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EXPERIMENTAL STUDY OF ELEMENTARY MATHEMATICAL IMAGINATIONS OF MENTALLY DISABLED STUDENTS

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ABSTRACT

This article reveals the state of development of elementary mathematical skills in students with mental retardation. The condition of mentally retarded students' perception of size, solving simple problems, quantitative perception, concept of geometric shape, spatial and time perception was determined and analyzed. As a result of the experimental research, the perception of size, solving simple problems, quantitative perception, concept of geometric shape, mastery of spatial and time concepts were studied by mentally retarded children.

INTRODUCTION

In our country, serious attention is paid to the issues of children with developmental disabilities being brought up in the national spirit, mentally, morally, physically, and finding their place in society and social life, along with their healthy peers. One of the characteristic differences between children with developmental disabilities and their normally developing peers is insufficient development of mental processes. The general description of children with delayed development shows that their verbal abilities are always low. Also, there is a complex relationship between the development levels of a child's speech and his intelligence.

The attitude of nations to disabled persons who need special protection is expressed in the moral and moral indicators of society. Special educational institutions will be established for the education, upbringing and treatment of children with disabilities in physical or mental development, as well as children and adolescents who need long-term treatment. Sending children and adolescents to and from these educational institutions is carried out with the consent of parents or representatives of other legislative organizations according to the conclusion of the psychological-medical-pedagogical commission. Teaching mathematics involves not only the acquisition of certain knowledge and skills by students with mental retardation, but also the general development of cognitive abilities such as perception, memory, thinking, and imagination. The work carried out in this direction allows them to teach important methods of mental activity, perform mental operations such as analysis, synthesis, comparison, generalization, concretization. Mathematical materials and working with them greatly help children to develop logical thinking, to be able to express their thoughts clearly and fluently in oral and written speech. The concreteness of thinking of students with mental retardation and the lack of ability to generalize the observed phenomena lead to the fact that the concept of number and counting is very slow in them. It doesn't even develop enough by the time it goes to 1st grade. Successful learning of mathematics by students with mental retardation depends on their unique characteristics and difficulties in learning mathematical concepts. Therefore, the use of different methods in the development of mathematical knowledge of mentally retarded students gives good results. In particular, tasks such as providing education to the growing young generation, increasing attention to children in need of special education, and improving educational methods and methods were set.

The main results and findings

Peculiarities of mathematical concepts in students with mental retardation were considered in the scientific works of L. V. Kuznetsova, N. G. Morozova, A. A. Kataeva, E. A. Strebeleva. D. N. Isaev states that the cause of mental retardation is a brain injury.

The problem of formation of mathematical, in particular, quantitative concepts in literature on special pedagogy L.B. Baryaeva, G.V. Brizhinsky, A. P. Zarin, M. N. Perova, I. V. Chumakova and others are reflected in the research. The authors studied the characteristics of the development of mathematical

concepts and conducted research on the most effective methods of their formation in preschool children with intellectual disabilities. At the same time, studies show that preschool children with mental retardation have difficulties applying existing knowledge and skills to new situations, and do not know how to use them to solve new problems. In very rare cases, they cannot independently apply mathematical concepts in independent daily activities (including play activities), which leads to insufficient formation of acquired knowledge. At the same time, practical application of mathematical knowledge in various activities helps them to complete and understand it. Study of elementary mathematical concepts in students with mental retardation V. S. Azbukin, L. B. Baryaeva, N. Y. Boryakova, A. P. Zarin, O. P. Gavrilushkina, S. G. Eralieva, N. G. Morozova, G. M. Kapustina, A. A. Kataeva, L. N. Lezina, N. I. Nepomnyashchaya, E. A. Strebeleva, I. V. Chumakova. reflected in his studies. They reveal the theoretical and practical aspects of the formation of time, spatial, quantitative, geometric images. Despite the certain experience in forming the basic mathematical concepts of mentally retarded children, the issue of improving the ways of teaching elementary mathematical skills of mentally retarded students to use in everyday life is important in correctional-pedagogical work with mentally retarded children. have

On the basis of conversation, observation and the implementation of methods, it was possible to study the state of formation of elementary mathematical concepts and the skills of applying them in everyday life in mentally retarded students. The obtained results were processed in terms of quantitative and qualitative analysis.

