# USE OF MODERN INNOVATIVE TECHNOLOGIES IN SOLVING GEOMETRIC PROBLEMS IN PRIMARY FORMS

**[1]Ibraimov Kholboy Ibragimovich, [2]Kamola Pulatova**

[1]Director of the Scientific Research Institute of Pedagogical Sciences of Uzbekistan named after T.N.Kori Niyozi. Doctor of Pedagogical Sciences, Professor

[2]Doctoral student of the Scientific Research Institute of Pedagogical Sciences of Uzbekistan named after T.N.Kori Niyozi

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***Abstract.*** *This article discusses some effective ways of using interactive technologies in solving geometric problems in elementary grades. Also, with the help of geometric drawings and figures presented in the article, the advantages of taking mathematics lessons for elementary school students are explained through examples*

***Keywords:*** *geometric figures, point, straight line, section, broken line, polygon, angle, circles, formulas*

Along with the modernization of the education system in our country, its structural reconstruction, the implementation of innovations in the teaching process taking into account the modern achievements of education, science, technology and technology, economy and culture at the world level, the educational process it is necessary to create the necessary and sufficient conditions for the participants in terms of their capabilities and needs.

The main task of studying geometrical materials in elementary grades is to create clear concepts and ideas about geometric figures, points, straight lines, sections, broken lines, polygons, angles, circles. Therefore, the content of the system of exercises and geometric problems should be focused on observation, comparison, abstraction and generalization based on knowledge and skills of spatial concepts. First of all, it is to give students skills in measuring and drawing geometric figures, as well as with drawing and measuring tools, as well as with eyes, hands, etc. It also includes handguns, paper, sticks of different lengths, and making different figures from paper. There must be a ruler, a ruler triangle, and a circle in the classroom. Geometric materials should be taught appropriately. Geometric materials in primary grades are related to the materials taught in pre-school educational institutions and are somewhat more complicated. Even in preschool period, they are familiar with sphere, cube, circle, square, triangle, and right triangles.

In elementary grades, concepts should be given clarity, knowledge, and imagination. It is necessary to be able to show these concepts, name them, draw and even make figures of the given length on paper and blackboard. In the 1st grade, they get to know the dot. It gives you the task of putting dots in a checkered notebook and connecting them. Takes points and connects them with a straight line. After that, students will understand how to draw points, a straight line, or write and connect them using cross sections.

When they learn about polygons, they learn that their vertices are points. In the 2nd grade, points are marked with letters A, V, S, O, .... The task is to write and read the points lying inside, above and outside the circle and rectangle drawn on the board. From the 1st grade, the concept of a straight line is given in the performance of various tasks. At the same time, the concept of a curve is explained in exercises such as pulling and releasing a string. Now they acquire the skill of drawing correctly on paper and blackboard with a ruler, compare it with surrounding objects, and

say which ones are straight lines and which ones are curved lines. The section is also introduced during practical work. For example, he takes two points and connects them with a line. It is qualified that the intersection is part of the straight line between the points. After that, they get acquainted with units such as centimeters, millimeters, decimeters, meters for measuring cross-sections. When familiarizing with the elements of polygons, they will learn that its sides are cross sections. When marking points with letters in the 2nd grade, the marking of sections with two letters using points is introduced.

The concept of a cube, an angle, a circle is taught successively in all classes of primary education. In 1-10 (decimal) these are used as didactic materials. Students use them to count, compare numbers, and solve problems. Later they get acquainted with circle, triangle and square shapes. Gradually, they get acquainted with the elements of a polygon: sides, angles, vertices, etc. They learn that a triangle made of paper, wood, and plastic has 3 sides, 3 corners, and a tip, and then they make them themselves from different materials. In the next chapters, they will get acquainted with the types of triangles (right triangle, equilateral triangle, acute-angled triangle, obtuse triangle). On the basis of this plan, the correct angle is identified. After learning pentagons and hexagons, they generally call them polygons, and they state that the number of sides, vertices, and angles are the same. As in the 1st grade, the concept of a right angle is introduced, its explanation is carried out as follows. Take a piece of paper together, fold the ends together, and fold them twice to form an equal angle. They know that when they take any paper and fold it in two, equal angles are formed, and they accept to call them right angles. Compared to such right angles, they compare whether the existing angles around them are larger or smaller than it, and on this basis, they have the ability to accept the smaller of the right angles as acute angles. All corners of a rectangle are right and their opposite sides are equal based on folding. In grades 1-2, students are taught to make a rectangle by drawing, and in grade 3, they are taught to make a rectangle using a ruler and a triangle. On this basis, if the sides of a rectangle are equal, it creates a square. The concepts of polygons are explained and strengthened with the help of problems of different geometric content.

From the 2nd grade, they get acquainted with the concept of circle and circle. using a circle, the concept of their radius and center is introduced. They determine the equality of radii by measuring. By comparing a polygon and a circle, concepts are formed that the border of a polygon is a closed, broken line, and the border of a circle is a closed line. From the 2nd grade, they get acquainted with the concepts of a broken line, its length, the perimeter of a polygon and its measurement, closed and open broken lines. These concepts are reinforced in 2-3-4 classes with the help of problems:

For example:

1. If the perimeter of the square is 2 dm 4 cm. How many cm is its side and draw it.

2. Given a square with a house on one side and a wall on the other 3 sides. If the length of the house is 9 m, what is the length of the wall?

