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METHODS OF SOLVING MATHEMATICAL PROBLEMS FOR PRIMARY SCHOOL STUDENTS AND THEIR EASY DELIVERY

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Abstract

This article discusses methods of teaching primary school students to solve mathematical problems and their easy delivery. The article analyzes various methods of solving problems, such as arithmetic, algebraic, selection, graphic and practical methods. At the same time, information is provided about the systematic work carried out to develop mathematics education in Uzbekistan, in particular, measures taken on the basis of presidential decrees. Methods of constructing equations and finding solutions through arithmetic operations in solving problems are shown with examples. Recommendations are given for making the learning process interesting and appropriate methodological approaches for easy delivery of problems to primary school students.

Keywords

Primary school, mathematical problems, arithmetic method, Algebraic method, Equation formulation, Distance learning, Teaching methodology, Mathematics education, Uzbekistan education system and Didactic approach

Today, one of the important issues is the new organization of the educational process, its didactically enriching and harmonizing the content of education with the national and peoples' culture. The Resolution of the President of the Republic of Uzbekistan No. PQ-4708 dated May 7, 2020 "On measures to improve the quality of education and develop scientific research in the field of mathematics" was an important step in this regard. Based on this resolution, the development of mathematics was identified as one of the priority areas of science development in 2020. In recent years, systematic work has been carried out to bring mathematics education to a new qualitative level, which has brought significant changes in the easy and understandable presentation of mathematical problems to primary school students.

Teaching primary school students to solve mathematical problems is important for developing their logical thinking skills, developing problem-analysis skills, and preparing for complex problems in the future. This article analyzes convenient methods for solving mathematical problems for primary school students and methods for easily presenting them.

Basic methods for solving mathematical problems

Several basic methods are used to solve mathematical problems in primary school: arithmetic, algebraic, selection, graphical solution, and practical methods. Each of these methods has its own advantages and requires different approaches to solving problems.

The arithmetic method is based on finding an unknown value by constructing numerical expressions (numerical formulas) and calculating the result. This method is one of the most convenient for primary school students, as it requires simple arithmetic operations (addition, subtraction, multiplication, division). Uzbek researcher Bikbaeva N.U. emphasizes the importance of the arithmetic method in her work, writing that "Solving problems using the arithmetic method develops logical thinking in students and prepares them to construct equations" (Bikbaeva, 1996).

For example, let's consider solving the following simple problem using the arithmetic method:

Problem: There were 12 apples in a basket. 5 of them were taken. How many apples were left in the basket?

Solution:

12(total number of apples)-5(taken)=7

Answer: There are 7 apples left in the basket.

This example is simple and understandable for primary school students, helping them master basic arithmetic operations.

Algebraic method

The algebraic method is based on the use of equations and systems of equations in solving text problems. This method may be a bit complicated for primary school students, but it is important to teach them to construct equations in grades 4-5. The famous American mathematician D. Poya writes about the algebraic method in his book "How to Solve a Problem": "Constructing an equation means expressing a condition formulated in words with mathematical symbols. This is a translation from simple language into the language of mathematical formulas" (Poya, 1959).

Uzbek scientists Mirzaahmedov M.A., Rakhimqoriyev A.A. and Tokhtakhojayeva M.A. Let's consider the following problem presented in the 5th grade mathematics textbook by:

Problem: The elder brother is now 26 years old, and the younger brother is 6 years old. In how many years will the elder brother be three times as old as the younger brother?

Solution:

Let's denote the unknown year as (x) and write the equation:

$26+x=3\cdot(6+x)26 + x = 3\ (6 + x)26 + x = 3(6 + x)$

Let's solve the equation step by step:

$26+x=18+3x26 + x = 18 + 3x26 + x = 18 + 3x$

$26-18=3x-x26 - 18 = 3x - x26 - 18 = 3x - x$

$8=2x8 = 2x8 = 2x$

x=4x = 4x = 4

So, in 4 years, the elder brother will be 30 years old, and the younger brother will be 10 years old. In this case, the elder brother will be 3 times older than the younger brother (30 = 3 × 10).
Answer: In 4 years.