The data obtained during the application of M. Montessori's method "Arrange by size" were qualitatively analyzed. For example, when Nargiza is implementing the "Differentiation by Size" method, "What is the size of this ball - big or small?" gave a clear and reliable answer to the question. He had no difficulty with the instruction, "Put all the big balls in this box and all the small balls in this box." He had no problems with the cubes. Also, "What did you put in the box?" when asked, he replied: "This box has big balls, this box has small balls." Zafar also used the method "Differentiation by size" and asked, "What size is this ball - big or small?" answered the question correctly and confidently. He had no trouble with the instruction, "Put all the big balls in this box and all the small balls in this box." He also placed the cubes. 4 students placed only balls or only cubes. For example, Anvar, using the "Differentiation by Size" method, asks "What size is this ball - big or small?" answered the question correctly and confidently. He had no difficulty completing the task when instructed to put all the big balls in this box and all the small balls in this box. But in placing the cubes on the same principle, it was difficult to understand where the big cube was and where the small cube was. And Sevara asked, "What size is this ball - big or small?" answered the question correctly, but hesitated. With the instruction "Put all the big balls in this box and all the small balls in this box" the actions changed frequently, made ambiguous actions. When placing the cubes on the same base, it was difficult to know where to place the big cube and where to place the small cube.

With the help of the teacher, 3 students separated. For example, when using the "Differentiation by Size" method, "What size is this ball - big or small?" answered the question correctly. When instructed to put all the big balls in this box and all the small balls in this box, he put all the balls in one box, but after the teacher showed him how to put them, he completed the task. . The same difficulties were encountered in placing the cubes. The results of the study of students' perceptions of size based on the method of M. Montessori "Place by size" We determined the following levels based on the results obtained from the study of the formation of imagination of mentally retarded students. High level was found in two students. Because they did not make a mistake and left both the cube and the ball according to their size. The average level was observed in 7 students, because they placed only balls or only cubes and made 1 error;

A below-average level was found in 3 students who placed only balls or only cubes and needed teacher support.

A low level was found in 1 student, who failed to complete the assignment.

The data obtained in the process of using the "arrange by size" method (according to S. D. Zabramnaya) were qualitatively analyzed.

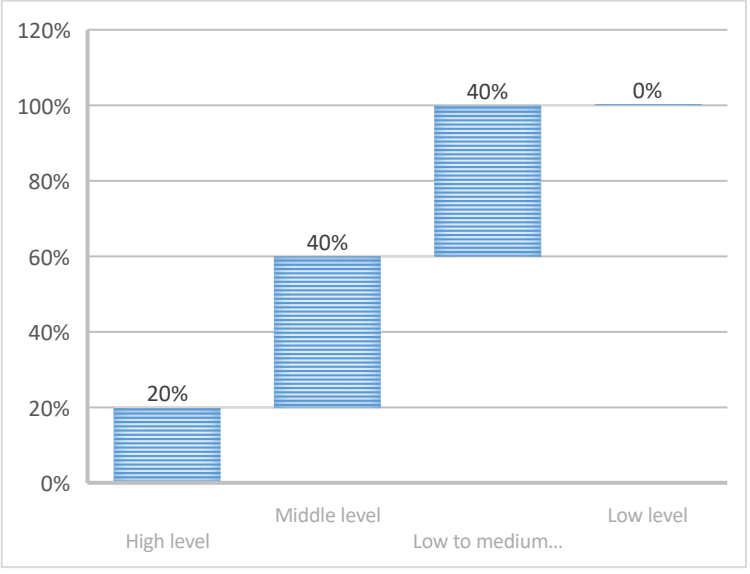
2 children correctly completed the task according to the "Place according to size" method. When performing the task, the following instructions were given: "Find the same objects, only they should be large, medium, small in size." They completed the task independently and told where it was big and where it was small. Nargiza completed the task independently and confidently. 4 students used different objects without following the instruction "Find only the same objects: large, medium, small". For example, adults took balls and balls. They did not work on the same subjects.

And 4 students completed the task based on the teacher's auxiliary questions: "Try to find only big and small things first."

Failure to complete the assignment was not observed.

The results of the study of students' perceptions of size based on the methodology of S. D. Zabramnaya "Place by Size" based on the results of the study

It is presented in diagram 2.



