Teaching methodology of primary grade mathematics

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Abstract: General issues of mathematics teaching methodology in the primary class are discussed

Key words: Methodology, research, knowledge, method

General issues of mathematics teaching methodology in primary school

1. The subject, goals and objectives of the mathematics teaching methodology course.

2. Relationship of mathematics teaching methods with other fields of knowledge.

1. The word "Methodology" is translated from the ancient Greek language and means "the way of knowing", "the way of research". A method is a way to achieve a goal, to solve a certain educational task.

There are different views on the content of the concept of "methodology". Some recognized methodology as a pedagogical discipline and considered it a special didactics with teaching principles common to all disciplines. Others believed that methodology is a special pedagogical science that solves all the problems of learning and personal development through the content of the subject. Here are some examples of definitions.

Methodology of teaching mathematics - the science of pedagogy about the tasks, content and methods of teaching mathematics. He studies and studies the process of teaching mathematics in order to improve its effectiveness and quality.

Methodology of teaching mathematics is a branch of pedagogy that studies the patterns of teaching mathematics at a certain level of development in accordance with the goals of teaching the younger generation set by society.

Mathematics as a science differs from mathematics not only in the size, consistency and depth of the presentation, but also in the practical direction of the studied issues. Therefore, the methodology of teaching mathematics is experiencing great difficulties in its development due to the difficulties of bridging the gap between school mathematics and mathematics.

Thus, the methodology of teaching mathematics is considered as a subject of mathematics and the process of teaching mathematics to students of different age groups.

MPM answers three main questions:

1. Why the train? What is the goal of teaching early childhood mathematics?

2. What should be taught? What content should be taught? Are there criteria for selecting this content, the hierarchy (sequence) of its construction, and how are they based?

3. How to teach? What methods (teaching methods, methods, tools, forms) should be used to master the content chosen by the student?

The object of study of the methodology of teaching mathematics is the process of teaching mathematics, which consists of 4 main components: purpose, content, teacher's activity and student's activity. The components in the list are interdependent and interdependent, that is, they form a system in which a change in one of the components leads to a change in the others.

The subject of mathematics teaching methodology is the study of these components in a close relationship with each other.

Its main goal is to determine the laws of the process of teaching mathematical content, to summarize the most important evidence about it, and on this basis to make specific recommendations for teaching practice, to ensure its high efficiency.

The main tasks of mathematics teaching methodology:

1. Define specific goals for learning mathematics by grade and subject.

2. Planning the content of the subject in accordance with the goals and knowledge of students.

3. To determine the most reasonable methods and organizational forms of training aimed at achieving the set goals.

4. Consider the necessary teaching tools and develop recommendations for their use in the teacher's practice.

The content of MPM consists of issues of its general theoretical basis (general MPM) and issues of studying individual sections (specific or special MPM).

Learning mathematics in primary school aims to achieve the following goals:

- mathematical development of a young student - formation of intellectual activity (logical and symbolic thinking), spatial imagination, ability to speak mathematically; ability to think, select evidence, distinguish reasonable and unreasonable judgments, search for information (facts, reasons for ordering, options, etc.)

- mastering basic mathematical knowledge - understanding the values of quantities and their measurement methods; use of arithmetic methods in solving plot situations; formation of the ability to solve educational and practical problems with the help of mathematics; working with arithmetic operations algorithms;

- to develop interest in mathematics, the desire to use mathematical knowledge in everyday life.

Developing mathematical content in the first stage of school education c in the process of hiccup students are created conditions to achieve the following personal, meta-subject and subject outcomes.

The personal results of students are: readiness of the student to purposefully use knowledge to study the mathematical essence of the subject (phenomenon, event, fact) in teaching and in everyday life; the ability to describe their knowledge on the subject, formulate questions, determine which of the proposed mathematical problems can be successfully solved by them; interest in mathematics.

Results of metasubject students: analysis of educational situation from the point of view of mathematical properties, establishing quantitative and spatial relationships of objects of the surrounding world, creating an algorithm for finding the necessary information, determining the logic of solving practical and educational tasks; the ability to analyze the educational situation in terms of mathematical properties. - solving educational tasks with the help of signs (symbols), planning, controlling and correcting the progress of solving educational tasks.

Subject results of students: acquisition of knowledge about numbers and quantities, arithmetic operations, text problems, geometric shapes; selection and use of learned algorithms, properties of arithmetic operations, methods of finding quantities, methods of solving problems, use of symbolic tools, including models and diagrams, tables, diagrams. to solve mathematical problems.

The implementation of developmental education in the mathematics class requires the teacher to know the laws of psychology and child development. It is not only the organization of the child's attention, the use of memorization and multiplication patterns familiar to the teacher, etc. The fact is that the process of teaching mathematical knowledge to a young student should play the role of a stimulus and a mechanism for the child's personal development (development of the cognitive sphere, emotional-voluntary sphere, formation of the child's character and communication skills, etc.).

