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DEVELOPING LOGICAL THINKING OF YOUNGER SCHOOLCHILDREN IN MATHEMATICS LESSONS

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Annotation: In the article pedagogical prerequisites are considered for the performance by younger school students of the system of assignments in mathematics as a method of forming logic acknowledges skills and means of the practical study of logical concepts. As a method, circular schemes, models of real objects and verbal descriptions of logical relationships are used without reliance on visual models at three different levels.

Keywords: Logical thinking, junior schoolchild, mathematics lesson, problem situation.

Introduction

Logical training is a necessary and important element in professional training future teachers of pedagogical educational institutions. It is inextricably linked with psychological-pedagogical, methodical and special training. Results of research indicate that it is expedient to formulate general logical skills in connection with the teaching basic disciplines. The most suitable discipline to formulate logical literacy of students is mathematics because of its characteristics as a science and academic subject. The content of general logical training of students as a whole is defined and represented by a list of skills that constitute the so-called logical literacy. Analysis of the existing practice of logical training primary school age children confirmed our conclusions. Development of methodological principle for the logical training of students in teaching mathematics is one of the main tasks of our research. In this regard, we can list the techniques for finding solutions of problems, which are the subject of special study and assimilation in our methodology.

Logical methods of thinking cannot independently be formed in children at the level of cognitive development when entering school. The teacher should lay the foundations of logical knowledge and skills. Considering the age opportunities of children, every action should be worked out in a material and materialized plan with the obligatory pronunciation of each operation. The work on formation of logical concepts and actions has propaedeutic nature, since it lacks logical terms and their definitions; moreover, it is not required knowledge of certain logical rules from school children. This work is aimed at the formation of pupil’s elementary logical knowledge and skills, which are the basis for further education. To formulate logical knowledge and skills in junior schoolchildren, we should use a variety of learning tools that contain material of different levels of abstraction. At the first level, at the lowest, as an indicative basis of action there appear specific items. As visual models of operations and relationships, we can use circular schemes. At the next level of abstraction, models of real objects are used, materialized using tables, matrices, drawings, diagrams, schemes that provide a visual support for the required logical actions. At the third level, verbal descriptions of logical relationships are used without reliance on visual models. This level is the highest by the degree of didactic material abstraction. These principles are realized in a specially designed system of tasks that provide formation of basic general logical skills. This system consists of five sections:

"Identifying the features of objects and operating them", "Working with logical words", "Classification", "Definitions", "Inferences". Fulfillment the problems system by junior schoolchildren is considered by us both as a method of formation logical knowledge and skills, and as a means of their practical study logical concepts, actions and disclosure of their connections. Thus, the work on logical training of junior schoolchildren should be based on the following foundations:

1) Organic connection with specific (strictly mathematical) content of the course;
2) Continuity between primary and secondary schools;

3) Gradual, purposeful and systematic formation of each skill;
4) Gradual increase of the abstraction level of the proposed material and the methods of operating it (from actions with real objects to operating their models and verbal descriptions);
5) Disclosure the general validity of logical relations and forms by attracting a diverse content (both mathematical and non- mathematical) to formulate the same skills;
6) Mastery by logical skills without using special terminology.

We have tried to implement these principles in a specially developed system of exercises, which provides for the formation of the entire complex of logical skills in the teaching junior schoolchildren to mathematics. Let us consider the ways and means that it is possible to develop the logical thinking of schoolchildren in the process of teaching. Results of the psychological and pedagogical research have shown that one of the main conditions that ensure the development of thinking is the preliminary setting of tasks which cause problem situations that activate the pupil's thinking activity. In connection with the consideration of this issue, we will dwell in greater detail on the concepts "problematic situation" and "problem". Problematic situation is "a difficulty realized by the subject, and he wants to find a method of its elimination". Saying about the fact that "the process of thinking always arises there when a person encounters with some kind of intellectual difficulty, this difficulty must be within the limits of possibilities of cognitive activity". It implies conditions for the emergence of a problematic situation: cognitive need, difficulty of the subject in performing an action, as well as cognitive capabilities of the subject.

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