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Approaches to the Use of the Game in the Development of Mathematical Representations

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ANNOTATION: Modern requirements for preschool education determine the need to use new organizational forms in which elements of cognitive, search, game and educational interaction would be integrated.

The purpose of this Law is to regulate relations in the field of preschool education and upbringing. The following basic concepts are applied in this Law: state preschool educational organization — an organization funded and managed by the state and providing preschool educational and educational services in accordance with the state standard of preschool education and upbringing.

It is necessary to interest children in mathematical material, to activate their logical mental activity, to entertain and captivate children, to deepen and expand their mathematical representations, to consolidate acquired knowledge and skills, to exercise children in the application of skills and knowledge in other activities.

KEYWORDS: Mathematics, representation, formation, play, development, preschool education and upbringing.

INTRODUCTION

Modern requirements for preschool education determine the need to use new organizational forms in which elements of cognitive, search, game and educational interaction would be integrated.

The purpose of this Law is to regulate relations in the field of preschool education and upbringing. Preschool age — the age of children from birth to seven years, until the moment of providing him with education in organizations of general secondary education;

preschool education and upbringing — a type of lifelong education aimed at educating and raising children, their intellectual, spiritual, moral, ethical, aesthetic and physical development, as well as preparing children for general secondary education;

the state standard of preschool education and upbringing — a set of mandatory requirements for the volume, content and quality of the educational process, the construction and equipment of a preschool educational organization, as well as the organization of healthy nutrition and safety of preschool children;

state educational program of preschool education and upbringing — a document that determines the volume and content of basic knowledge, skills and abilities to be acquired by the child, as well as characterizing the specifics of the content of education and upbringing, especially the organization of the educational process;

Preschool educational organization — a state and non-governmental organization that provides educational and educational services in the field of preschool education and upbringing;

METHODOLOGY

The creation of conditions that ensure the development of children, the realization of the potential of children is one of the priority social tasks of society and the state. A.S. Makarenko said that the child's play activity is the "zero cycle" of his future personality. He wrote: "Like a child at play, so in many ways he will be at work when he grows up. Therefore, the education of the future figure takes place, first of all, in the game. And the whole history of an individual as a figure and an employee can be represented in the development of the game and in its gradual transition into work ..." [20, p. 45]. A person's personality is formed in activity, the more diverse it is, the more versatile a person is. Play, learning, communication, work are the main requirements for knowledge, you should have a certain framework. The most important thing is to instill in the child an interest in knowledge. To this end, math

classes should be held in a fun way.

The game is a child's way to know himself, his abilities, possibilities, his limits. Only in play activities does a child show so much determination, perseverance and tirelessness. Play activity strengthens the child's useful habits and skills. Mathematics has a unique, developing effect. A.A. Stolyar writes: "It forms the techniques of mental activity and the qualities of the mind. Its study contributes to the development of memory, speech, imagination, emotions; forms perseverance, patience, creative potential of the individual" [22, p. 112].

The peculiarity of the "mathematician" is that he plans his activities in the best way, is able to predict the situation, expresses his thoughts more accurately and consistently, and is able to justify his position. Increasing the mental load in classes on the formation of elementary mathematical representations makes teachers think about how to keep children interested in the material being mastered, to keep active throughout the whole lesson.

The maximum effect in the study of mathematics can be achieved by using didactic games, entertainment, entertaining exercises and tasks in the classroom. At the same time, the use of fascinating and interesting mathematical material is determined taking into account the age characteristics of children, the tasks of their upbringing and comprehensive development.

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Playing, children acquire new knowledge, skills and abilities. Games develop perception, attention, memory, speech, thinking, develop creative abilities of children, they focus on the mental development of preschool children in general.

Organizing the management of the game, the life in the game of children, the teacher influences all aspects of the development of the child's personality: consciousness, feelings, behavior and will in general.

The game is important in the life of preschool children: it is work for them, play for children is learning, play is a serious form of their upbringing. With the help of the game, children learn about the world around them.

The use of didactic games and game exercises stimulates communication between children, between children and adults, because during the games these relationships begin to have a more emotional, more relaxed character.

An effective tool for the development of mathematical representations in children is the use of various types of didactic games. These games teach children to understand a number of complex mathematical concepts, form an idea of the ratio of numbers and numbers, numbers and numbers, develop orientation in the directions of space and time, teach them to draw conclusions.