The analysis of the results of the exploratory experiment made it possible to determine the degree of formation of perceptions of size in students with mental retardation. Among students with mental retardation who participated in the identification phase of the experimental study, the following levels were determined:

High level was found in two students. Because they did not make a mistake and left both the cube and the ball according to their size.

The average level was observed in 4 students, because they placed only balls or only cubes and made 1 error;

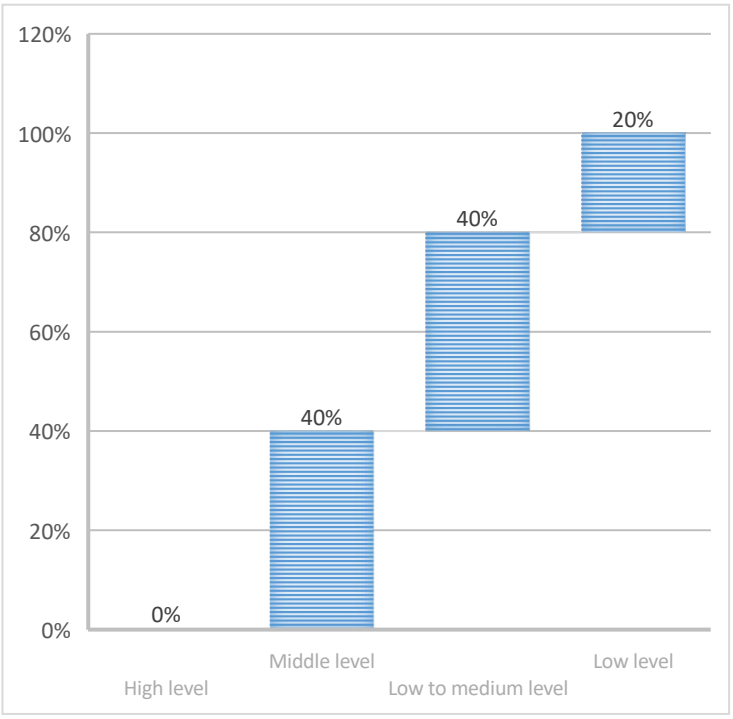
A below-average level was found in 4 students who placed only balls or only cubes and needed teacher support.

No low level was detected, no failure was observed.

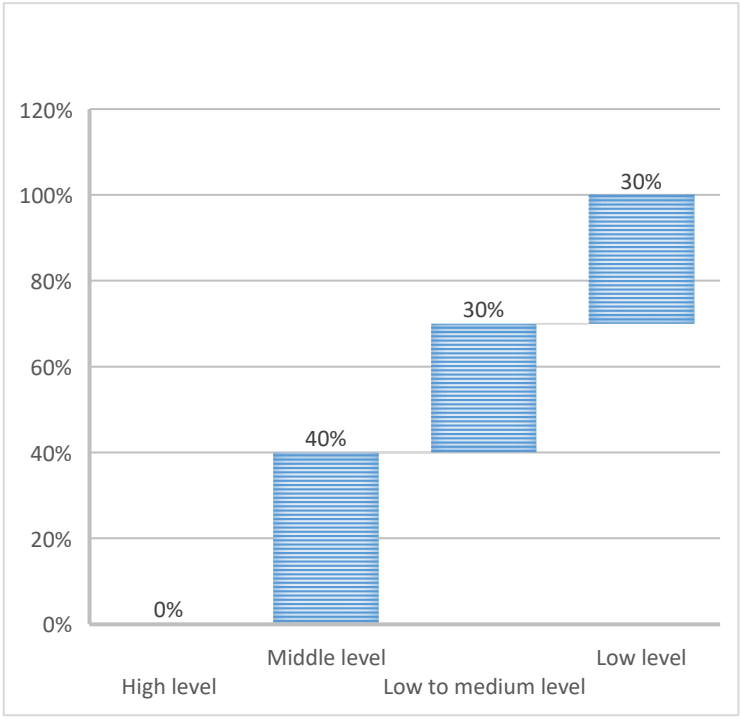
3. Solving simple problems

The data obtained during the application of the method of solving simple problems based on demonstrations (E. F. Bortnikova) were qualitatively analyzed.

Students with mental retardation solved both problems when solving the problems based on the exhibits, but they needed help solving the problem, solved the problem when the supporting questions were used.