When solving such problems, it is useful to draw their drawings, in addition to solving ready-made problems, it is also required to give assignments to students to create problems with similar geometric content.

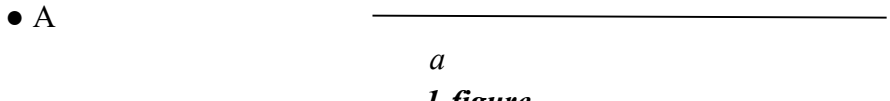
For example:

a) select and replace the omitted numbers in the condition of the problem: the perimeter of a rectangle is 25 cm, 3 sides are 5, 6, 7 cm, what is the fourth side?

b) create an inverse problem to the solved problem;

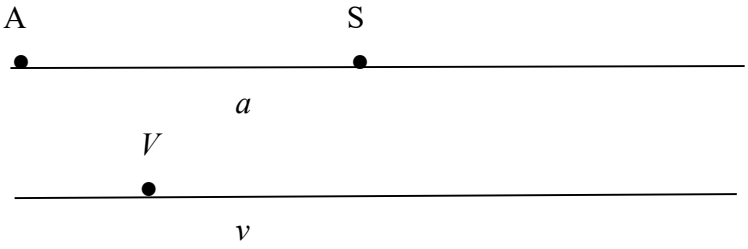
c) make problems based on these formulas. For example: S=a*v.

Geometry is widely used in practice. A point and a straight line are the main geometric figures on a plane. It is accepted to mark the points with the initial letters of the Latin alphabet A, B, C, D, .... Straight lines are denoted by lowercase letters of the Latin alphabet a, b, c, d, ....



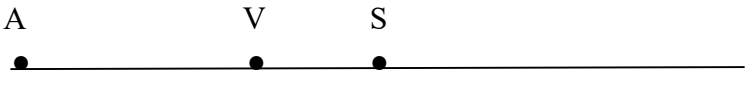

***1-figure***

In Figure 1, you see point A and straight line a. A straight line is infinite. We depict only a part of a straight line in the figure, but we consider this part to be infinitely extended in both directions.




***2-figure***

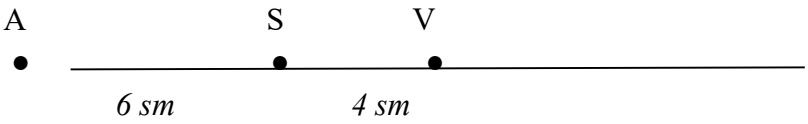
See Figure 2. You see straight lines a, v and points A, V, C. The points A and C lie on the straight line a. The points A and C belong to the straight line a, or the straight line a passes through the points A and C. Point V lies on the straight line v. It does not lie on a straight line. Point C lies on straight line a and on straight line b. Straight lines a and v intersect at point C. Point C is the point of intersection of straight lines a and v.




***3-figure***

See Figure 3. You see a straight line and points A, B, C on this straight line. Point V lies between points A and C, it separates points A and C from each other. It can also be said that points A and C lie on different sides of point V. Points V and C lie on the same side of point A, they are not separated by point A. Points A and V lie on the same side of point C. The part of a straight line consisting of all points lying between two given points is called a section. These two given points are called the endpoints of the section. The section is defined by showing its ends. When the AV section is called or written, it means the section whose ends are points A and V.

Measurement of sections. Various measuring devices are used to measure cross-sections. A ruler with dividing points is the simplest of such tools.

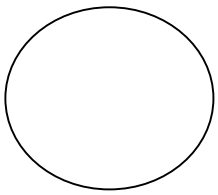



***4-figure***

Figure 4 The AV segment is 10 cm, the AS segment is 6 cm, and the VS segment is 4 cm. The length of the segment AV is equal to the sum of the lengths of the segments AS and VS. Each cross section has a fixed length greater than zero. The length of the section is equal to the sum of

the lengths of the parts separated by any point of this section. This means that if an arbitrary point S is taken on the AV section, then the length of the AV section is equal to the sum of the lengths of the AS and VS sections. The length of section AV is also called the distance between points A and V.

According to scientists, the length of any circle is about 3.14 times its diameter. So, to calculate the length of a circle, it is necessary to measure its diameter and multiply the resulting number by 3.14. The greater the diameter of the circle, the greater its length. For all circles, the ratio of the length of the circle to the diameter is the same number. This number is Greek π is denoted by the letter (pronounced "pi"). If the length of the circle is denoted by the letter S and the diameter by the letter d, then S:d=π will be. That is why S=πd Since the diameter of the circle is twice the radius, the length of the circle with radius r 2πr will be equal to The second formula for the length of a circle is created S=2πr.



