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Exercises to develop spatial imagination of primary school students

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Abstract: This article describes the methods of forming spatial representations of primary school students in mathematics lessons, and the exercises of forming spatial representations of students through geometric figures.

Keywords: spatial imagination, geometric figure, plane, space, exercise.

Introduction

The formation of spatial imagination in students begins with the first lessons of mathematics in the 1st grade, using the ability of 6-year-olds to perceive form. Follow the sequence of learning geometric materials in the elementary school math curriculum, first of all to help children understand the basic spatial relationships: concepts such as "middle", "edge", "right", "left". It is necessary to form in the minds of the children. The relativity of top-down (left-right), left-right, top-down, bottom-up relationships among them leads to significant difficulties in children's performance.

The main practical steps in forming such a relationship should be to paint pictures of objects, draw "paths", mark objects with letters, with the help of which the result of mental activity begins to understand the experience of targeting in a familiar space and master the simplest graphic skills.

The formation of spatial perceptions of primary school students can be achieved through the use of certain topological features of surfaces (lack of correlation between shape and size). This can be done by coloring polygons, constructing flat graphs, or finding paths in a graph.

The development of spatial perception is inseparable from the formation of different positions of the object, changes in shape and position, different turns and shifts, image

correction and mental imagination. One of the exercises to develop these skills is to change the shape of a figure by stretching or squeezing using a grid of parallelograms.

The formation of spatial representations should be given constant attention in mathematics lessons. In order to get acquainted with the relevant concepts, it is necessary to follow a sequence that corresponds to the intuitive logic of children, which is accompanied by a didactic form of play based on the practical activities of students.

The formation of spatial representations can be done with younger students at the point of learning points, lines, cross-sections, rectangles, and so on. The organization of work on the orientation of flat and spatial geometric figures is very important in the formation of spatial imagination of primary school students. For this purpose, a number of exercises can be used, taking into account the direction in the plane and in space:

1. "What has changed? What hasn't changed?" exercise. Rectangles of different colors are arranged in a series, which change their position in space in a vertical direction, which is characterized by a "top-down" and "middle" relationship.

2. In the "Paint the figure on the right" exercise, you need to select a square that has the same pattern as the original, but changes its position when you lift it up in one turn. This exercise develops spatial orientation and reinforces concepts such as "right-left".

3. "What's the difference?" In the exercise, he formed and developed the spatial relations

"left-right", "top-down", "right-left", and thus dries up:

4. In the "Choose a shape for paint" exercise, the ability to turn right, left, up or down in one or more turns should be developed. For example, a left turn is made, in which the lower circle moves to the right.

Similar exercises can be done with other geometric shapes, as well as drawings. If you have math lessons, it is a good idea to use children's constructions, blocks, or, if they are not, simple wooden cubes made in school workshops. By writing inscriptions on one or both sides of the cube in the form of dots of different colors or painting them in different colors, you can create a whole series of exercises in different directions and at different levels to form and develop students' spatial imagination. This sequence can be conditionally divided into several groups according to the level of complexity of the students and the depth of formation of spatial perceptions:

1-group. "Working with the Cube Model." You can do the following exercises by pointing the cube at the front and pointing it at the student:

a) The cube is rotated to the left with one turn. What position does the cube model occupy? Find this position in the drawing?

b) Rotate the cube model to assume the position shown in the figure, and so on.

2-group. Working with an image in a given information system that correspond to the "body structure".

The cube is precisely oriented and rotates one turn to the right (left) in the reference system. Spatial processing results from the re-encoding of an image, that is, the separation of a flat-dimensional element from a three-dimensional space to a two-dimensional state. The child turns the cube only in front of him, not himself.

In short, it is advisable to use non-traditional methods and techniques, rather than accustoming students to ready-made solutions that hinder the development of spatial perceptions and, as a rule, to problems that find only one solution.

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