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USING DIAGRAMMATIC PROBLEMS IN DEVELOPING LOGICAL THINKING IN PRIMARY STUDENTS

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Abstract. *This article examines the importance and methods of using diagrammatic problems in developing logical thinking in elementary school students. Logical thinking is an important skill that helps students solve problems, make decisions, and clearly express their thoughts in the educational process. Diagrammatic problems, by visually representing information, facilitate students' understanding and encourage them to identify logical connections.*

The article discusses the advantages of diagrammatic problems, their role in developing students' creativity and teamwork skills, as well as how they can be effectively used in the educational process. These approaches aim to improve the logical thinking skills of elementary school students, as well as make their learning process more interesting and effective. The article is expected to be a useful resource for teachers and education specialists.

Keywords: *mathematics, lesson, class, problem, diagram, logical thinking, teachers, students, addition, sum.*

The Concept for the Development of the Public Education System in our Republic until 2030 was approved, five initiatives were implemented, including a complex of measures aimed at creating additional conditions for the education of young people, state educational standards and subject curricula based on the development of mathematical abilities of primary school students through problem solving in general secondary education were developed, and normative foundations for participation in international research on assessing the quality of education were created.

Solving mathematical problems is an important component of teaching mathematics. It is impossible to imagine mastering mathematics without solving problems. Solving problems plays an important role in the development of students' mathematical abilities, mastering one or another theoretical material studied in primary school. Problems are formulated on the basis of a system of practical work. This means that the creation of each new concept always involves solving one or another problem that requires its application, which helps to explain the significance of this concept. In elementary school mathematics textbooks, problems are divided into simple and complex problems. Simple problems are those that can be solved with a single operation.

Problems that are composed of several simple problems and, therefore, can be solved using two or more operations are called complex problems. Simple problems serve as the basis for students to acquire the knowledge, skills, and abilities necessary to solve complex problems.

Problems are a useful tool for developing children's thinking skills and usually include some knowledge.

The search for this knowledge requires the problem solver to independently resort to analysis and synthesis, compare facts, generalize, etc. Teaching these methods of knowledge is one of the important goals of teaching mathematics.

When solving problems, interest in the subject develops, as well as independent freedom, demandingness, diligence, and goal-orientedness. Developing logical thinking and reasoning skills for elementary school students is an important part of the educational process. Logical thinking helps students solve problems, make decisions, and clearly express their thoughts. Diagrammatic problems serve as an effective tool for developing these skills. Life problems also help students expand their horizons when educating them. In primary grades, the study of problems is carried out by forming new concepts, moving from solving simple problems to solving complex problems. In this case, we will consider problems on addition, subtraction, multiplication and division, that is, simple problems on finding the sum of the same addends, dividing into equal parts, increasing or decreasing a number by several times, comparing numbers, finding unknown components of operations, as well as problems of various content, including problems that are solved by subtraction, problems on finding the sum of two factors and their inverse, problems in which the sum is reduced to multiplication and division, and other problems. If the given problem corresponds to or is similar to the problems solved in class in terms of its content, then students should be taught to independently find a way to solve the proposed problem. For this purpose, students should master the simplest general methods of approaching the solution of problems.

Mathematical problems are divided into simple and complex problems. Problems that can be solved with a single operation are called simple problems. Problems that are composed of several simple problems and therefore can be solved using two or more operations are called complex problems.

Working with diagrams in primary grades develops students' logical thinking and visual analysis of data skills. Below are the types and examples of diagrammatic problems designed for students in grades 1 to 4:

1. Types of diagrams

The following two types of diagrams are mainly used in primary school textbooks:

Bar diagram: Data is displayed in the form of vertical or horizontal columns.

Pie diagram: Shows the division of a whole into parts (mainly in grade 4).

2. Samples for problems

For grades 1-2: "My favorite fruit"

The diagram shows which fruits the students in the class like:

Apple: 8 children

Banana: 5 children

Pear: 3 children

Questions:

Which fruit do the students like the most?

How many more people like apples than pears?

How many children are there in the class in total?

For grade 3: "Books read per week"

The diagram shows the number of pages read from Monday to Friday:

Monday: 10 pages
Tuesday: 15 pages
Wednesday: 5 pages
Thursday: 20 pages
Questions:
How many times more pages were read on Thursday than on Wednesday?
On which day were the fewest pages read?
How many pages were read in total in four days?
For Grade 4: "Family Budget" (Pixel Chart)
A pie chart shows the family's monthly expenses in percentages or parts:
Food: 50%
Utilities: 20%
Clothing: 20%
Other expenses: 10%
Questions:
What is the largest expense?
If the family's monthly income is 5,000,000 soums, how much money is spent on food?

