

The Role of Mathematics in the Development of a Child's Mind

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Annotation: Mathematics is one of the main subjects of the school curriculum. Mathematics, like no other subject, contributes to the development of logical and spatial thinking of schoolchildren. It teaches schoolchildren to think clearly and accurately express their thoughts, sequences of actions, and achieve their goals. Mathematics forms in schoolchildren an understanding of the spatial world, its laws, and its reflection in the consciousness 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 for work and everyday life in general. The practical significance of the school mathematics course is due to the fact that its object is quantitative relations and spatial forms of the real world. Mathematical training is necessary for understanding 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. Due to this, the preparation of 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 ensures the study of other school disciplines.

Mathematics requires mental and volitional efforts from students, concentration of attention, and the activity of a developed imagination. Mathematics also develops moral personality traits (perseverance, creativity, independence, determination, hard work).

A penchant for mathematics, like all other abilities, even in children with innate talent, develops only in the process of learning and practical classes. But when trying to make a mathematical genius out of a child, remember how difficult it is to do something we don't want to do. You don't need to force children to count if they want to play and run in circles — this way you will discourage them from studying for a long time. If we are talking about developing the mathematical abilities of middle-aged children, then it will be a little easier for you to agree and captivate the child with counting during the game. Of course, you need to start with the first acquaintance with mathematics:

- during the game, draw the child's attention to the different shapes of toys, their color and position in space (the teddy bear is closer than the pyramid, it is easier to reach, here is its top, and here is the bottom, etc.);
- then unobtrusive counting and sorting come into play — introduce the child to the concepts of "more" and "less", explain the difference between the piles of objects that you lay out in front of him, and suggest that they be equalized;
- then you can begin to teach the child to distinguish the simplest geometric figures and look for them around him, at the same time begin to study numbers, figures and easy actions with them.

Research by psychologists has established that thought processes are of crucial importance in learning. They are especially important in teaching mathematics, in particular, in solving mathematical

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problems. It is impossible to master the basic concepts of mathematics and learn to apply them in solving problems without understanding what is being studied. In the process of solving problems, it is necessary to consider the general and specific features of mathematical concepts and methods, to clarify the various manifestations of the concepts being studied. This means that the purpose of mathematical problems and exercises is not only and not so much training students as mastering the basic concepts, ideas and methods of mathematics.

The effectiveness of mathematical problems and exercises largely depends on the degree of creative activity of students in solving them. In fact, one of the main purposes of problems and exercises is to activate the thinking activity of students in the lesson. Mathematical problems should, first of all, awaken the students' thoughts, make them work, develop, and improve. When talking about activating students' thinking, we must not forget that in mathematics lessons, students not only learn to perform constructions, transformations, and memorize formulas and formulations, a mathematics lesson teaches correct thinking, the ability to reason, compare and contrast facts, find common and different things in them, and make correct conclusions. In mathematics lessons, students learn correct thinking, which means that, firstly, they are accustomed to full-fledged argumentation, i.e. to correct and legitimate generalizations, to the correct use of analogy. Secondly, it is necessary to teach schoolchildren to consider all possible varieties of a given situation.

Studying the subject area "Mathematics" should provide:

- awareness of the importance of mathematics in everyday life;
- formation of ideas about mathematics as part of universal culture, a universal language of science that allows describing and studying real processes and phenomena.

When studying the subject "Mathematics", students develop logical and mathematical thinking, create an idea of mathematical models; students master the 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 cognition of reality that allows describing and studying real processes and phenomena;
- development of skills in working with educational mathematical text (analysis, extraction of necessary information), accurate and competent expression of thoughts using mathematical terminology and symbols, classification, logical justification, proof of mathematical statements;
- development of ideas about number and numerical 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; skills in modeling real situations in the language of algebra, examining the constructed models using the apparatus of algebra, interpreting the obtained result;
- mastering the system of functional concepts, development of the ability to use functional and graphic representations to solve various mathematical problems, to describe and analyze real dependencies;
- mastering the geometric language; development of the ability to use it to describe objects of the surrounding world; development of spatial representations, 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, research of the constructed model using geometric concepts and theorems, the apparatus of algebra, solving geometric and practical problems;



- mastering the simplest methods of presenting and analyzing statistical data; forming ideas about statistical patterns in the real world and about various ways of studying them, about the simplest probabilistic models; developing the ability to extract information presented in tables, diagrams, graphs, describe and analyze arrays of numerical data using appropriate statistical characteristics, use an understanding of the probabilistic properties of surrounding phenomena when making decisions;
- developing the ability to apply the studied concepts, results, methods for solving practical problems and problems from related disciplines using reference materials, a computer, if necessary, using assessment and estimation in practical calculations.

The methodology for the formation of elementary mathematical concepts in the system of pedagogical sciences is intended to assist in preparing preschool children to perceive and master mathematics - one of the most important subjects in school, and also to contribute to the education of a comprehensively developed personality.

The methodology for developing elementary mathematical concepts in preschoolers is constantly evolving, improving and enriched by the results of scientific research and advanced pedagogical experience. At present, thanks to the efforts of scientists and practitioners, a scientifically based methodological system for developing elementary mathematical concepts in preschoolers has been created, is successfully functioning and is being improved. The kindergarten fulfills a special order from society, preparing children to study the basics of science (including mathematics) at school.

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

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