STUDYING MATHEMATICS FOR JUNIOR SCHOOLCHILDREN IN THE SYSTEM OF DEVELOPMENTAL EDUCATION

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Abstract. *One of the typical devils of the modern stage of the development of the formation is that in practical person of the education, including initial, all активнее are introduced ideas developing education. The Particularities typical of zero level: stand out the casual signs analyzed situation, the past of the knowledge, not refusing decision of the problem, and etc.*
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One of the characteristic features of the modern stage of development of education is that the ideas of developmental education are increasingly being introduced into the practice of education, including primary education. Features characteristic of the zero level: random signs of analyzed situations are highlighted, past knowledge is reproduced that does not refute the solution to the problem, etc. Mental activity is characterized by its instability, the ease of transition from one action to another without sufficient grounds (sometimes accidentally found objectively correct actions change to erroneous ones, etc.).

As indicated in the law "On Education" and the "National Program of Personnel Training", every primary The teacher of the first class has an important task in front of him.

When we say the methodological and mathematical skills of the elementary school teacher, we mean his preparation based on the scientific worldview in the methodology of teaching mathematics in an integral connection with the general psychological-pedagogical and mathematical training. that's it.

Methodological-mathematical training is a component of primary school teacher training, and it cannot be considered in isolation from educational activities. On the other hand, teaching mathematics in elementary grades is the first stage, that is, it is the stage of preparing children to master the next school mathematics course, or their readiness for mathematics. These two aspects (aspects) of elementary education in mathematics (a component of elementary education and mathematical preparation) should be adequately reflected in the teaching methodology.

Elementary mathematics course, on the one hand, is used in other areas of knowledge and helps children's development. In this way, it creates a single complex of basic knowledge, and on the other hand, it is aimed at forming the necessary methodological ideas and logical structures of thinking.

Psychologists have proven that the period of 6-10 years is the most responsible period for the formation of important thinking skills and imagination of children. It is very difficult to fill the foundation of knowledge that was not formed in childhood. Therefore, one of the main tasks of the primary education methodology, especially mathematics, is to ensure a sufficiently high developmental efficiency of teaching, to accelerate the impact on children's mental development.It is advisable to enrich the lesson with creative thinking materials rather than being limited to the

materials in the textbook. For example, using different representations of multiplication by 10, 100, 1000 will increase students' interest.

68•5 = (34•2) • 5 =34• (2•5) = 34•10 =340

68•50= 34•100=3400

According to the distributive law of addition:

17•50= (16+1) •50= 16•50+1•50=800+50 = 850

According to the technique of dividing numbers:

135:5= (135•2) : (2•5) =270:10=27

2250:50=4500:100=45

It is necessary to attract the attention of students to increase oral and written so that the interest of students increases.

24•25 = (6•4) • 25= 6• (4•25) = 6•100=600

In this case, it is necessary to try to choose the shortest possible case:

24•25=(24:4) •(25•4) = 6•100=600

The use of parentheses in multiplication is very interesting:

37•25=(36+1)•25=36•25+1•25=900+25=925

35•25=(36-1)•25=36•25-1•25=900-25=875

38•25=(36+2)•25=36•25-2•25=900+50=950

The verbal method of multiplying by 25 is to multiply by 24 and 26

It is desirable to replace (25-1) and (25+1) with the expression.

(This is necessary when passing the concept of quarters, pieces, shares.)

For example: 36•26=36(25+1)=36•25+25+36•1=900+36=936

36•24=36(25-1)=36•25-36•1=900-36=864

Dividing by 25 is done according to the rule of dividing by 5. We strengthen the above calculations by doing the reverse calculations.

For cases where the divisor is doubled by 2 or 4, it is based on the rules of filling the numbers with zeros:

225:25=(225•2): (25•2) or (225•4): (25•4)=900 : 100=9

If it is necessary to multiply by 9.99 and 999, then according to the rule of calculation in the most convenient way, according to the distribution law in the form (10-1), (100-1), (1000-1) :

678•9=678(10-1)=6780-678=6102

577•99=577(100-1)=57700-577=57123

34•999=34(1000-1)=34000-34=33966

The rule of multiplication in 3rd grade (14•15).

14•15=14(10+5)=140•14•5=140+70=210

It is necessary to do this without rushing to calculate immediately, because 14•15=14•10+14•5=(14+7)•10=21•10=210

do not forget to perform the calculation in the form.