For a child, interest in a didactic game is much more than an uninteresting task performed, the game attracts his interest, thereby becoming an impetus for the development of thinking, memory, attention, etc.

Games that promote the development of perception, memory, attention, thinking, and the development of creative abilities are generally aimed at the mental development of preschool children.

Let's consider the features of didactic games.

Didactic games are one of the varieties of games with rules that are aimed at solving certain tasks in teaching children [13].

RESULTS

They are widely used as a means of education, upbringing and development. The difference between a didactic game and an ordinary one is that all children necessarily participate in it. Its content, rules, and methodology are developed in such a way that for some preschool children who have absolutely no interest in mathematics, these games can become a starting point in the emergence of interest in the science of mathematics.

The creation of a game form of classes is carried out with the help of game situations and techniques that act for children as a means of stimulating and encouraging them to mathematical activity.

A didactic game is characterized by the presence of a certain structure that defines the game both as a game activity and as a form of learning. It can be argued that the game is a rather multifaceted concept. In practice, there are various types of games that can be used in educational activities.

According to the forms of the game, it can be divided into individual, group, pair. According to educational tasks – for games aimed at learning new material, obtaining new knowledge, games that form certain skills and abilities, and it is possible to distinguish a large group of games that have the character of knowledge control and generalizing repetition. By types, role-playing, cognitive, complex, business games can be distinguished.

The use of didactic play in educational activities is not an end in itself, it is a means of teaching and upbringing. A didactic game is not fun, and it is not worth considering it as an activity that gives pleasure for the sake of pleasure. The concept of "didactic

game" emphasizes its pedagogical orientation, this concept reflects the diversity of its application. In accordance with this, it can be argued that the use of didactic games in teaching mathematics is an important tool that makes the educational activities of preschoolers more optimized, and didactic games themselves are a means of developing mathematical concepts. The most significant is the consideration of the following issues:

1. The importance of didactic games and game situations in the system of other types of activities in the classes of FEMP.
2. The expedient use of didactic games and exercises at different stages of the study of mathematical material of various nature.
3. Development of methodological recommendations on the use of didactic games in the classroom, taking into account the didactic goals of the lesson and the level of mathematical preparedness of children.
4. Requirements for the content of play activities in the classroom in the light of the ideas of developmental and personality-oriented learning [14].

The value of didactic games is that in the process of conducting these games, children largely acquire new knowledge on their own, while actively helping in this.

The use of didactic games requires tracking the interest of preschool children in the game throughout the lesson. If there is no interest or fades, then it is not recommended to force the game on children, because in this case the game will lose its developmental, didactic, meaning; and the most valuable thing will fall out of the game activity - its emotionality.

If there is a loss of interest in the game, then the teacher needs to take the necessary actions in a timely manner that will lead to a change in the situation. It can be emotional speech, support for laggards, friendly attitude to children. If there is an interest in the game, then children are engaged with great pleasure, which, of course, has a positive effect on the assimilation of the necessary mathematical knowledge by children.

Expressiveness in the game is also important.. If the teacher speaks to the children indifferently, dryly and monotonously, then the children will treat the lessons just as indifferently, they will start to get distracted during the lesson. In these cases, it can be quite difficult to maintain the interest of children, to keep their desire to watch, listen, participate in the game. When this fails at all, then the children will not benefit from the game, it will only cause them fatigue. At the same time, a negative attitude towards classes will also arise.

The teacher himself must be involved in the game to some extent, otherwise his leadership and influence will not be very natural. The ability to quickly get involved in the game is an indicator of pedagogical skill. A game that is interesting to children, which gives them pleasure and satisfaction, has a positive impact on the conduct of subsequent games. Ways and means that increase children's emotionality for the game are not an end in themselves, but as a path that leads to the solution of didactic tasks.

The mathematical component in the content of the game is always brought to the fore. Only in this case, the game will fulfill its role in its purpose, namely, to contribute to the mathematical development of children and the education of interest in mathematics.

When organizing didactic games with mathematical content , the teacher should consider the following issues of the methodology of the game:

1. The goal of the game. What knowledge, skills and abilities in the field of mathematical development will preschool children acquire during the game?.

What point in the game should you pay close attention to? What other educational goals does the process of conducting the game pursue?

