METHODOLOGY FOR TEACHING NON-STANDARD PROBLEM SOLVING METHODS IN MATHEMATICS LESSONS TO PRIMARY STUDENTS

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Annotation: This article presents information about the solutions to some non-standard problems given in the 3rd grade mathematics textbook for primary school students and the methods for solving them. It is stated that the age characteristics of students should be taken into account when explaining the problems.

Keywords: primary school, mathematics textbooks, non-standard and problematic problems, mathematical reasoning.

In teaching mathematics, especially to primary school students, it is important to form mathematical thinking and logical thinking skills. In this process, teaching methods for solving non-standard problems, along with standard problems, plays a major role. Non-standard problems help develop students' creativity, independent thinking, and problem-solving skills. Such problems encourage students to think clearly and logically, to find new solutions. Taking into account the age characteristics and level of knowledge of primary school students, special methodological approaches should be used in teaching methods for solving non-standard problems. Through these approaches, students not only master mathematical knowledge, but also develop their logical and algorithmic thinking.

In teaching mathematics to primary school students, it is important to teach them how to solve non-standard problems in addition to standard problems. Non-standard problems help develop children's logical thinking, creativity, and independent problem-solving skills. This article discusses effective methods and techniques for teaching primary school students how to solve non-standard problems. Non-standard problems are problems that cannot be solved by traditional methods and require students to think logically and creatively. Such problems are often related to real-life situations and encourage students to find new solutions. For primary school students, non-standard problems are very important for increasing their mathematical interest and teaching them to think independently.

When teaching elementary school students to solve non-standard problems, it is necessary to teach them to analyze problems, sort information, and draw conclusions based on them. For example, children's thinking skills can be improved by using various logical questions and riddles. Non-standard problems often have more than one solution. Encouraging students to find different solutions helps develop their creative abilities. For example, you can increase their creativity by offering students different ways to solve a problem. For elementary school students, visual materials (pictures, diagrams, tables) can make it easier to understand problems and solve them. Visual materials help children focus and give them the opportunity to understand the problem more clearly. Mathematical games, riddles, and questions and answers can arouse students' interest and teach them how to solve problems. Teaching through games is an effective way to focus children's attention and interest them in the lesson. A teacher can help elementary school students solve non-standard problems in the following ways.

Step-by-step problem analysis: Students should be taught to break down the problem into smaller parts and analyze each part separately. This method facilitates the process of solving the problem.

Understanding and correcting errors: When students make mistakes, instead of criticizing them, they should be helped to understand the reason for the mistake. This way, students will learn from their mistakes and will not make similar mistakes in the future.

Organizing group work: Dividing students into small groups.

According to Francis Bacon, “Mathematics is the door and key to all sciences.” In fact, students who love mathematics and work on problems by observing them can easily master all other sciences. Today, textbooks in this subject are being expanded with examples of critical thinking and problem-solving problems from international research assessment centers.

These non-standard problems are marked with conditional signs in our textbook, which, if they attract the attention of students with high intellectual potential, can discourage some students from studying mathematics. In the textbook for primary school students, such problems are presented one by one in each subject. These seemingly simple problems encourage long-term thinking, and since these students find it difficult to understand them at first glance, some children's dissatisfaction is noticeable on their faces when they see this sign the next time. In such situations, the teacher should come up with unusual ways to explain the problem in advance. Below, we will talk about solutions to some non-standard problems presented in the 3rd grade mathematics textbook.

Problem 1. A horse eats a pile of hay in one month, a goat in two months, a sheep in three months, and a rabbit in six months. How long will it take all the animals to eat this hay together?

Here, if we solve the equation by taking hay as x, we will have to use fractions, take x out of the brackets, and the answer to the problem will be half a month (15 days). The problem is that 3rd graders have not yet studied fractions and working with such a complex method. So, let's look at a simple way to explain the problem. The teacher can take 4 apples of the same size in the explanation and make some changes to the problem. "This one apple will be eaten by a grasshopper in 1 day, a black beetle in 2 days, a ladybug in 3 days, and an ant in 6 days. How long will it take them all to eat one apple?"

The teacher says: "Here are the apples, this one apple will be eaten by a grasshopper in 1 day, and the next apple will be eaten by a black beetle in 2 days, how many will it eat in one day?" - he cuts the apple in half. Students understand that a black beetle eats half of an apple in one day. The teacher divides the next apple into 3 pieces, and eats one of them in 1 day, the fourth apple into 6 pieces, and the ant eats only one of the 6 pieces in 1 day. One whole apple belongs to a grasshopper, and when the pieces are separated from each other, they form a whole apple. From this it can be understood that insects eat 2 whole apples in 1 day. How long does it take to eat one apple? Half a day. Returning to the original question, time is given in months. So, all the animals ate the hay in half a month, that is, in 15 days.

Problem 2. A chain of 129 stones is arranged in the following order: white stone, gray stone, black stone. Counting from the end, what is the 18th stone?

Solution: Stones of 3 different colors are arranged in a sequence. Therefore, we divide 129 by 3. If there is no remainder, the sequence ends with the 3rd color black stone, if 1 remainder, with a white stone, if 2 remainders, with a gray stone. 129:3=43, no remainder. We ask for the color of the stones starting from the end. Black, gray, white. To find the stone in 18th place, we divide 18 by 3, the answer

is 6, no remainder. Therefore, the stone in 18th place ends with white. The teacher explains the periodicity using colored papers.

In conclusion, it should be said that when these types of problems are explained on the basis of demonstration, children's imagination expands, they learn to reason mathematically, and they adapt to studying this subject with all its difficulties. It is advisable to use these types of problems more often in mathematics circles. Teaching elementary school students how to solve non-standard problems plays an important role in developing their logical and creative thinking skills. Through effective methods and techniques used by the teacher, students can be taught to think independently and use a creative approach to solving problems. Non-standard problems are an important tool in increasing children's mathematical interests and preparing them to solve complex problems in the future.

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