If it is 23•15

23•15=(22+1)•15=22•15+1•15=330+15=345

Also, multiplying by 14 and 16 can be replaced by (15+1) and (15-1).

66•14=66•(15-1)=66•15 - 66 = 990 - 66 = 924

62•16=62(15+1)=62•15+15•1=930+62=992

61•69=6(6+1)•100+1•9=4200+9=4209

243•247=24•25•100+3•7=60000+21=60021

Completing calculations in such ways strengthens students' oral calculation technology.

In accordance with this one of the principles of developmental education, the special organization of anemic activities that ensures awareness and strength of acquired knowledge deserves attention. The formation of solid knowledge, ready for use in various situations, when solving new problems, is facilitated by both a direct focus on memorizing knowledge and special training that forms the basis of the academic subject, as well as special training in rational methods of anemic activity. These are the basic principles of learning aimed at developing productive thinking. There are some age-related features in the development of productive thinking in schoolchildren. Therefore, the development of productive thinking can be divided into main levels and stages. The zero level is characterized by unproductivity. Faced with the need to independently acquire knowledge and solve a new problem for themselves, students at this level mechanically reproduce individual specific situations on the basis of which the problem should be solved, or form well-known provisions associated with these situations. They even show some mental activity, making individual attempts to solve problems. However, these are random, mechanical tests-manipulations, which differ not so much in their initial link - action; such techniques, firstly, because they contribute to the improvement of reproductive thinking as an important component of creative activity. Secondly, these techniques are the fund of knowledge from which the solver can draw “building material” to create ways to solve problems that are new to him.

The insufficiency of such techniques lies in the fact that, not corresponding to the specifics of productive thinking, they do not stimulate the intensive development of this particular aspect of mental activity. These techniques correspond to the very nature and specificity of creative thinking. In psychological works directly related to the problems of productive creative thinking, a lot of attention is paid to describing the negative role of past experience, which can hinder and slow down movement in a fundamentally new direction, and the need to overcome the “barrier of past experience” is emphasized.

In previous teaching practices, consolidation of knowledge was mainly associated with training, with the number of repetitions, on which the strength of knowledge was believed to primarily depend. Modern research has shown that there is no direct connection between the number of repetitions and the strength of knowledge, that consolidation of knowledge is a very complex anemic activity in which memory and thinking are inextricably linked. Its result depends mainly on the degree of activity of consciousness during assimilation, on the nature of the mental activity carried out and the material to be assimilated.

To realize the possibilities of productive thinking, it is necessary not only to have knowledge in RAM, which provides the solution to these specific problems, but also to transfer it into permanent memory for long-term storage, for further use in appropriate situations. conceptual), and the predominance of one of them is determined by the personal characteristics of the students’ psyche. In accordance with this, the principle of harmonious (optimal for the individual, stimulating his abilities) development of various components of thinking should be implemented in training. Under the influence of modern psychological research, in the last decade, the principle of special formation of mental activity techniques was formulated as one of the ways to increase the developmental effect of training. First of all, attention was paid to teaching

schoolchildren the correct methods of logical thinking (in accordance with the laws of formal logic), and later to equipping them with algorithms for solving various types of problems.

The specificity of creative tasks involves the use of auxiliary methods of analysis - “heuristics”. Such techniques include the technique of concretization, when the decider gives abstract data a more concrete form. The most common technique is variation, which makes it easier to identify functional relationships between data. This technique consists in the fact that the decider arbitrarily discards or changes the value of one of the data (and sometimes several) and, based on logical reasoning, finds out what consequences follow from such a transformation, how the change in one of the data affected the rest. The opposite of the graphical analysis technique is the abstraction technique, when the solver discards specific details, “exposing” the data and the relationship between them. The techniques of analogy and posing similar questions are widely used in solving problems.

The formation of methods of mental activity of an algorithmic type, focused on a formal logical analysis of problems, naturally leading to the choice of an appropriate specific method of solution, is a necessary but insufficient condition for the development of thinking. Intelligence is necessary; characteristics of each stage are given depending on the leading type of mental activity.

