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SEARCH FOR DIFFERENT SOLUTIONS TO THE PROBLEM

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Abstract: *Finding optimal solutions to problems in mathematics lessons is a topical issue. This article discusses ways to find different solutions to problems in elementary school math textbooks.*

Keywords: *example, solution, problem types, theory, method, practice, task, feature.*

I. INTRODUCTION

Creative learning tasks play an important role in the development of learning and creative activity in primary school students. One such creative task is a problem-solving task with different solutions. Although the tasks in the form of “solve a problem in different ways” and “find another solution to a problem” in elementary mathematics textbooks are less important, teaching students to find as many different solutions to a problem as possible is one of the important tasks of every primary school teacher.

By solving the problem in different ways, the student develops the ability to think logically, which develops such qualities as comparison, reasoning, drawing conclusions.

II. MATERIALS AND METHODS

By solving the problem in different ways, it is possible to introduce students from the 1st grade to the process of studying two practical problems. It is based on the rules and properties of students to add numbers to a number (for example, 16 + 3 = 16 + 2 + 1), to divide numbers by a number (for example, 16-3 = 16-2-1), to add a sum to a number and to add a number to a sum in which case, the case will be examined on the basis of its content.

Below we will look at some of the tasks that can be solved in different ways.

Issue 1: Sabir had 5 fairy tale books. His mother and sister gave him 2 fairy tale books for his birthday. How many patient fairy tale books were there?

This is a two-step problem, and it is natural for 1st graders to solve it as 5 + 2 + 1 = 8 (pieces). Because as students become familiar with two-step problems, their computational skills of adding and subtracting numbers in 10 will be well-formed. Ask students to "solve the problem in other ways!" students will be left wondering if they are given an assignment. The reason is that they have not yet developed the skills to solve the problem in another way. The teacher can then ask and answer the following questions:

"How many fairy tales does Sabir have?" (5 pieces)

"Who else gave him a book?" (Mother and sister)

"How many books did your sister give you?" (1 ta). Oyisichi? (2)

- How much will Sabir's own books (5), books donated by his sister (1), books donated by his mother (2) all cost? How do we write it? (5 + 1 + 2 = 8 (ta))

So we solved the problem in Method 2, that is, by adding the number of books given to Sabir by his sister first, and then the number of books given by his mother, you found the number of all the fairy-tale books in Sabir.

- Think about it, is it possible to solve the problem in another way?

It is likely that a student will be found who can solve the problem in Method 3. According to this 3-method solution, the reader can observe approximately as follows:

Since Sabir's mother gave him 2 fairy tales and his sister 1 fairy tale book, he was given a book (2 + 1). Sabir himself has 5 books. So, Sabir's books were 5+ (2 + 1) = 5 + 3 = 8 (pieces).

Of course, solving this problem in three ways will be based on 3 cases of adding the sum to the number. However, by not discussing the problem as described above, the student will be able to solve the problem in different ways, and will be able to study the properties of the addition operation.

Issue 2: There were 13 ducks walking on the shore. First two of them, then one fell into the water and swam away. How many ducks are left on the shore?

A picture of the problem is given in the textbook. The teacher can prepare a moving (floating ducks) exhibition based on the picture in the textbook. It would be useful to teach students the options for solving the problem in different ways using this exhibition.

Method 1: There were 13 ducks walking on the shore. Initially, 2 of them fell into the lake and swam (2 paintings of ducks are shown moving in the lake). Then another duck fell into the lake and swam away. (Another 1 duck will be shown in the show moving the water into the water). On the shore (13-2) -1 = 11-1 = 10 ducks left. Instead of concluding from the text of the problem and the question that the solution of the problem should be the same, the students should be taught other solutions to the problem.

Method 2: Considering the above, students will know that the number of ducks left on the shore is (13-1) -2 = 12-2 = 10 (pcs) when 1 out of 13 ducks and then 2 of them swim into the lake.

Method 3: Students can observe as follows. There were 13 ducks walking on the shore. First 2 ducks fell into the lake, then 1 duck (2 and 1 duck picture shows the duck swimming in the lake). From this we can see that (2 + 1) ducks fall into the lake and swim away. So we find that there are 13 (2 + 1) ducks left on the shore. The solution for this method is as follows: 13- (2 + 1) = 13-3 = 10 (ducks).