The analysis of the distribution of students by the level of development of elementary mathematical concepts in solving simple problems presented in diagram 3 showed that the following levels were identified among the students participating in the identification stage of the experimental research.



According to the "Adaptation" methodology (according to E. Kolesnikova), the following levels of development of calculation in students were determined:

A student who matched subjects and numbers at a higher level and did not make mistakes was not observed.

Secondary level was determined in 4 students. Matched the subject and numbers but got an error

3 students were included in the lower intermediate level because they completed the task with the help of the teacher.

One student of the higher level was identified. He solved the examples independently and correctly.

The following levels were determined in mentally retarded students who participated in the identifying phase of the experimental research:

1. High level not detected. They could not solve the problem independently.
2. Intermediate level was observed in 4 students. They solved the problem with the help of the teacher. After the preliminary analysis with the teacher, they started solving the problems.
3. Below average level was found in 4 students. He solved one problem.
4. A low level was found in 2 students. They could not complete the task.

4. Quantitative imagination

"Adaptation" methodology

Experimental works conducted on the basis of E. V. Kolesnikov's "Adaptation" methodology were analyzed.

When applying the "Alignment" method, "Calculate the number of points in the cubes". Match the cube with the corresponding number." students who correctly completed the task were not identified. 4 students correctly counted the number of dots in the cubes. Made an error when matching the number to the number, but corrected the error and Zafar made mistakes in counting the dots on the cubes, but he found the mistakes and corrected them in the number matching task did it.

3 students did it with the help of the teacher. Botyr was confused and careless while counting the points. When he was asked to match the number with the number of dots, he could not finish it by himself, but did it only with the help of the teacher. Beautiful had difficulties in counting, she ignored her mistakes and did not count to the end. When adaptation was requested, teacher assistance was requested. 3 students could not complete the task E.V. Kolesnikov's "Adaptation" based on the methodology analysis of experimental work

A low level was observed in 3 children. They failed to complete the task.

"Examples" methodology

The data obtained during the application of the "Examples" methodology (according to S. D. Zabramnaya) were qualitatively analyzed.

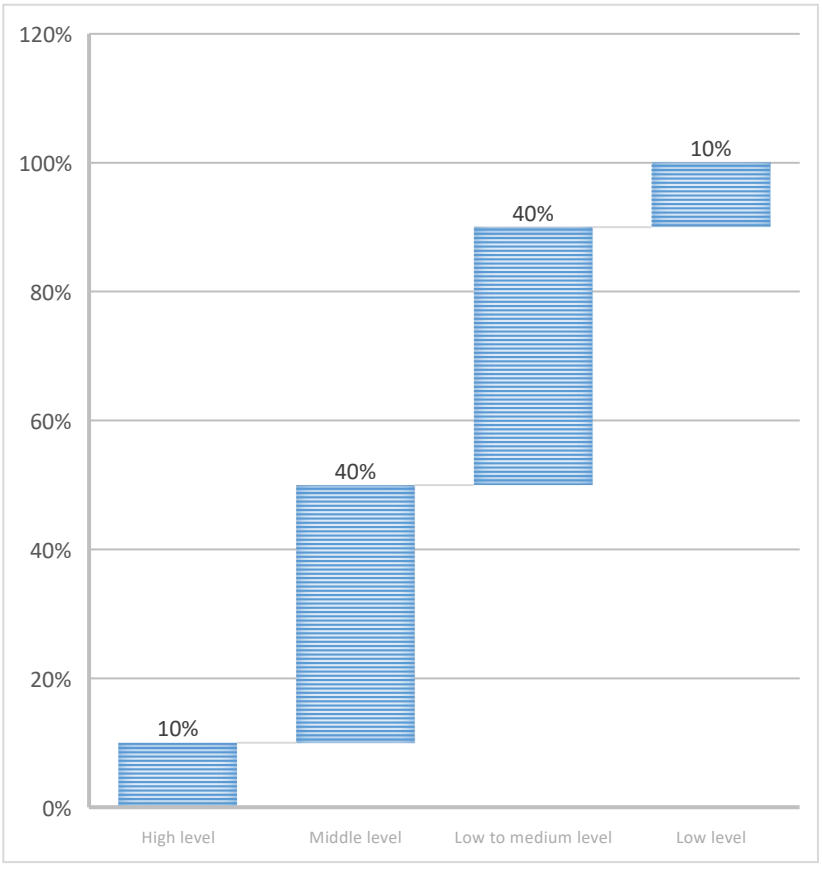
Students were offered examples based on the "Examples" methodology. One student independently completed the task in solving the given examples, the teacher's help and advice was not required.

