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POSSIBILITIES OF USING PROBLEMED LEARNING IN TEACHING GEOMETRIC CONCEPTS IN PRIMARY GRADES

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ABOUT ARTICLE

Key words: Problem, learning problem, problem situation, problem problem, problem question, problem task, perimeter, straight line, perimeter of a broken line, perimeter of a triangle, perimeter of a rectangle, perimeter of a polygon.

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Abstract: In this article, an idea is given about the possibilities of using problem-based learning in the formation of geometric concepts in elementary school mathematics education. Problematic education includes such categories as problem, learning problem, problem situation, problem, problem question, problem assignment. Teaching concepts like straight-line, straight-line section, broken line, length of broken line, perimeter of a triangle, perimeter of a rectangle, perimeter of a polygon, which are studied in primary grades, using problem-based learning, allows students to quickly and effectively master these concepts, as well as to be able to apply the acquired knowledge in practice gives.

INTRODUCTION

Means teaching the educational material in a way that creates cognitive tasks and problems similar to scientific research in the minds of students. Problematic situations arise in the student's thinking activity, and they teach the child to objectively search and draw logical scientific conclusions.

The theory of problem-based education includes the following main categories: problem, learning problem, problem situation, problem issue, problem question, problem task.

METHODS

problem-based education was defined by M.A.Danilov, M.I.Makhmutov "didactic system", M.I.Makhmutov and M.P.Skatkin "type of education", V.Okon "method of education", D.V.Volkov "character of education", B.G.Zilbermon "method of construction of education", M.I.Kruglyak "

organization of education", interpreted by N.G.Dayri, T.V.Kudryatsev, A.M.Matyushkin and others as "principles of education". L.Sh.Levenberg and R.Ibragimov show that it is appropriate to call the concept of "problematic education" with the term "problematic approach to education".

Problem-based education is based on creating a problem situation. The formation of problematic situations in students' thinking activities cultivates such qualities as curiosity, sharp intelligence, independence, interest in learning and striving for creativity.

There can be different types of problem situations in primary education. Elementary school teachers have long used riddles, brain teasers, and related puzzles to pique children's curiosity. In such cases, the problematic situation is given in the content of the riddles, as well as in the problems formulated in such a way as to create a question in children and a desire to find an answer to this question. In this case, the child understands that his knowledge is sufficient for the correct answer. He felt that to be able to solve the problem, it was necessary to imagine what it was about and to find the right line of thinking. Tasks and problems that develop intelligence and ingenuity teach children to think logically, to find an interesting system of thinking about evidential material that is understandable for them.

RESULTS

We will consider the use of problem-based learning methodology in teaching some geometrical concepts below.

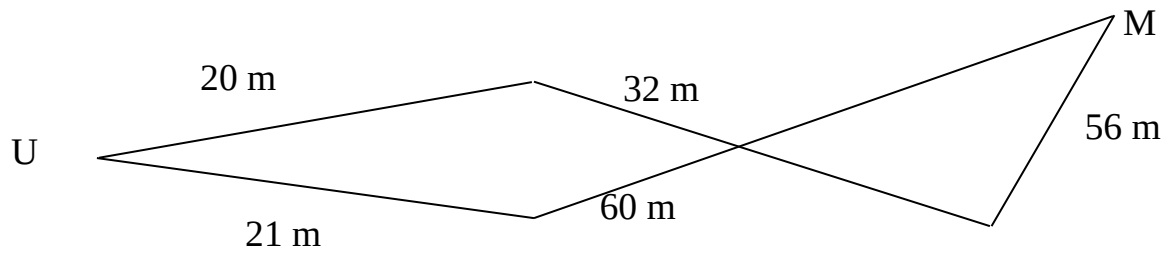
Introducing the concept of "broken line".

The teacher takes a piece of wire and asks the students "What kind of geometric figure is this?" asks the students with a question. (Students answer that this is a straight line segment). Then the teacher takes a piece of wire and cuts it into pieces, i.e. "breaks" it (folds it into "cuts"). Addressing the class: “I divided the cross section of a straight line into segments. What kind of figure did I make?" asks a problematic question to the students of the class.

Pupils give different opinions and say that a figure called " broken line " is formed. The teacher explains that a broken line is formed. During the discussion, each part of the broken line has one point of connection with the second part, that is, the end point of the first part is the beginning of the second part, the second part explains how the last point of the cut, the beginning of the third cut, and so on.

As a result, children learn about the structure of a broken line. Students they draw broken lines on their desks with counting sticks, matchsticks, and pencils. It is strictly emphasized that the start and end points of the dashed line do not overlap. What figure will be formed if they connect? Such a figure is called a closed line.

It is advisable to measure the length of the broken line as follows. Find the distance from the student's home to the school (drawing will be shown)



He says that he traveled 108 meters from his home to the school by roads of 20 meters, 32 meters and 56 meters. They calculate that the second road from the school to the house, i.e. 60-meter and 21-meter roads, will cover a total of 81 meters. Why are the distances from the student's home to the school

different? This question will be a challenging question for students. Students will understand that the second path is shorter than the first path , the sum of the cross-section lengths formed by the second path is smaller than the sum of the lengths of the cross-sections formed by the first path.