3. Methodological recommendations for working with the chart

Collecting information: Ask students to conduct a survey among their classmates (for example, "What kind of animal does anyone have at home?") and present the results in the form of a chart. Comparison: Always teach them to analyze using questions such as "how much more?", "how little?", "how many times?".

Interactivity: Create "living diagrams" on the desk using colored paper or cubes.

Diagrammatic problems are problems that represent data visually and require logical thinking. They can be in a variety of forms: graphs, charts, drawings, or tables. These problems allow students to analyze data, compare them, and draw conclusions.

Advantages of diagrammatic problems

1. Visual presentation: Diagrammatic problems present complex data to students in a more understandable and visible form.

2. Development of logical thinking: These problems encourage students to identify logical connections and increase their ability to solve problems.

3. Stimulation of creativity: Diagrammatic problems help develop students' creativity, as they have the opportunity to express their thoughts in a new way.

4. Teamwork: These problems encourage teamwork, and students learn from each other by solving problems together.

Ways to use diagrammatic problems:

1. Visualizing ideas: Students can express different ideas using diagrams. For example, in the topic of "Plant Life", showing their life cycle by drawing a diagram.

2. Problem Solving: Students use diagrammatic approaches to solve logical problems. For example, in answering the question "How can I collect the most fruit?", analyzing options using a diagram.

3. Classification and Comparison: Students can use diagrammatic problems to compare data and identify differences. This is useful, for example, when comparing data about different animals.

4. Existing knowledge and thinking skills are strengthened through application.

Having concrete material in the formulation of problems allows you to connect theory with practice, teaching with life. When solving problems, the student becomes convinced that many mathematical concepts have their roots in people's experience in real life. By solving problems, they get acquainted with important information in the field of knowledge and experience. For example, the content of many problems solved in primary grades contains the achievements of children and adults in the national economy, technology, sports and culture of our country.

The process of solving problems itself has a very positive effect on the mental development of students with certain methods, since it requires generalization of mental operations: analysis and synthesis, clarification and comparison.

For example: the student analyzes when solving the desired problem. Separates the question from the problem condition. Synthesizes when drawing up a solution plan, in which he uses clarification, as a result of solving problems of one type many times, the student generalizes knowledge about the connections between the given and searched numbers in problems of this type. Diagrammatic problems play an important role in the development of logical thinking of primary school students. They not only expand students' knowledge, but also increase their creativity and logical thinking abilities. The use of diagrammatic problems in the educational process makes the process of acquiring knowledge more interesting and effective for students.

Teachers should support these methods and help students achieve successful learning.

LIST OF REFERENCES USED:

1. Mirziyoyev Sh.M. Qonun ustuvorligi va inson manfaatlarini ta’minlash-yurt taraqqiyoti va xalq farovonligining garovi //Adolat, 2016-yil.-8-dekabr
2. Mirziyoyev Sh.M. Tanqidiy tahlil, qat’iy tartib-intizom va shaxsiy javobgarlik - har bir rahbar faoliyatining kundalik qoidasi bo‘lishi kerak.-T.: O‘zbekiston, 2017 y.
3. Mirziyoev SH.M. Erkin va farovon, demokratik O‘zbekiston davlatini bir galikda barpo etamiz. Toshkent - «O‘zbekiston». 2016. 13-14
4. “Oliy talim tizimini 2030 yilgacha rivojlantirish konsepsiyasi” 2019-yil 8-oktabr. PF5847 O‘zbekiston Respublikasining “Ta’lim to‘g‘risida”gi Qonuni. O'RQ-637-сон 23.09.2020. Ta'lim to'g'risida - LEX.UZ
5. Axmedov M., Abduraxmonova N., Jumaev M.E. Birinchi sinf matematika darsligi (metodik qo‘llanma). Toshkent. ―Sharq‖ 2005 yil.,
6. Bikbayeva N.U, R.I.Sidelnikova,G.A.Adambekova. Boshlang’ich sinflarda matematika o‘qitish metodikasi. (O‘rta maktab boshlang_ich sinf o‘qituvchilari uchun metodik qo‘llanma). Toshkent. ―O‘qituvchi‖ 2006 yil.
7. Jumaev M.E, Boshlang’ich sinflarda matematika o‘qitish metodikasidan praktikum. (O O‘YU uchun). Toshkent. ―O‘qituvchi‖ 2014 yil. “Maktabgacha ta’lim” jurnali maqolalari