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9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Methodology of Working on Numerical and Variable Expressions

Daughter of Raykhana Mukhammadjon Tadjibaeva

Teacher of the Department of Primary Education, Kokand State Pedagogical Institute, Uzbekistan

Algebra material is not separated as an independent section in the program of elementary grades. In the elementary mathematics course, the study of elements of algebra is inextricably linked with the issues of arithmetic. according to the current program, students should get basic information about mathematical expressions, numerical equalities and equations, get acquainted with letter symbols, variables, learn to solve the simplest equations and inequalities. First of all, let's see the meaning of the concept of numerical expression. The concept of numerical expression is a concept studied in elementary grades. The concept of expression, which is included in the elements of algebra, can be described as follows.

A) every number is a numerical expression.

B) If A and V are numerical expressions, then $A + V$, $A - V$, $A \cdot V$, $A : V$ are also numerical expressions.

We find the value of the numerical expression by performing the specified operations and performing the operations placed between the numbers.

For example: $30 : 5 = 6$, $6 ; 3 = 2$; $(7 - 1) = 6$ are numerical expressions.

The action symbol placed between the numbers in the mathematical expression has two different meanings. On the one hand, it indicates the action to be performed on the numbers, and on the other hand, the action sign serves to define the expression.

For example: $7 + 5$, you need to add 5 to 7. $7 + 5$ is the sum of 7 and 5.

As required by the program, elementary school students should learn to read and write expressions. They should master the rules of performing operations in expressions containing two or more operations, replace expressions using the properties of arithmetic operations, and familiarize themselves with them. The simplest numerical expressions are students with addition and subtraction

In class I and class II, they get to know two more simple expressions: multiplication and division.

Learning the number 3? children understand adding and subtracting (+, -) words.

For example: The teacher invites the children to grab 2 sticks and then one more stick and say how many sticks there are, and concludes by saying "two and one together make 3".

For example, when learning the topic of addition and subtraction of 3, children use the sum term. $3 + 4 = 7$ indicates the name of the value of the expression in the form. 3rd participant; 4th participant; 7th total. The number 7 indicates the result of addition. In this example, it says that not only the number 7 is a sum, but also $4 + 3$ is a sum. $3 + 4 = 7$ in order to learn the double meaning of the sum term, for example: find the sum of the numbers 7 and 2. Replacing the number 6 with the sum of 2 numbers, find the sum of the first addendum 4 and the sum of the second addendum 5. When introducing the concept of difference, two meanings of this term are revealed, that is, on the one hand, it means the value of the expression, and on the other hand, it means the expression itself. For example: 9 decrement-6 divisor q 3 difference

Work on multiplication and division will be the same. 4 multiplier \cdot 3 multiplier q 12 multiplier; $20 : 4 = 5$ divisions. Then students get acquainted with complex expressions.

For example: $3 + 1 + 1$, $5 - 1 - 1$, $7 - 3 + 2$, $10 - (2 + 3)$, $(6 - 3) + 2$ in class I

Expressions in this form prepare students to master the properties of arithmetic operations and the rules derived from them. Children are taught to read the given expressions and find their value. From preparatory exercises for writing expressions and learning to read them.

For example: the number 10 suggests making an expression using the plus sign and the addition of $4 + 3$, in which children make the expression $10 + 4 + 3$ or $4 + 3 + 10$. The teacher offers to read the example and shows that it is not made of three separate numbers, but of the number 10 and the sum of the numbers 4 and 3. $10 + (4 + 3)$. Then the children are taught to form the expressions $10 - (5 + 2)$, $5 + (7 - 3)$, $(6 - 3) + 5$, $6 - (5 - 3)$ as above and are taught by the

children . For example: $10-(5 + 2)$ Subtract the sum of 5 and 2 from 10. $5 + (7-3)$, add the difference of 7 and 3 to 5 $(6-3) + 5$, add 5 to the difference of 6 and 3. Class II consists of two simple expressions.

Expressions for example: $(7 + 3)-(4 + 2)$; $(6 + 2) + (1 + 2)$ and then expressions involving multiplication and division of 2 numbers are taught. $3 \cdot 4-6$; $16: 4 + 5$, then the terms of the value of the expression are introduced, tasks such as write expressions and compare their values, compare expressions are given, and the rules of the order of operations are taught, which are carried out in this order:

A) In expressions without parentheses, the order of execution of operations is changed, in this case, only the operations of the first stage, addition and subtraction, or only the operations of the second stage, multiplication and division, are performed on the numbers. In this case, students will get acquainted with this rule: if there are addition or subtraction operations in expressions without parentheses or only multiplication or division operations, then in which order these operations are performed from left to right.

B. The rules of the order of performing the actions are included in the expressions without brackets containing the I and II stage actions: $3 \cdot 4 + 13$, $50-25$. If steps I and II are involved in the expression, steps II and then step I are performed first.

V. the rules of the order of execution of actions in parentheses are analyzed. In this case, the value of the expression inside the parentheses is found first, and then the operation on the parentheses is performed. Then a new form of reading expressions will be introduced.

For example: $50 + 6 \cdot$ the last operation in the expression is addition. Therefore, the whole expression represents the sum. It reads "the first addendum is 50, the second addendum is the product of 6 and 3." $50-30 : 5$ is read as "reduced by 50, divided by 30 and 5."

Expression replacement.

In elementary classes, the substitution of expressions is done based on:

A) Tariffs of operations: for example: the sum of the same addends is replaced by a product. $3 + 3 + 3 + 3 = 3 \cdot 4$ and vice versa $6 \cdot 4 = 6 + 6 + 6 + 6$.

B) Properties of arithmetic operations and rules derived from them.

For example: $36 + 40 = (30 + 6) + 40 = (30 + 40) + 6 = 76$;

$39 : 3 = (30 + 9) : 3 = 30 : 3 + 9 : 3 = 10 + 3 = 13$

So, to replace expressions is to replace a given expression with an expression whose other value is equal to the value of the given expression. The concept of variable is one of the most important concepts of modern mathematics. A variable is a symbol that can be replaced by different values. The general concept of variable expression is defined as the concept of numeric expression, variable expression includes letters in addition to numbers.



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