At the first stage, the leader is visual-effective, practical thinking, which is carried out in a specific situation in the process of practical actions with real objects. For young children this is “thinking with their hands.” The child learns the features of objects as he takes them apart with his hands and connects them with each other, i.e. works with objects. At the second stage, visual-figurative thinking predominates; it allows you to solve problems based on operating not with real objects, but with images of perception and ideas contained in childhood experience. Although the connection between thinking and practical actions remains, it is not as direct and immediate as before. To solve problems, the child must clearly perceive and visually imagine the situation depicted in them. At the third, highest stage of development, abstract, abstract theoretical thinking takes on a leading role in mental activity. Thinking appears here in the form of abstract concepts and reasoning, reflecting the essential aspects of cognizable reality and the natural connections between them. Mastering concepts, laws, and theories in the course of mastering the fundamentals of science has a significant impact on the mental development of schoolchildren. It reveals rich opportunities for independent creative acquisition of knowledge and their widespread application in practice. The harmonious development of personality involves the activation of all types of thinking and their improvement.

The need to develop various types of mental activity also follows from the specifics of productive, creative thinking. In productive mental activity, its various components (both practical and educational, and the knowledge and opportunities for acquiring new knowledge necessary to solve them) act in close interaction. The main principle of recruiting students at school is to take into account their age characteristics. However, numerous psychological studies have shown that differences in mental development between students of the same age are often much greater than between students of similar ages (with an interval of 1-3 years).These differences clearly appear when comparing students of the same age for each component included in the structure of mental development - in terms of the level of mastery of knowledge, mastery of generalized techniques and methods of operating them and, finally, in terms of the level of learning ability as the general ability to acquire new knowledge. Therefore, a very important principle of developmental education is the principle of its individualization and differentiation. The implementation of the

principle of problem-based individualized learning has an impact a positive impact on the advancement in the development of all main groups of schoolchildren: with high, average and low levels.

Primary educational tasks in mathematics can be solved only on the basis of the theoretical knowledge system. This knowledge includes scientific worldview, psychology, didactics, mathematics and methodological teaching theory (mathematical didactics) that includes their characteristics. However, theoretical knowledge alone is not enough to prepare for any other activity. Knowing how to use the most effective methods for one or another educational option, which is affected by the specific content of teaching and the level of mental activity of students, is a specific methodology that occurs during preparation for the lesson or during the lesson itself. it is necessary to know how to solve tasks.

It is especially important for the teacher of primary classes to know and take into account the level and capabilities of mental activities of students, since the mental development of children is founded in these primary classes. The future practical activity will be acquired through tasks performed in the methodology of teaching mathematics in seminars, practical and laboratory classes.

There are various methodological issues that arise in the preparation for practical training and in the training practice and require the use of theoretical knowledge.

Methodological issues arise in every lesson, however, as a rule, they do not have a one-size-fits-all solution. In order for the teacher to be able to quickly find the most suitable solution for the methodological problem that arose in the lesson, it is necessary to have extensive training in this field. For this reason, the methodological issues presented in this manual, including those that arise directly in the lesson, should be solved in as many different ways as possible. Special attention should be paid to the methodological issues arising in connection with students' wrong answers. Determining and explaining the essence of mistakes performs an important educational task.

Games are important for preschool children: learning through games is a serious form of education. The existing didactic games are used as a means of strengthening the learned material from the point of view of logic and mathematics.

Problems arise in the content and methods of teaching children from the age of 6-7. Teaching counting, addition and subtraction at the first stage (within a hundred) has been and remains the main task of primary education. However, this will not be the only task, but it will be a component of the work of preparing children for the study of mathematics in a wider and more comprehensive way. It is defined in two main ways: the pedagogical way, that is, preparing children's thinking for applied mathematical reasoning, and the mathematical way, that is, teaching children the most important mathematical concepts, first of all, natural numbers and geometric shapes. by preparing to learn their concepts.More developed students have the opportunity to work on material of increased difficulty and independently solve problems that are adequate to their capabilities. Less developed ones receive more detailed explanations from the teacher, solve problems of gradually increasing difficulty with some outside help, learn new material, advance in their development, often moving to groups with a higher level. Problem-based learning and other principles of developmental education cannot be implemented without taking into account the age and individual characteristics of children’s thinking. A lot of research has been devoted to age-related characteristics of intellectual development. They reveal the stages of development.

Such training has a significant impact on the mental development of schoolchildren, since it corresponds to the very nature of thinking as a process aimed at discovering new patterns for humans, ways to solve cognitive and practical problems. Only those problems are problematic, the solution of which involves, although guided by the teacher, an independent search for patterns, methods of action, and rules still unknown to the student. Such tasks stimulate active mental activity, supported by interest, and the "discovery" made by students brings them emotional satisfaction and is much more firmly fixed in memory than knowledge presented in a "ready-made" form. In the process of solving a problem, students overcome difficulties, resolve contradictions between existing knowledge and the requirements of the task, identify new elements of knowledge, new ways of operating with them, master methods of cognition, which expands their capabilities in solving new, even more complex problems. This active independent mental activity leads to the formation of new connections, new personality traits, positive qualities of the mind and thereby to a shift in mental development. The choice of tasks for problem-based learning primarily depends on the specifics of their content, the students' initial minimum knowledge, and the level of independence in posing and solving problems.