2. The number of children playing. Each game requires a certain number of players or a maximum number of them. This should be taken into account when organizing the game.
3. What didactic manuals and materials will be required for the game?
4. How to introduce the rules of the game to children with the least amount of time?
5. For what period of time should the game be designed?.

Will the game be exciting, entertaining for children? Will the children want to return to the game again?

6. How to organize the participation of all children in the game?
7. How to organize monitoring of children to

determine whether everyone is included in the work?

8. What changes should be made to the game in order to

increase the activity and interest of children?

9. What conclusions should be communicated to children in conclusion, after

the game (the best moments in the game, shortcomings, the results of mastering mathematical knowledge, give an assessment to individual participants of the game, make comments about violations of discipline, etc.)? [16].

Approaches to the Use of the Game in the Development of Mathematical Representations

The question of the expediency of using didactic games and game situations at various stages of the lesson is relevant. In particular, when conducting classes for the assimilation of new knowledge, the possibilities of didactic play are more inferior to traditional forms of learning. In accordance with this, it is recommended to use game forms of classes when checking learning outcomes, forming skills, developing skills, etc. Children should develop a positive attitude to education during the game.

Among the forms of conducting: games, it is possible to distinguish games-competitions for the best speed, quality, quantity; games-traveling through stations with alternating game situations, imitation of events; games - dramatizations, dramatizations aimed at finding solutions to problems; games - discoveries of research [10]. The main structural components of a didactic game include: rules, game design, game actions, cognitive content or didactic tasks, materials and equipment, game results.

Consider these structural components:

1) The game idea is expressed mainly in the name of the game. It is embedded in the didactic task that needs to be solved in the educational process. The game plan is often implemented in the form of a question, which, as it were, projects the course of the game, or can be presented in the form of a riddle. In any case, the game plan sets the cognitive character of the game, it imposes certain knowledge requirements on the participants of the game.

2) In each didactic game there are rules that determine the order of actions and behavior of children during the game, contribute to the creation of a certain working environment in the classroom. Therefore, the rules in didactic games should be developed taking into account the purpose of the lesson and the individual capabilities of the pupils who study in the game. By doing this, the teacher creates conditions for the manifestation of mental activity, perseverance, independence of children, for the possibility of a sense of success and satisfaction for each child. In addition, the rules make it possible to cultivate the ability to obey the requirements of the children's collective, to control the child's behavior. 3) Game actions are an important aspect of didactic games, they are regulated by the rules of the game, contribute to the emergence of cognitive activity of children, provide children with the opportunity to show their abilities, apply existing skills, knowledge, skills to achieve the goal of the game. Quite often, before playing actions, older preschool children are given an oral solution to a didactic task.

4) The basis of the didactic game is its cognitive content, which consists in mastering the knowledge and skills that are used in solving the educational problem that the game has set.

5) The equipment and materials of the didactic game largely includes the equipment of the entire lesson as a whole. This may be the availability of technical training tools. Also, this includes a variety of visual aids: models, tables, didactic material, flags that are awarded to children or winning teams.

6) A didactic game always has a certain result, which gives completeness to the game and is its finale. The result appears, first of all, in the form of solving the educational task set by the game and gives the pupils mental and moral satisfaction. For the teacher, the result of the game is an indicator of the level of achievement of the assimilation of knowledge by children or in their application [11].

Dzhumaev M.I identifies the following structural components in the didactic game:

1) didactic task;
2) game actions;
3) rules of the game;
4) result [12].

The didactic task is determined by the purpose of teaching and educational

influence. It is formed by the educator and reflects his teaching activity. For example, in some didactic games, counting skills are fixed or practiced in accordance with program tasks.

The game task is always implemented by children. A didactic task in a didactic game is carried out through a game task. It sets the game actions, becomes a task for the child himself.

Game actions form the basis of the game. The more diverse the game actions, the more interesting the game itself is for children and the more successfully the game and cognitive tasks are solved. With the help of didactic games, knowledge is provided not in a ready-made form, but through the process of self-discovery by a child.

The teacher is guided by the experience of creative activity, which is acquired by the child and gives him the right to his own choice of action. Different games differ in game actions both in their orientation and in relation to the players. These can be, for example, guessing riddles, role-playing actions, spatial transformations, etc. They are always connected with the game plan and proceed from it. Game actions are means of implementing a game plan, and may include actions that are aimed at performing a didactic task.

Rules of the game. The content and orientation of the rules are determined by general tasks aimed at the formation of the child's personality, cognitive content, game actions and game tasks.

