DEVELOPMENT OF LOGICAL THINKING WHEN TEACHING MATHEMATICS IN PRIMARY CLASSES

Umirbaeva Ulzada
Student of the Faculty of Primary Education
Nukus State Pedagogical Institute
https://doi.org/10.5281/zenodo.12798226

Abstract. This article examines the issues of developing logical thinking in mathematics lessons in primary school. The analyzes are presented using examples and samples.

Key words: mathematics, primary school, logical thinking, task, method.

INTRODUCTION

In the course of mastering mathematical knowledge, a primary school graduate will learn:

- carry out analysis of objects with the identification of essential and insignificant features;
- carry out synthesis as the composition of a whole from parts;
- carry out comparison, series and classification according to specified criteria;
- establish cause-and-effect relationships in the range of phenomena being studied;
- build reasoning in the form of a connection of simple judgments about an object, its structure, properties and connections;
- generalize, i.e., carry out generalization and derivation of generality for a whole series or class of individual objects based on identifying an essential connection;
- carry out the subsumption of the concept on the basis of object recognition, identification of essential features and their synthesis;
- establish analogies.

The graduate will have the opportunity to learn:

- carry out synthesis as the composition of a whole from parts, independently completing and replenishing the missing components;
- carry out comparison, series and classification, independently choosing the bases and criteria for the specified logical operations;
- build logical reasoning, including the establishment of cause-and-effect relationships."

MATERIALS AND METHODS

The main work for the development of logical thinking should be carried out with a task. After all, any task contains great opportunities for the development of logical thinking. Non-standard logic problems are an excellent tool for such development. The greatest effect can be achieved as a result of using different forms of work on the task. This is: Working on a solved problem. Many students only after repeated analysis realize the plan for solving the problem. This is the path to developing solid knowledge in mathematics. Of course, repeating the analysis takes time, but it pays off. Solving problems in different ways. Little attention is paid to solving problems in different ways, mainly due to lack of time. But this skill indicates a fairly high mathematical development. In addition, the habit of finding another way to solve will play a big role in the future. But I believe that this is not available to all students, but only

to those who love mathematics and have special mathematical abilities. The method of analyzing the problem is correctly organized - by question or from data to question. Representation of the situation described in the task (draw a "picture"). The teacher draws the children's attention to details that must be presented and which can be omitted. Imaginary participation in this situation. Breaking down the task text into meaningful parts. Modeling a situation using a drawing or drawing. Independent preparation of tasks by students.

Thus, the primary school teacher is faced with the task of developing a logical culture of students that would allow children to build conclusions, provide evidence, make logically related judgments, bore them. Logical culture also presupposes mastering the skills of organizing thinking: structuring the task at hand, based on the selection and distribution of operations necessary to solve it; determining the level of sufficiency of completed developments to ensure the planned result. The difficulty of developing a logical culture lies in the fact that the student masters educational material presented in ready-made, logically processed models: rules, descriptions, algorithms, educational texts, assignments. The student memorizes the rules and texts of the textbook, the teacher's explanation, and repeats ready-made definitions.

RESULTS AND DISCUSSION

Cognition as a process of reflection of the objective world by human consciousness represents the unity of the sensory and rational. Sensory component:

– the result of a person's perceptual interaction with the world around him

– occurs in three main forms: sensation, perception, presentation. Sensation is a reflection of individual sensory perceived properties of objects (color, shape, taste, size, etc.). as a result of a direct impact on the sense organs, a holistic image of the object is created.

Sensory cognition provides knowledge about individual objects and their external qualities. But it cannot provide knowledge about the causal relationship between phenomena (for example, the change of day and night and the rotation of the earth around its axis and around the Sun).

Understanding the world around us, a person strives to penetrate into the essence of phenomena and things, to reveal the laws of nature and society. this is not possible without thinking, reflecting reality in logical forms: concept, judgment, inference. A concept is a form of thinking that reflects objects in their essential characteristics (for example, mathematical concepts "number", "quantity", "equation", "expression", "problem", "geometric figure", etc.). Judgment is a form of thinking in which the connection between an object and its attribute, the relationship between objects or the fact of the existence of an object is affirmed or denied. For example, "The perimeter is the sum of the lengths of the sides of a polygon" is a simple proposition, "If the sum of the digits of a number is divisible by three, then the number itself is divisible by three" is a complex proposition. Inference is a form of thinking through which a new judgment is derived from one or more judgments. For example: "Natural numbers, the notation of which consists of three characters (digits), are called three-digit numbers. The number 567 is a natural number and is written using three signs (digits). This means that the number 567 is three-digit."

Let's consider the possibility of using propositional logic in a mathematics lesson when first-graders acquire knowledge about the composition of the first ten numbers (using the example of the number 6). Usually the composition of a number is studied by selecting two

arbitrary terms. for the number 6 - from numbers from 1 to 5. This approach is justified from the point of view of developing the skill of the mathematical operation of addition in a junior schoolchild. At the same time, a more abstract and deeper thought is not required from the child.

The introduction of the disjunction operation contributes to the formation of a deep, conscious understanding of this mathematical expression. Starting position – number 6. We need to find accessible logic for a primary school student. We invite the child to determine the place of the number 6 in the natural series of numbers. In this case, we rely on the fact that every previous number is 1 less than the next one. This means that the composition of the number 6 is 5 (the previous number) and 1. In the process of reasoning, we obtain the following series of provisions:

"6 is 5 and 1" or "6 is 4 and 1 and 1" or "6 is 3 and 1 and 1 and 1" or "6 is 2 and 1 and 1 and 1 and 1" or "6 is 1 and 1 and 1 and 1 and 1 and 1."

This is the logic of the independent statement of a junior schoolchild, which determines the composition of the number. The student sees that the composition of any number is determined by the sequence of the natural series of numbers. Such reasoning deepens the student's mathematical thought, and he comes to this thought independently.

As a consequence of the proposed logical statement, there is a compilation of examples of the form: 2 + 4, 1 + 5, etc.

The use of the above-mentioned logical operations contributes to the intensified development of the consistency and validity of the child's thinking, helps him in the mental actions of observing the studied facts, connections and relations judgments, comparisons, highlighting features, combining them into one general concept. As a result, students acquire the skills of correct reasoning and clear formulations, and their logical culture improves.

CONCLUSION

As can be seen from the examples given, with this approach, the student's thought becomes structured, consistent, and reasonable. In the process of mastering mathematical knowledge, a junior schoolchild acts not only according to the model proposed by the teacher or textbook, but also independently understands the material, which contributes to the development of his logical culture based on systematization, communication of many sensory images about the world of the universe, received throughout life, helps intellectual development and maintaining interest in learning.

References:

1. Baranov S.P., Chirkova N.I. Development of logic of thinking in primary schoolchildren // Elementary school. 2016. No. 12. P.22-25.
2. Kirillov V.I., Starchenko A.A. Logic: textbook. – M.: Yurist, 2016.
3. Approximate basic educational program of an educational institution. Primary school / [comp. E.S. Savinov]. - M.: Enlightenment, 2010.
4. Yakovleva S.G. Development of logical judgments in junior schoolchildren in the process of mastering educational material: dissertation. ... Ph.D. – M., 2012.