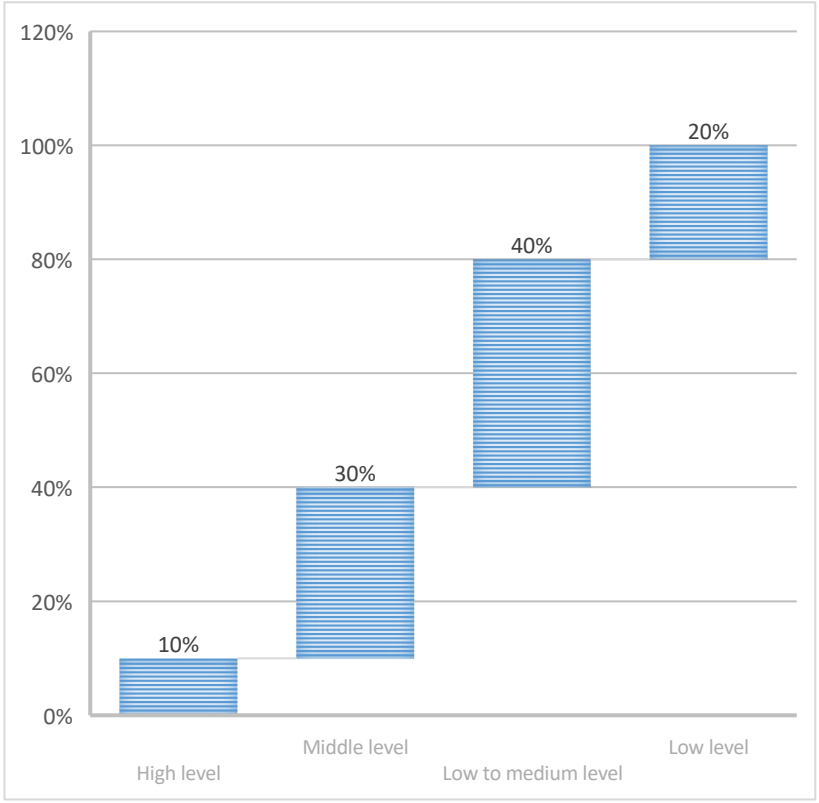
5 students made mistakes while solving the examples. They especially had difficulties solving examples of addition and subtraction beyond ten. Zamira made mistakes in solving these examples 8+6= , 14-6=.

4 students solved the examples with the help of the teacher. Nozima tried to complete the task, but required the teacher's help. Temir completed the task with the instruction "Solving examples", but required small instructions from the teacher. And Zafar fulfilled the task in solving the examples, but required significant help and supervision from the teacher. 2 students did not solve the example.

Quantitative analysis of the distribution of students by the level of solving examples using the "Examples" methodology (according to S. D. Zabramnaya) is presented in diagram 5.

Students' level of solving examples according to the "Examples" methodology (S. D. Zabramnaya)The level of development in olving the examples presented in diagram 5 showed that the following levels were found among students with mental retardation who participated in the identification phase of the experimental study:





3 children were admitted to secondary level. They made various mistakes when solving the examples.
He took out 4 children below the average level. They solved the examples with the help of the teacher;
2 children were identified as low level.
"Geometric Figure"
The data obtained during the application of the "geometric figure" method (according to E. V. Kolesnikova) were qualitatively analyzed.
One student of the tasks according to the "Geometric figure" method counted all the geometric shapes and named them;
4 students made mistakes while completing the assignment according to the "Geometric figure" methodology. Count how
many circles and triangles there are, and write your answer in the boxes." She had difficulty distinguishing between an oval and a circle while performing her task. Zamira replaced a rectangle with a square

4 students completed the task with the help of the teacher, but there were difficulties in distinguishing oval and circle, counting their number. Nozima completed the task based on the teacher's assistant questions. For example, show me a square? What are all their sides? After such questions, he distinguished the geometric figures.
One student could not complete the assignment.