Summing up – the result is summed up as soon as the game ends. This can be counting as scoring points; identifying children who have completed a better game task; determining the winning team, etc. At the same time, it is necessary to note the achievements of each of the children, to emphasize the successes of children who are lagging behind.

Didactic games bring joy to children – the joy of participating in joint activities with peers, the joy of victory, and the pleasure they received from doing mental work, develop an interest in mathematical activity, develop a desire to do it, and this is the key to further successful education in elementary school. Success in games inspires children to new victories.

Thus, as V.A. Kozlova notes, didactic play is a multifaceted, complex pedagogical phenomenon. It manifests itself as a game method of teaching children, a form of learning, independent play activity, a means of comprehensive formation of a child's personality, and is also a means of forming cognitive activity of older preschool children and mathematical representations.

The use of didactic games makes the pedagogical process more effective, in addition, they contribute to the development of thinking and memory in children, influencing the mental development of the child. Teaching and developing children in the process of play, it is necessary to strive to ensure that the joy of games turns into the joy of learning.

CONCLUSION

Preschool age is characterized by the fact that it forms the foundations of knowledge that a child needs at school. Mathematics, being a rather complex science, causes significant difficulties for children during school education. Many children may not have a mathematical mindset, in this case, preparing them for school, it is necessary to introduce children to the basics of counting in preparation for it.

Teachers know that mathematics is a powerful factor in the mental development of a child, the formation of his creative and cognitive abilities. The most important thing in the period of preparing a child for school is to instill in him an interest in knowledge. To do this, the educational and daily activities of children in the preparatory group for school should take place in a playful and entertaining way. Thanks to the game activity, you can concentrate attention and attract interest even from unassembled children. At first, they are only interested in game actions, and then they begin to be interested in what the game teaches. Gradually, children become interested in the subject of study itself.

Based on the results of the study , the following conclusions can be drawn:

1. The mathematical development of children at preschool age is manifested in qualitative changes in the forms of cognitive activity that occur as a result of the formation of elementary mathematical representations and logical operations in them.
2. Teaching elementary mathematics to preschool children should be given a special place in the educational process. This is due to a number of quite good reasons: the beginning of some children's education at school from the age of six, with a large amount of information that the child receives, with increased attention to information and communication technologies in educational organizations, with the intensification of the learning process, with the desire of parents to teach the child to know numbers, solve examples and tasks as early as possible, perform account operations.
3. Analyzing educational programs for the formation of elementary mathematical concepts, it can be noted that older preschool children master ways to establish and determine various types of connections between mathematical objects, relationships. For example, the establishment of correspondence between the elements of sets (the application of overlay techniques, matching elements of sets in the form of "one to one", the use of application techniques in order to determine the relations of quantities). By the end of the senior preschool age, children understand that the most accurate way to determine quantitative relations is to measure the magnitude and count of objects. Skills, counting and measuring skills become more meaningful and durable in children.
4. For the development of elementary mathematical concepts in older preschool children, it is advisable to use a variety of didactic games. These games give the child the opportunity to understand a number of complex mathematical concepts, form their ideas about how numbers and numbers, numbers and numbers relate, develop spatial and temporal representations, formulate conclusions.
5. Didactic games use a wide range of visual materials (sticks, geometric shapes, puzzles, constructors of various types, etc. – all this contributes to the fact that educational activities in mathematics take place in an accessible, entertaining, fun form. The use of logic games, mathematical puzzle games (for example, the Tangram game) contribute to the development of cognitive interest in children, the ability to carry out creative search, desire and ability to learn. A game situation of a problematic type, which is characteristic of almost any task of an entertaining kind, arouses cognitive interest in children.

Entertaining tasks develop children's interest in logic and mathematics, the evidence of reasoning, focusing on the problem and finding the right solutions for it, the manifestation of mental stress.

6. The conducted experimental search work consisted of three stages: ascertaining, forming, control.

At the ascertaining stage of the study, methods were selected and primary diagnostics of the level of formation of

mathematical representations was carried out. At the formative stage of the study, didactic games aimed at forming mathematical representations were developed and conducted

At the control stage of the study, repeated diagnostics of the level of formation of mathematical representations was carried out, the analysis of the results obtained was carried out.

Thus, the didactic game is a means of developing mathematical concepts in preschoolers in the cognitive and independent activities of children.

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