***5-figure***

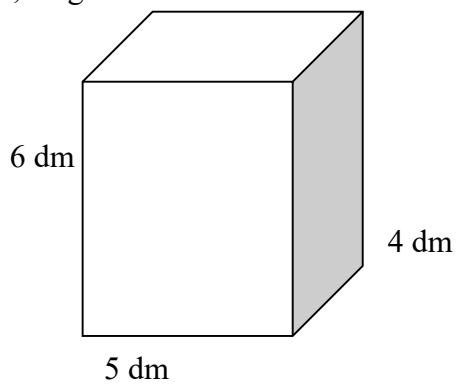
The face of a circle. The picture depicts a circle and squares AVSD and EFKM. The radius of the circle is r, so AVSD has a side of rand a face of $4r^2$. The face of the triangle EOF is twice smaller than the face of the square AEOF, so the face of the square EFKM is twice less than the face of the square AVSD, that is, it is equal to $2r^2$. The face C of the circle is greater than the square face EFKM, but less than the square face AVSD $2r^2 < S$.

Measuring and calculating the volume of a right-angled parallelepiped. To calculate the volume of a right-angled parallelepiped, it is necessary to measure its length, width, height and multiply the resulting numbers.

Example: Let's define the length of the parallelepiped with the letter a, the width with the letter b, the height with the letter h, and the volume with the letter V:

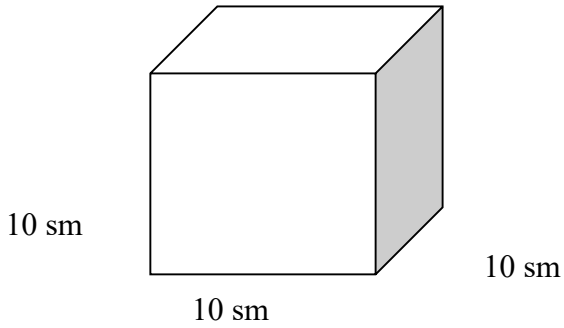
$V= a \cdot b \cdot h$.

Calculate the volume of a right-angled parallelepiped: length 5 cm, width 3 cm, height 6 cm; Length 6 dm, width 5 dm, height 4 dm.



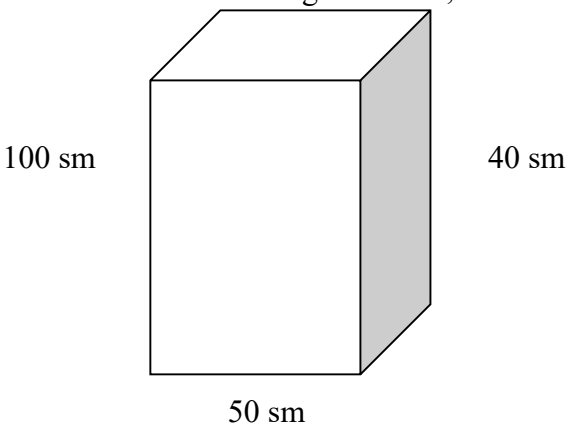

Measure and calculate the volume of the cube. A cube is a right-angled parallelepiped with equal length, width and height. To calculate the volume of a cube, you need to measure the length of its edge and multiply the resulting number three times. We denote the length of the edge of the cube with the letter a. In that case, the formula for calculating the volume of the cube will look like this.

$V=a \cdot a \cdot a=a^3$. All sides of the cube are equal, so length is 10 cm, width is 10 cm and height is 10 cm. We calculate the volume of this cube: V=10 sm x 10 sm x 10 sm = 1000 $sm^3$




The volume of a cube with an edge length of 1 dm is called a cubic decimeter. A cubic decimeter is written next to the numbers as follows: 1 cubic dm, 5 cubic dm or 1 $dm^3$, 5 $dm^3$.

Measurement and calculation of the total surface of the box. Measurement and calculation of the total surface of the box with length 100 cm, width 50 cm, height 40 cm.




1. First we find the face of the lower base. To do this, multiply the height by the width: 100 cm x 50 cm =5000 $sm^2$.

2. What is the area of the lower and upper base? 5000 $sm^2$ x 2=10000 $sm^2$

3. We find the face of one side. For this, we multiply the length by the height: 100 sm x 40 sm = 4000 $sm^2$

4. What is the area of both sides of: 4000 $sm^2$ x 2 =8000 $sm^2$

5. We find the face of the second side. To do this, we multiply the width by the height: 50 sm x 40 sm = 2000 $sm^2$

6. What is the area of the second two sides? 2000 $sm^2$ x 2 =4000 $sm^2$ Endi the full surface of the box is found. For this:10000 $sm^2$ + 8000 $sm^2$ + 4000 $sm^2$ = 22000 $sm^2$.

In short, during the lessons of solving geometrical problems, shortcomings and defects in the process of teaching multiplication and division operations were taken into account. In the organization of the work, the methodological and methodical foundations of the approach to performing arithmetic operations were relied upon. A multifaceted approach to students during classes with the help of solving problematic issues expands the possibility of psychological and pedagogical practical preparation of practical skills and qualifications, choosing different forms and methods of education. Solving geometrical problems can also be used in the works to educate students to become patriots by performing arithmetic operations.

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