graphical representations to solve various mathematical problems, to describe and analyze real dependencies;
- mastery of geometric language; developing the ability to use it to describe objects in the surrounding world; development of spatial concepts, visual skills, skills of geometric constructions;
- formation of systematic knowledge about flat figures and their properties, ideas about the simplest spatial bodies; development of skills in modeling real situations in the language of geometry, studying the constructed model using geometric concepts and theorems, algebra, solving geometric and practical problems;
- mastering the simplest ways of presenting and analyzing statistical data; formation of ideas about statistical patterns in the real world and about various ways of studying them, about the simplest probabilistic models; development of skills to extract information presented in tables, charts, graphs, describe and analyze arrays of numerical data using suitable statistical characteristics, use an understanding of the probabilistic properties of surrounding phenomena when making decisions;
- development of skills to apply learned concepts, results, methods to solve problems of a practical nature and problems from related disciplines using, if necessary, reference materials, a computer, use assessment and estimation in practical calculations.

Thus, when designing the concept of a modern educational lesson in mathematics, the teacher must stimulate the student's learning motives, intensify learning activities, ensure reflection of learning activities and control over the process and results of the student's activities.

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