Theoretically, this is a matter of how to subtract the sum from a number. However, during this period, students are not taught how to subtract the sum from a number. Such problems not only serve as a tool to prepare students to learn these cases of calculation, but also lead to the conclusion that children can solve a given problem in different ways.

Problem 3: 15 kg of apples and 9 kg of mandarins were placed in 3 kg in each bag. How many bags did you need?

The 2nd grader solves this problem by observing as follows. You need 15: 3 bags to place 15 kg of apples in 3 kg each. For 9 kg of mandarins you will need 9: 3 = 3 bags. So, for 15 kg of apples and 9 kg of mandarins you will need a total of 5 + 3 = 8 bags. Expression of problem solving: 15: 3 + 9: 3 = 5 + 3 = 8 (per bag).

"What else can be done to solve the problem?" The task makes students think. They can describe Method 2 of the problem as follows: As long as 15 kg of apples and 9 kg of mandarins are in bags, adding 9 kg to 15 kg can find out how many kilograms of fruit are in the bags in total. Divide (15 + 9) by 3 and find how many bags are needed for all the fruits, i.e. the solution of the problem is in the form of an expression as follows.

(15 + 9): 3 = 24: 3 = 8 (per bag)

This problem is about dividing the sum by a number, which can only be used when each additive divisor is a multiple of the number.

It should be noted that the properties of arithmetic operations, as well as computational methods (for example, adding to a number, adding to a number, subtracting from a sum, subtracting from a sum, multiplying a sum by a number, dividing a sum by a number, etc.) can be solved in different ways. always available. However, teaching primary school students to look for different solutions based on the content of the problem will increase their independent thinking and creativity.

Problem 4: The worker took 5 minutes to prepare 20 parts. If he makes more than one detail in one minute, how many parts will he make in 40 minutes?

It is advisable to give a brief summary of this issue in the table.

	In 1 minute	Time spent	Number of details
He has to prepare	?	5 minutes	20
Prepared by	?, More than 1	40 minutes	?

Depending on the table, different solutions to the problem can be given.

Method 1:

1) 20: 5 = 4 (detail) - should cook in 1 minute.

2) 4 + 1 = 5 (detail) - prepared in 1 minute.

3) 5 · 40 = 200 (details) - prepared in 40 minutes.

Method 2: (Let's solve the problem by asking a question)

1) How many more parts did the worker prepare in 5 minutes?

1 · 5 = 5 details.

2) How many details did the worker prepare in 5 minutes?

20 + 5 = 25 details.

3) How many times are there in 5 minutes in 40 minutes?

40: 5 = 8 times.

4) How many details did the worker prepare in 40 minutes?

25 · 8 = 200 details.

Method 3: (Let's solve the problem by asking a question)

1) How many times are there in 5 minutes in 40 minutes?

40: 5 = 8 times.

2) How many parts would a worker have prepared in 40 minutes if he had worked as before?

20 · 8 = 160 details.

3) If a worker makes more than 1 part in 1 minute, how many more parts will he make in 40 minutes?

1 · 40 = 40 details.

4) How many details did the worker prepare in 40 minutes?

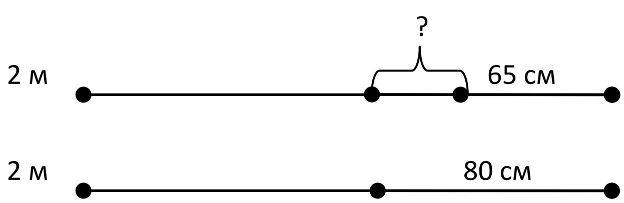
160 + 40 = 200 details.

Answer: 200 details.

Of the three solutions given, the solution of the problem given in the first method is more rational. Because it was done with three jobs, the rest of the methods were done with 4 jobs. However, engaging students in solutions with the last two methods strengthens their ability to solve the problem in different ways, developing their logical thinking.

Issue 5: There are two pieces of wire, each 2 meters long. 65 cm wire from the first piece and 80 cm wire from the second piece were used. In which section are there many wires left and how many wires are left?

Giving a brief summary of this problem in the drawing allows you to find different ways to solve the problem.