Through such an educational task, students will learn how to calculate the length of a broken line. Then the students are shown live broken lines of different shapes, and given the problems of measuring their lengths using a ruler and finding the length of the broken line.

It is useful to show two methods of finding the length of a broken line.

Method 1. Knowing the length of each piece of copper wire in the shape of a broken line, add the lengths of the pieces.

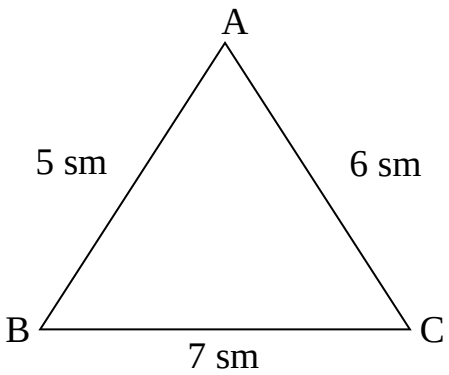
Method 2. A copper wire in the shape of a broken line is transformed into a straight line section and the length of the straight line section is found.

What if a broken line is drawn on a notebook and it is required to find its length? This will be a challenging assignment for students. If the students do not solve it, the teacher will help. The length of each piece is determined with the help of a circle and placed on a straight line one after the other, a straight line section equal to the length of the broken line is formed. The length of this straight line segment is found.

Introducing the concept of "Polygon Perimeter".

The problem of finding the length of a broken line directly passes the preparatory stage for finding the perimeter of a polygon. It is appropriate to first introduce the problem of finding the perimeter of a triangle, the simplest of polygonal representations.

For example, how much wire is needed to make a triangle with side lengths of 5 cm, 6 cm, and 7 cm? Students draw the shape of a triangle in their notebooks, put the side lengths and find that 5 cm + 6 cm + 7 cm = 18 cm.



The teacher conveys to the students that the sum of the lengths of the sides of a triangle constitutes the perimeter of the triangle. After that, students also calculate the perimeter of the square. For example, the teacher asks to find different ways to find the perimeter of a square with a side of 3 cm. In its place, this task is also included in the group of problematic tasks.

Method 1. Using a ruler and a circle, the four sides of the square are measured and placed sequentially on the straight line section, and the resulting straight line section is found.

Method 2. According to the definition of perimeter, the perimeter of a square is found as follows

3cm+3cm+3cm+3cm=12cm

Method 3. According to the property of the side of a square, that is, because the sides of a square are equal.

3·4=12 (cm)

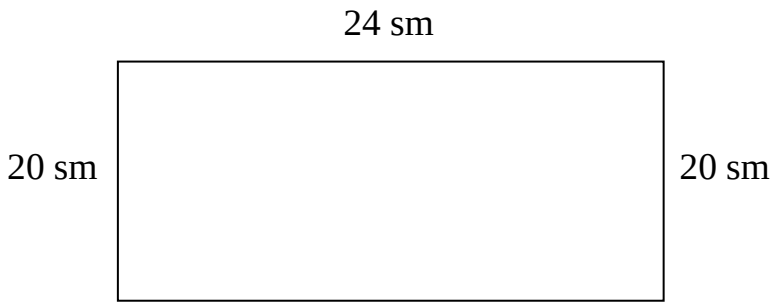
and addition operations are strengthened through ways to find the perimeter of a square .

After students learn to find the perimeter of a triangle, they are given exercises to find the perimeter of an isosceles triangle , and by solving such exercises, they acquire specific skills related to finding the perimeter of a triangle.

Introducing the concept of " Rectangular Perimeter".

rectangle, students can be given the following problem to solve: "Calculate the perimeter of a math notebook in different ways." To do this, the reader must have an idea that the notebook is rectangular . The teacher asks the students how to find the perimeter of a polygon ?

Now how do we calculate the perimeter of a rectangle? Each student adds the width and height of their notebook and says 24cm+24cm+20cm+20cm=88cm



Then the teacher asked again, "How else can this be solved?" by asking questions and engages students in independent thinking. Students calculate the perimeter of the notebook as 24cm·2+20cm·2=88 cm based on the problem of finding the perimeter of a rectangle. Now the teacher asks " is it possible to find the perimeter of a rectangle in another way?" raises the question.

a rectangle can be found by finding the sum of two adjacent sides of a rectangle and multiplying by two. That is (24 cm + 20 cm)· 2=44 cm·2=88 cm. The reader compares these three methods and comes to the conclusion that the last method is the most convenient way to find the perimeter of a rectangle, that is, two adjacent sides are added and the result is doubled.

and abilities on the topic "Polygonal Perimeter", the following creative exercises can be presented.

Exercise 1. Is 15cm wire enough to make a triangle with sides 3cm, 5cm and 6cm?

