

## Formation of Mathematical Representations in Children of the Middle Group by Means of Didactic Games

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### ABSTRACT

*Preschool age is a period of active development and formation of the child's cognitive activity, but changes in the psyche that are important for its further development do not occur on their own, but are the result of targeted pedagogical influence. The article analyzes the methods and techniques for the formation of mathematical representations in children of the middle group in preschool education.*

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Mathematical education of preschoolers is the initial link in the system of continuous education (preschool educational institution - school - university) from the standpoint of restoring a single educational space in a new, activity-based education paradigm.

The results of teaching mathematics are not only knowledge, but also a certain style of thinking. Mathematics has great opportunities for developing the thinking of children in the process of their learning from a very early age. The formation and development of logical structures of thinking should be carried out in a timely manner. The gaps here are hard to make up. Psychology has established that the basic logical structures of thinking are formed approximately at the age of 4 to 5 years. The belated formation of these structures proceeds with great difficulty and often remains incomplete. The process of teaching mathematics is a complex process of influencing the consciousness and behavior of preschool children, deepens and expands their knowledge and skills, promotes the development of children's cognitive activity: perception, ideas, attention, memory, thinking, speech, imagination. Working with children 4-5 years old is a pleasure. They are already quite independent in everyday life and now show independence in judgments. They are very inquisitive. An adult becomes interesting to them as a source of new information. They better see and feel the experiences and moods of both peers and adults, they can pleasantly surprise you with their manifestations of care and understanding of your condition. Let the children sometimes take care of you, sympathize and help you. Show them that they are already big enough and can do something really important, pleasant and necessary for you. The plane of consciousness of children continues to expand rapidly. It already includes a rather deep time plan of the past and future. Speech is formed, the child freely uses it as a means of communication and cognition. At the same time, the role of the figurative form of presenting various information is still great. The child's need to build a coherent picture of the world is growing. There are two types of such connectivity: scientific and morphological. Now, when speech is basically formed, it can perform not only a communicative function, as at 3-4 years old, but also a mental function, express the child's thought and become the basis of a new form of his thinking - reasoning. Cognitive activity takes on a new form: the child actively absorbs information, can productively assimilate, memorize and operate with it. Thinking

becomes visual-figurative. If at the age of 3-4 a child had a need for adult respect for the manifestations of his will, now he needs respect for his independent thought, making the first steps. He seeks to express his opinions, ideas, needs attention to them from an adult, in the approval of his desire to understand something, in support. In this case, there is no need to strive to immediately give the child the "correct" answers to all the questions that arise for him - it is much more useful to create conditions for unfolding his own thoughts. Now adults are required to:

- make extensive use of illustrations for books, filmstrips, educational television programs, etc.;
- tell children as much as possible about life in different places and at different times;
- listen carefully and with interest to the reasoning of children, never criticizing them;
- Ask developmental questions.

Nosova E.A. says that it is desirable that by the end of 4 years, children can:

1. Distinguish and name colors and their shades, characterize lightness;
2. Distinguish between geometric shapes: circle, triangle, quadrilateral, pentagon, etc. Distinguish between straight and curved lines.
3. Understand superlative forms of adjectives - choose from a set of three objects the largest, longest, etc.
4. Understand superlative forms of adjectives - choose from a set of three objects the largest, the longest, etc.
5. Understand the words denoting the relative position of objects: in the picture, answer the questions of the educator who is on (something), above, below, next to, behind, in front of, between; what is close and what is far; what is ahead and what is behind; what is at the bottom of the sheet, what is at the top, and what is in the middle.
6. Arrange objects and pictures in rows:
  - in ascending order of the size of objects (first similar, then different);
  - in descending order of the size of objects;
  - in the order of the child's affairs during the day;
  - in the order of growth of a plant, animal, human;
  - illustrations for the fairy tale ("Turnip", "Gingerbread Man") in the order of the unfolding of the action.

The diagnostics of mathematical development was used as the main research method. The children were offered four tests, which included didactic games.

### 1. Methods for studying quantitative representations

Count yourself.

1. Name the parts of your body, which are one at a time (head, nose, mouth, tongue, chest, stomach, back).
2. Name the paired organs of the body (2 ears, 2 temples, 2 eyebrows, 2 eyes, 2 cheeks, 2 lips: upper and lower, 2 arms, 2 legs).
3. Show those organs of the body that can be counted up to five (fingers and toes).

Help Pinocchio.

Game material: Pinocchio toy, coins (within 7-10 pieces). Task: to help Pinocchio select the number of coins that Karabas Barabas gave him.

Ribbons.

Game material: strips of paper of different lengths - models of tapes. Set of pencils.

1. Color the longest “ribbon” with a blue pencil, paint over the shorter “ribbon” with a red pencil, etc.
2. Equalize all the "ribbons" in length.

Lay out the pencils:

To the touch, arrange pencils of different lengths in ascending or descending order.

Lay out the mats:

Arrange the "mats" in ascending and descending order in width.

2. Methods for studying ideas about geometric figures.

What form?

Game material: a set of cards depicting geometric shapes.

1. An adult calls any object of the environment, and the child calls a card with a geometric shape corresponding to the shape of the named object.
2. The adult names the object, and the child verbally determines its shape. For example, a triangle scarf, an oval egg, etc.

Mosaic.

Game material: a set of geometric shapes. Lay out complex pictures using geometric shapes.

Fix the rug.

Game material: illustration with a geometric image of torn rugs.

Find a suitable (in shape and color) patch and “fix” (apply) it to the hole.

3. Methods for studying spatial representations.

Correct mistakes.

Game material: 4 large squares of white, yellow, gray and black colors - models of parts of the day. Narrative pictures depicting the activities of children during the day. They are placed on top of the squares without taking into account the conformity of the plot of the model. Correct the mistakes made by Dunno, explain their actions.

Pattern.

Determine the direction of movement from yourself (to the right, to the left, forward, backward, up, down).

Game material: a card with a pattern made up of geometric forms.

Describe the pattern for yourself. Find the differences.

Game material: opposite image illustration set items.

Find differences.

A three-point system was used as criteria for assessing the level of mathematical development.

As shown by the results of diagnostics carried out at the beginning of the school year, in this group, the prevailing levels of mastering elementary mathematical concepts are the acceptable and critical levels. This required the development of a certain system of didactic games and exercises.

The relevance of the topic we have chosen is due to the fact that preschool children show a spontaneous interest in mathematical categories: quantity, shape, time, space, which help them better navigate things and situations, organize and connect them with each other, contribute to the formation of concepts.

Kindergartens take into account this interest and try to expand children's knowledge in this area. However, acquaintance with the content of these concepts and the formation of elementary mathematical representations is not always systematic, and often, one would like to wish for the best. The concept of preschool education, guidelines and requirements for updating the content of preschool education outline a number of fairly serious requirements for the cognitive development of younger preschoolers, part of which is mathematical development. In this regard, we are interested in the problem: how to ensure the mathematical development of children 4-5 years old, which meets modern requirements.

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