Numbers and calculations

- to have an idea about the natural numbers within 1000, to understand the specific features of the structure of the natural series of numbers;
- mastering the decimal notation of numbers;
- to have an idea about Roman numerals and their use;
- mastering the methods of adding and subtracting numbers within 1000 (written and spoken);
- mastering the methods of showing and dividing numbers within 100 outside the table;
- mastering the methods of showing and dividing numbers ending in zeros into one-digit numbers, whole tens and whole hundreds;
- to teach how to divide a number with a remainder;
- mastering the written methods of showing and dividing a three-digit number into a one-digit number;
- to have an idea about the order of actions in bracketed and unbracketed expressions containing 2x3 actions;
- correct equations of the form x + 123 = 140, x – 436 = 152,. x x 4 = 160, 810 : x = 135 (based on the selection method and the relationship between the given and the sought number) and learning to solve quickly;
- gaining experience in solving various textual problems with 1x2 actions;
- to have an idea about the units of mass measurement: ton, centner, kilogram, gram, and their compatibility.
- to have ideas about units of measurement of time: hour, minute, day, year, month, week, second, century and their compatibility.The most effective way to create problem situations for students is to use contradictions, conflicts between existing knowledge, familiar ways of solving a certain class of problems, and the requirements that a new task makes. The developmental effect is provided only by such tasks-problems that correspond to the level of mental development of students, which the productivity of mental activity increases with age, which is associated with the beginning of the formation in schoolchildren of such positive qualities of their mental activity as

its independence, depth (expressed in the ease of abstraction and high level of generalization of signs essential for solving the problem), awareness, stability; Flexibility of thinking also increases.

In accordance with the requirements of a modern school, education in it is focused on the development of productive, creative thinking, providing the opportunity to independently acquire new knowledge and apply it in diverse conditions of the surrounding reality. As a result of productive thinking, new formations arise, new systems of connections are formed, new properties, qualities of the mind (flexibility, depth, awareness, etc.), which mark a shift in mental development. That is why the impact of training is directed towards this side of the psyche. To increase its developmental effect, it is necessary to take into account the specifics of productive thinking, the relationship between age and individual mental characteristics of schoolchildren.

We can identify a number of psychological and pedagogical principles that are important components of the system of developmental education, education that has a significant impact on the intellectual development of students. The principle of problematicity, responding to the specifics of productive thinking - its focus on the discovery of new knowledge, is the main, leading principle of developmental education.

Problem-based learning is such learning in which the assimilation of knowledge and the initial stage of the formation of intellectual skills occur in the process of relatively independent solution of a system of tasks and problems, occurring under the general guidance of a teacher. A person’s mental abilities are judged not because of what he can do on the basis of imitation, or learn as a result of such a detailed explanation.

A person’s intelligence is manifested in the relatively independent acquisition, “discovery” of new knowledge, and in the breadth of transfer of this knowledge to new situations when solving non-standard problems. In this side of the psyche, productive thinking finds its expression; its features are manifested in the qualities of the mind that are formed in a person, determining the level and specificity of a person’s learning ability.

Productive thinking involves not only the widespread use of acquired knowledge, but also overcoming the barrier of past experience, moving away from the usual train of thought, resolving contradictions between updated knowledge and the requirements of the problem situation, the originality of solutions, their originality.

For productive problem solving, it is important not only to highlight the essential features required by the situation, but also to hold the situation under analysis in accordance with them, without succumbing to the provoking influence of external, random features.

The stability of the manifestation of certain features of productive thinking by younger schoolchildren (its depth, flexibility, etc.), subject to knowledge in various subjects, indicates that these features have become personality traits, qualities of the mind of these schoolchildren. At this level, they determine the specifics of schoolchildren’s general learning abilities, i.e. general learning ability.

The characteristics of productive thinking of schoolchildren are formed and developed in activities, primarily educational ones. By improving the content and methods of teaching, it is possible to significantly increase their influence on the development of productive thinking in schoolchildren, on their ability to independently master new knowledge.

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