This example shows how the algebraic method can be used in primary grades. Uzbek researcher Raupova L.R. writes about this method: “The algebraic method serves to develop logical and systematic thinking in primary school students” (Raupova, 2021).
The selection method is based on choosing an answer from several options that meets the conditions given in the problem. This method is easy for primary school students and develops their ability to analyze problems. For example:
Problem: There were 10 apples in a basket. How many apples should be taken so that 6 apples remain in the basket?
Solution: There are 10 apples in the basket, 6 should remain. Therefore, 10 - 6 = 4 apples should be taken.
Answer: 4 apples.

Graphic solution method
The graphic method is based on solving the problem visually. This method is interesting for primary school students and develops their spatial imagination. Uzbek scientist Bikbaeva N.U. writes about the graphic method: “Solving problems through the graphic method develops visual thinking in students and helps them understand mathematical concepts more easily” (Bikbaeva, 1996). For example, students can be offered to solve the problem “There are 3 people in a family, each person eats 2 apples a day. How many apples do you need for 3 days?” in a graphic form. By showing the number of apples for each person for 3 days in the form of a diagram, it is easier to calculate the total amount.
Practical method

The practical method is based on solving the problem through real-life situations. For example, students are given a shopping task in a store: “You have 10 soums, a candy costs 2 soums. How many candies can you buy?” This method helps students connect mathematics with life.

Methods for easily presenting problems to primary school students

It is important to use several methodological approaches to easily present mathematical problems to primary school students. Uzbek researchers recommend the following methods in this regard:

Using simple and understandable language

Problems for primary school students should be written in simple and understandable language. Complex words or phrases should be avoided. Uzbek scientist Khusainova Z. writes about this: “Presenting problems for primary school

students in simple language makes it easier for them to understand the problem and makes the learning process more interesting" (Khusainova, 2021).

Using visual materials

Pictures, diagrams, and drawings play an important role in making problems understandable. For example, explaining the problem "A boy had 5 books, he gave 2 to his friend. How many books are left?" through a picture helps students analyze the problem visually.

Using game elements

Solving problems through games arouses interest in students. For example, the game "Mathematical Treasure" is organized, and simple problems are required to be solved at each stage. Uzbek researcher Botirova Khilola writes about this method: "Game elements increase interest in mathematics among primary school students and ensure their active participation" (Botirova, 2022).

Giving real-life examples

Explaining problems through examples from students' everyday lives is an effective method. For example, "You have 20 soums in your pocket, and a loaf of bread costs 5 soums. How many loaves of bread can you buy?" will be understandable and interesting for students.

Step-by-step approach

A step-by-step explanation of the problem-solving process teaches students to analyze the problem. As in the example of the algebraic method above, each stage should be explained separately.

Work done to develop mathematics education in Uzbekistan

Based on the resolution of the President of the Republic of Uzbekistan dated May 7, 2020, a number of systematic works were carried out to develop mathematics education. Within the framework of this resolution, new textbooks and methodological manuals were developed for primary school students. Uzbek scientist Abjalova M.A. analyzed this process and wrote that "The work done to develop mathematics education based on the Presidential Resolution made it easier for primary school students to master mathematical problems" (Abjalova, 2021).

At the same time, special trainings and seminars were organized for teachers. Through these trainings, teachers learned modern methods for easily presenting problems. Uzbek researcher Alayev R.H. analyzed this process and noted that "Teacher training is an important factor in improving the quality of mathematics education" (Alayev, 2021).

Teaching primary school students to solve mathematical problems and presenting them easily plays an important role in the educational process. Arithmetic, algebraic, selection, graphic and practical methods provide effective approaches to solving problems. At the same time, methodological approaches appropriate to the age of students, visual materials, game elements and real-life examples play an important role in making problems understandable and interesting. The work done to develop mathematics education in Uzbekistan, in particular, the measures implemented on the basis of presidential decrees, have created a basis for primary school students to easily master mathematical problems. In the future, improving the skills of teachers in this area and introducing modern technologies will serve to further develop mathematics education through distance learning.

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