The analysis of the distribution of students according to the level of mastery of geometric shapes presented in diagram 6 showed that the following levels were determined among students with mental retardation who participated in the identification phase of the experimental study:

A student was introduced to the upper level, and he counted all the geometric shapes and named them.

The secondary level consisted of 4 students. They made mistakes in placing geometric figures.

A lower than average level was observed in 4 students. They completed the tasks with the help of the teacher.

A low level was found in one student. He failed to complete the task.

"Top" methodology

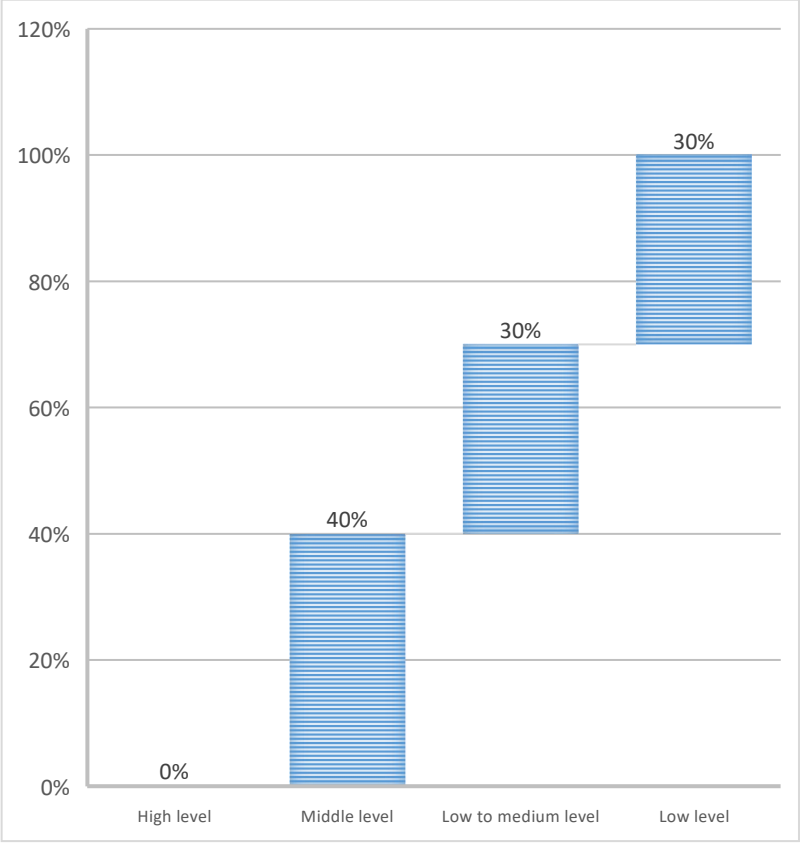
The data obtained during the application of the "Top" methodology (according to S. E. Gavrina) were qualitatively analyzed.

When applying the "Top" method, "See pictures. On the left side of the hedgehog, there is a picture of a bear on the right, a parrot on top and a bee on the bottom. They could not find the location of the objects depicted in the picture.

3 students made mistakes while completing the task. They mostly couldn't distinguish between the left and the right. For example, Zafar and Temur mixed up the pictures of the hedgehog standing on his right and left.
4 students completed the task with the help of the teacher. "Where's the left?" Where is the right? Where is the bottom? Where is the top? They tried to answer based on such questions.

Based on the help of the teacher Nozima, that is, leading questions: "Where is the left?" Where is the right? Where is the bottom? Where is the top? and answered only after a detailed analysis of each picture.

3 students could not complete the task.
Quantitative analysis of the distribution of students by levels according to the "Top" methodology (S. E. Gavrina) is presented in diagram 7.



The analysis of the distribution of students according to the level of development of spatial imagination, presented in diagram 7, showed that the following levels were determined among students with mental retardation participating in the identification phase of the experimental study:

Students with higher grades were not identified.

2. Secondary level was observed in 4 students. They made mistakes while completing the task.

3. Below average level was found in 3 students. They completed the task with the help of the teacher.

4. 3 students were admitted to the lower level. They failed to complete the task.

"Agenda" methodology

One student correctly completed the task "Fill in the missing days of the week" in the "Agenda" method. Also, “Look at the pictures. "Tell me what time of day they show" had no difficulty.

