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METHODS OF TEACHING ALGEBRAIC MATERIAL IN ELEMENTARY GRADES

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Annotation:
The article revials with the issues of methodology for teaching algebraic material in elementary grades.

Keywords: equality, inequality, expression, variable, equation.

Introduction

“Mathematics is in our blood. But over the past 20 years, the level of knowledge in this science has declined. Because we did not pay due attention to teachers, did not give them a decent salary, did not set a specific goal for them. The consequences of this are now being felt in many areas,” the president said. “Today, our goal in developing this area is to create a competitive environment in mathematics.”
President of the Republic of Uzbekistan Shavkat Miromonovich Mirziyoyev
Algebraic material is one of the components of the elementary course of mathematics, but is not singled out as an independent section. First introduced into science in 1969-1970. and the school subject began to be called "Mathematics". The study of the elements of algebra in the elementary course of mathematics is closely related to the study of arithmetic, because. the algebraic part of the program is of particular importance in the mathematical development of the younger student, as well as for the further concept of the mathematics course in the senior classes.
Literature analysis. When writing this article, we analyzed and used the research works of famous mathematicians-methodists of the world: M.I. Moreau, G.V. Beltyukova, A.M. Pyshkalo, M.A. Bantov and Uzbekistan: M.E. Zhumaeva, Z.G. Tajiev and others, made up to the present day on the methodology of teaching mathematics in primary school. We reviewed and studied scientific works such as "Methods of Teaching Mathematics in Primary Grades", "Mathematics in Grades 1-4", "History of Mathematics at School" and expressed our opinions based on this.

Research Methods

In elementary grades, students are introduced to basic algebraic concepts such as: "equality", "inequality", "expression", "variable", "equation". Familiarization of

students with these algebraic concepts creates conditions for the generalization of many arithmetic concepts.

Along with the basic concepts, the following main tasks can be distinguished when studying the initial course of mathematics:

1. To form students' ability to read, write and compare numerical expressions;
2. Introduce students to the rules for performing the order of actions and develop the ability to calculate values;
3. To form in students the ability to read, write down literal expressions;
4. Introduce students to the simplest equations;
5. Teach how to solve simple problems using equations.

The concepts of equalities, inequalities and equations are revealed in interconnection. Work on them has been carried out since grade I, organically combined with the study of arithmetic material.

Numerical equalities and inequalities are obtained by students as a result of comparing given numbers or arithmetic expressions. Therefore, the signs ">", "<", "=" connect not any two numbers, not any two expressions, but only those between which the indicated relations exist. Two equal numbers or two expressions that have equal values, connected by the sign "=", form equality. If one number is greater (less) than another or one expression has a value greater (less) than another expression, then, connected by the corresponding sign, they form an inequality.

There are three stages in the methodology for working on numerical expressions: the first is to form concepts about the simplest expressions (+, -, *, /); the second is about expressions containing two or more arithmetic operations of the same stage; the third is about expressions containing two or more arithmetic operations of different levels. With the simplest expressions - "sum and difference" - students get acquainted in the first grade, with "product and quotient" - in the second grade.

Performing operations on sets, children, first of all, learn the specific meaning of addition and subtraction, therefore, in records of the form 3 + 2, 7-1, the signs of actions are perceived by them as a short designation of the words “add”, “subtract” (add 2 to 3).

In the future, the concepts of actions deepen: students learn that by adding (subtracting) a few units, we increase (decrease) the number by the same number of units (reading: 3 increase by 2), then the children will learn the name of the plus signs (reading: 3 plus 2), "minus".

The ability to read and write expressions, find their values using the appropriate arithmetic operation is developed through repeated exercises.

The ability to compose and find the meaning of an expression is used by children in solving arithmetic problems, at the same time, here the concept of “expression” is further mastered, the specific meaning of expressions in the records of solving problems is assimilated.

The rules for the order of actions in complex expressions are studied in the 3rd grade, but children practically use some of them in the first and second grades.

The first is the rule on the order of performing actions in expressions without brackets, when numbers are either only addition and subtraction, or multiplication and division (3 cells).

On the basis of calculations and analysis of specially selected expressions, students of grade IV are led to the conclusion that if brackets in expressions with brackets do not affect the order of actions, then they can be omitted. In the future, using the studied properties of actions and the rules for the order of actions, students practice converting expressions with brackets into expressions that are identical to them without brackets. For example, it is proposed to write these expressions without brackets so that their values do not change:

(45 + 30)-20 (10 + 4) •2

So, the children replace the first of the given expressions with the expressions: 45 + 30-20, 45-20 + 30, explaining the order of performing actions in them. Thus, students are convinced that the meaning of the expression does not change when the order of actions is changed only if the properties of the actions are applied in this case.

The study of literal expressions.

For the first time, students are introduced to the variable in grade 3. when studying the topic "Expression and its meaning". In the process of learning, children should learn to read and write expressions with one and two variables of the form: a + 2, a + b, c-13, c-d, 3 • c, 16: c, and so on, learn to find the values of these expressions for given letter values.

In grade 3 children are introduced to expressions containing a variable and then two variables. The term "variable" is not introduced.

Letter symbols will be a means of generalization only when students have observed certain connections, dependencies, relationships, properties, etc. many times in numerical examples, formulated the corresponding conclusions, rules or properties and used them in performing various exercises.

Thus, the use of alphabetic symbols contributes to an increase in the level of generalization of knowledge acquired by primary school students, and prepares them to study a systematic course of algebra in the following classes.

The concept of an equation occupies a special place among the algebraic concepts studied in elementary grades. It is closely related to the concept of expression, variable, equality.

Equality with an unknown number is called an equation.

For example: 34 + x = 45.

To solve an equation means to find such a value of an unknown number for which the equality will be true. This number is called the root of the equation.

The equations are directly solved:

1. The way of selection.
2. The way of using the interconnection of action components.

Selection method. From the given values or from an arbitrary set of numbers, a suitable value of an unknown number is selected. In this case, the selected number should, when substituted into the expression, turn it into a true equality. For example: from the numbers 3, 5, 6, 7, 10, choose a value x., in which the equality x + 3 = 10 would be correct.

When solving by the selection method, students form a conscious idea of what it means to solve an equation (to find a number that, when substituting into this equation, gives the correct equality).

A way to use the relationship of action components. The rules of interconnection of action components are used when solving the equation:

1) 5+ X. = 12

We have the second term unknown. We recall the rule that in order to find an unknown term, it is necessary to subtract the known term from the sum (the value of the sum).

So X = 12 - 5

X = 7.

Conclusion

Thus, the introduction of algebraic material into the elementary course of mathematics makes it possible to prepare students for the study of the basic concepts of modern mathematics (variable, equation, equality, inequality, etc.) contribute to the generalization of arithmetic knowledge, the formation of functional thinking among students. The study of algebraic material is carried out in close connection with arithmetic material. The introduction of elements of algebra is of great importance for improving the system of mathematical education at the 1st stage of general secondary education, expanding the concepts of mathematical means used by younger students in solving problems.

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