Exercise 2. Is 32cm of wire enough to make a rectangle that is 5cm wide and 12cm long?

Exercise 3. If the numbers 24, 7, and 5 are given for a rectangle, what is the relationship between its sides and perimeter?

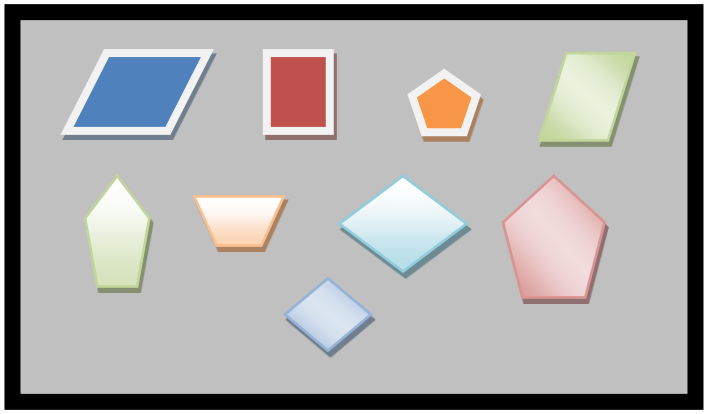
Exercise 4. Make a rectangle with a side of 4 cm and a perimeter of 10 cm. Find it in different ways.

Exercise 5. Make a rectangle with a perimeter of 20 cm. How many such rectangles can be made (the sides consist of natural numbers)?

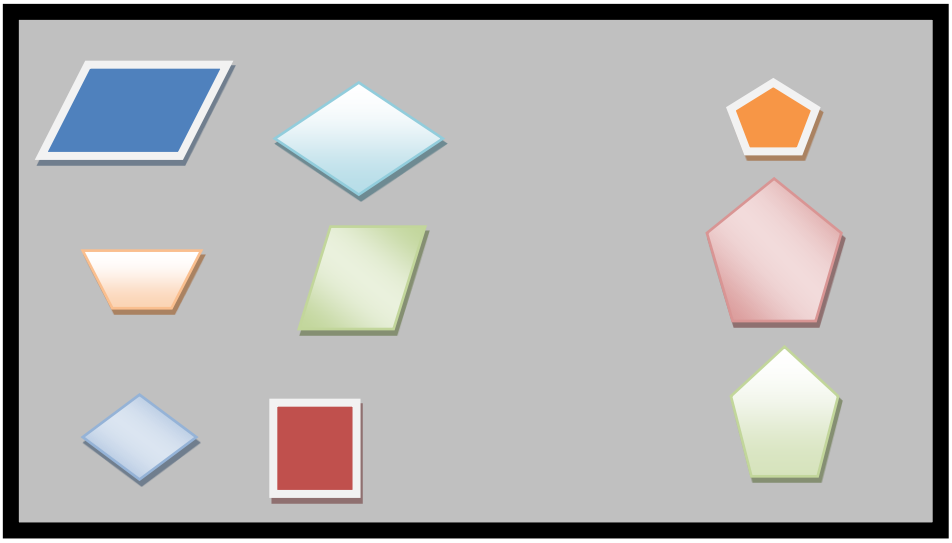
Exercise 6. If the side of a square is increased by 2 times, how many times will its perimeter increase? (increases by 2 times).

Introducing the concepts of rectangle and pentagon

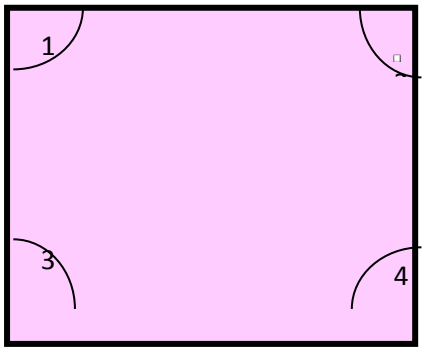
The teacher pastes the rectangles and pentagons of different colors and sizes on the magnetic board, then divides the rectangles into pentagons on one side and separates them.

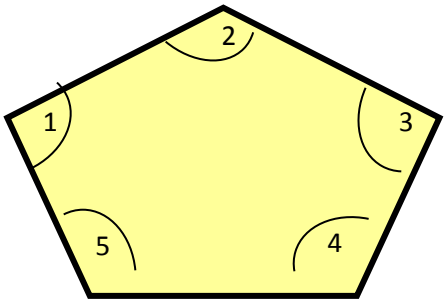


Tell me, why did I do this, why did I divide them into two groups?



- How are those on the right different from those on the left?
- As in triangles, do these have sides, angles, ends, how many?
- Who will name our four-cornered shape beautifully?
- Why did we call it "Rectangle?"
- If our four-angled shapes are rectangles, what will be the name of our five-angled shapes?





Show me a rectangle.

- Show and count the angles of a rectangle (pentagon).

CONCLUSION

In general, elementary school students learning geometric concepts based on problem situations form their students' independent thinking, creative approaches, and increase their interest in mathematics.

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