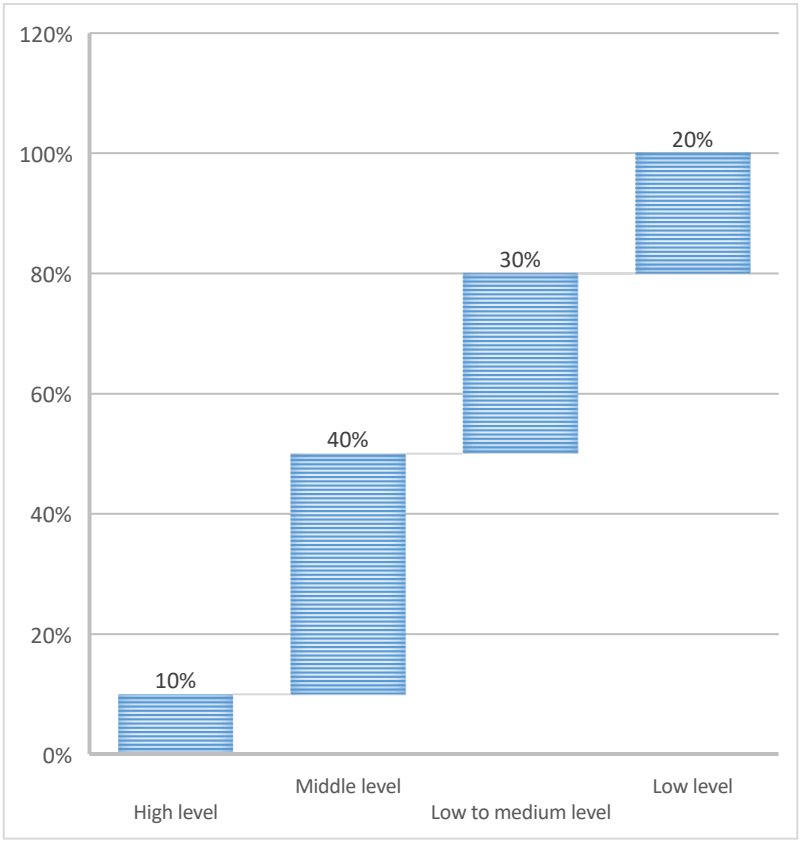
4 students wrote the missed days at the suggestion of the teacher while completing the task "Write the missing days of the week in the blank". For the task “Look at the pictures. Tell me what time of day is depicted on them, "was not difficult.

3 students completed the task "Write the missing days of the week in the space" with mistakes. They changed the names of the days of the week. Nargiza wrote that Thursday will come after Monday. By looking at the picture and saying what time of the day is depicted, they switched the pieces of the clock. For example, Timur could not separate evening and night.

4 students completed the task with the teacher's help and leading questions. They completed the days of the week and parts of the day with the help of the teacher.

2 children did not complete the task.

The situation of the students according to the time perception of the levels is presented in the 8th diagram.



The following levels have been determined according to the level of development of their perception of time presented in diagram 8.

1. A high level was observed in one student, he told the days of the week and parts of the day

2. 4 students were identified at the secondary level. They made mistakes in telling the agenda.

3. Organized 3 students below average.

4. 2 students of low level were admitted and failed to complete the task.

CONCLUSION

The results of the conducted research, the analysis of the state of development of elementary mathematical ideas of students, the size, solving simple problems, number and number, geometric figures, spatial and time ideas were shown in the diagram. The results of our study showed that elementary mathematical concepts and skills of applying them in everyday life among students with mental retardation were evaluated at a low and moderate level. It requires correction and development of mentally retarded students participating in the identification phase of the experimental research on the formation of elementary mathematical ideas and their application in their daily life.

Deficits in the first stage of cognition - perception are observed in students with mental retardation. The perception of students with mental retardation is characterized by the fact that it takes a long time to perceive the given educational materials, it is difficult to distinguish the main things, important signs and symptoms, and they do not understand the internal connection between the parts of the whole.

Pupils with mental retardation faced great difficulties in applying elementary mathematical concepts. In this regard, developing a correctional-pedagogical work system, taking into account that the use of didactic games with mathematical content in the process of forming elementary mathematical concepts gives positive results to more meaningful and

conscious acquisition of elementary mathematical ideas and their application in everyday life We believe that it is one of the necessary conditions.

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