Given that 2 m = 200 cm, most students solve the problem as follows:

1) 200-65=135 (см)

2) 200-80=120 (см)

3) 135-120=15 (см) Answer: There are 15 cm more wires left in section 1.

Method 2: Students' attention is drawn to a diagram representing a brief condition of the problem. As can be seen from the drawing, 65 cm of wire was cut from the first piece and 80 cm from the second piece. So a lot of wire was cut from the second piece. It turns out that there is a lot of wire left in the first piece. To find out how many wires are left, you can subtract 80 cm to 65 cm. So, the solution of the problem is done in one work: 80-65 = 15 (cm)

Of course, the search for a solution to this problem in the second method requires a lot of research, mental work from the reader. Here the teacher should place numbers such as 1 m, 3 m, 4 m instead of 2 m and emphasize that these numbers do not affect the answer to the question.

Problem 6: One gang has 16 identical sticks and the second gang has 12 of the same sticks. How many squares can you make from all of these sticks?

This topic is given for the lesson of strengthening the topic of “Dividing the sum” and is aimed at strengthening the skills and abilities of students on this topic. Of course, it is gratifying that such issues are included in textbooks. It is safe to say that this issue falls into the category of multi-tasking. It is difficult to come up with all the possible solutions to the problem. Here are some solution options and we encourage readers to look for the remaining solution options.

Option 1: 1) 16 + 12 = 28 (chop)

2) 28: 4 = 7 (square)

Option 2: 1) 16: 4 = 4 (square)

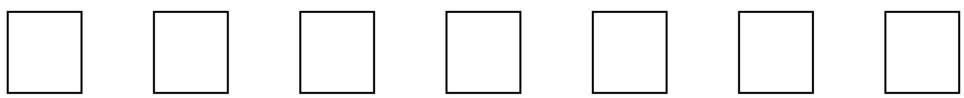
2) 12: 4 = 3 (square)

3) 4 + 3 = 7 (square)

These solution options are software demand options. The solution options below are intellectual in nature and encourage students to be resourceful, thoughtful, and sensitive. Here, if the task is practically done on the student's desk using counting sticks, the task will be of interest to the students.

Option 3: In fact, 16 sticks and 12 sticks together will be 28. This 28 is a product of 7 and 4. In this case, a square with one side equal to seven is formed.

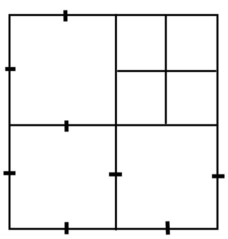
Option 4: If the side of each square is assumed to consist of one stick, then 4 sticks will be needed for one square. So you can make 7 squares out of 28 sticks:



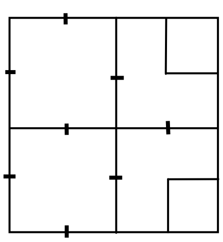
Option 5: If the side of each square is assumed to consist of two sticks, then 2 · 4 = 8 sticks are needed for one square. By taking 24 of the 28 sticks, 24: 8 = 3 squares and the remaining 4 sticks can form a single square whose sides are equal together. A total of 4 squares will be created.

Option 6: If we assume that the side of each square consists of 3 sticks, then 3 · 4 = one square of 12 sticks, 2 such squares of 24 sticks and one square with side 1 of the remaining 4 sticks . In this case, 3 squares are formed.

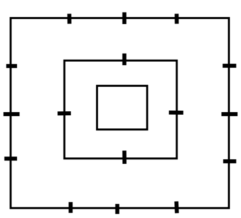
In the diagrams below, you can see the squares made up of 28 sticks.



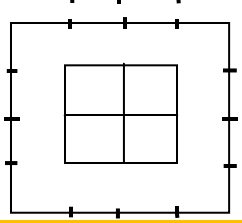
In this form, there are 9 squares, and it is possible to cite 4 different views (cases where small squares are in 2-, 3-, 4-squares).



In this form there are 7 squares, which can be given 48 different views.



There are 3 squares in this shape.



In this form there are 6 squares.

III. CONCLUSION

In short, the search for different solutions to problems allows students to develop logical thinking. Qualities such as perseverance and perseverance are nurtured in the student to overcome the difficulties encountered in the process of finding a solution to the problem.

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