The analysis of situations related to the learning of specific mathematical concepts and the organization of children's activities in the mathematics lesson shows that the teacher's activity is integrative, because it is conditioned not only by methodological, but also by mathematical, psychological and didactic activities.

2. The methodology of teaching mathematics is closely related to other subjects and, first of all, to mathematics - its main discipline. The purpose of the methodology is to select the basic information of mathematics and to do didactic processing and adaptation of them and to include them in the content of school mathematics courses.

Mathematics teaching methodology is related to such subjects as philosophy, mathematics, psychology, pedagogy, logic, informatics, history of mathematics and mathematics education, human physiology.

Philosophy develops pedagogic, methodological research and methods of knowledge used in teaching mathematics: a systematic approach (components of the methodology of teaching mathematics and their relationships); methods of scientific knowledge (analogy, generalization, concretization, abstraction, etc.); philosophical laws; dialectical method of knowing.

Logic studies the laws of "correct" thinking. Concepts such as "expression", "proof", "equation", "conclusion rule" are logical concepts. Proofs of mathematical statements are based on logical actions. The formation of mathematical concepts is carried out on the basis of logical laws.

Mathematical methodology is closely related to pedagogy, in particular, didactics. In didactics, the main relations characterizing education are "teaching - learning", in methodology - "teaching - educational material - teaching". Pedagogy defines teaching methods, educational goals and scientific research methods. Based on these methods and goals from pedagogy, the methodology introduces its own mathematical content into the educational process and scientific research.

The methodology of teaching mathematics focuses on the characteristics of students of certain age groups, using patterns of individual characteristics of students of a certain age (memory, thinking, attention, etc.). The influence of psychology on the methodology of teaching mathematics increases due to the introduction of person-oriented education, which is characterized by increased attention to the student, his self-development, self-knowledge.

The methodology of teaching mathematics is related to the history of mathematics. The history of mathematics draws the teacher's attention to the difficulties that may be encountered in the study of the school mathematics course, and gives a personal significance to mathematical knowledge.

The methodology of teaching mathematics does not take into account the data of physiology, especially in research, for example, in the study of reflexes associated with signals from material objects and events, as well as words, signs, symbols.

Initial makt popular methods of teaching mathematics

The following methods are often used in mathematics lessons in the lower grades:

Explanatory and descriptive. In this case, the teacher gives a sample of knowledge, for example, shows how to solve an example or a problem, and asks children to reproduce it, that is, to solve the same example, the same problem by themselves.

Partial search system. This method involves the partial participation of children in solving the problem. The teacher divides the task into separate stages, some of which he performs himself, and some of which he entrusts to the students. For example, in a complex example, the teacher can show the children a new mathematical operation for them - multiplication or division, and give the class to independently complete the steps with well-known subtraction and addition.

Research. When using this method, the children themselves look for ways to solve new problems for them under the guidance of the teacher. For this, the teacher offers problem situations, logical and inventive tasks, etc. What should be considered when conducting mathematics lessons in elementary grades?

When explaining new material, the teacher should connect it with previously covered topics. To do this, the teacher engages students in collaborative work, encouraging them to increase existing knowledge based on past learning experiences. At the same time, illustrative tables, subject guides, didactic handouts, drawings, diagrams and other visual elements are widely used.

The methodology of teaching mathematics in elementary grades provides for the metered supply of new material. Divided into logically completed small parts. When choosing pedagogical methods, the individual capabilities of each child, the availability of educational material, and the availability of technical and visual educational tools are taken into account.

Where can I learn to teach elementary school math?

Naturally, if you have graduated from a pedagogical university, college or technical school and have a qualification as a primary school teacher, then you are also familiar with the methodology of teaching mathematics in grades 1-4.

Books:

- 1. Programs and textbooks of elementary school mathematics, methodological guides for teachers, didactic materials for students.
- 2. Actual problems of mathematics teaching methodology in primary grades / Ed. Navigation: site navigation, search
- 3. Bantova M. A., Beltyukova G. V. Methodology of teaching mathematics in elementary grades. Navigation: site navigation, search
- 4. Bespalko V. P. Pedagogy and advanced educational technologies. Moscow: Vocational Education Publishing House of the Russian Ministry of Education, 1995.
- 5. Istomina N. B. et al. methodology of teaching mathematics in elementary grades. Navigation: site navigation, search
- 6. "Primary school" magazines, etc.
- 7. Jikalkin because didactic games in mathematics lessons. Navigation: site navigation, search
- 8. Pyshkalo A. M. Methodology of teaching elements of geometry in elementary grades. Navigation: site navigation, search
- 9. Transition: movement on the site, searchM. expansion of didactic units as an educational technology. Part 1., Moscow. Education 1992.