

PRINCIPLES OF TEACHING PROBLEM SOLVING IN PRIMARY GRADE MATHEMATICS LESSONS BASED ON A COMPETENCY-BASED APPROACH

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Abstract: The article examines the competence-based foundations of the formation and development of skills and competencies in solving text problems in primary school students, describing the importance of units of measurement, the role and place of modeling, its types and methods of using them in solving text problems.

Keywords: text problem, simple problem, complex problem, mathematical modeling, graphic modeling.

INTRODUCTION

A large part of the elementary school mathematics course is related to word problems and their solution.

A word problem is a problem in which the quantitative aspects of some process, event, phenomenon are expressed in words and the unknown value of some quantity is required to be found based on the information and relationships given in the text. Each word problem consists of conditions and requirements that express the relationship between certain objects. These objects, conditions and requirements can be one or more.

MAIN PART

For example, let's look at the following problem from the 3rd grade mathematics textbook.

Problem 391. 24 packages of gifts were brought to the kindergarten. Each package contains 4 candies, 3 cookies, and 2 apples. How many candies, cookies, and apples are there in the packages?

The objects of the problem here are the package, candy, cookies, and apples.

Problem conditions:

1. 24 packages of gifts were brought.
2. Each package contains 4 candies.
3. Each package contains 3 cookies.
4. Each package contains 2 apples. Problem requirements:
5. How many candies are there in the packages?
6. How many cookies were brought in the packages?
7. How many apples were brought in the packages?

In the condition of the problem, the quantitative or qualitative relationship between the objects is given. Requirements are often expressed in the form of questions. The condition and the requirement are organically interconnected.

Problem 128. The length of the first section is

15 cm, the length of the second section is 5 cm. How many centimeters longer is the first section than the second? How many times shorter is the second section than the first section?

Problems on the relationship between units of measurement of quantities such as length, area, weight, time. These problems involve students in the following areas: length such as millimeter (mm),

centimeter (cm), decimeter (dm), meter (m), kilometer (km); area such as square millimeter (mm²), square centimeter (cm²), square decimeter (dm²), square meter (m²), hectare (ha); It involves the formation and development of knowledge about units of measurement of time, such as grams (gr), kilograms (kg), pounds, centners (sn), tons (t); units of measurement of time, such as seconds (sec), minutes (min), hours (s), days, months, years, centuries. With their help, students master the relationships between units of measurement of the same type and acquire the skills and qualifications to use them. Let us give an example from a 3rd grade mathematics textbook.

Problem 573. Each lesson at school lasts 45 minutes. There will be a 5-minute break after the first and second lessons, and a 15-minute break after the third lesson. How long will it take from the start of the first lesson to the end of the fourth lesson?

1. Fraction problems. If a word problem asks for a quantity and asks to find a part of it, or if a part of a quantity is given and the whole quantity is found, then such a problem is a fraction problem. By solving them, students will be prepared for teaching topics related to fractions. Let's give an example from the 4th grade mathematics textbook.

Problem 21. A child bought a notebook for a third of the money he had - 120 soums. How many soums did the child have before?

2. Problems on motion. The motion of a body can be the main object of problems of various contents, including those on shares. However, it is possible to distinguish a separate type of problems on motion. Such problems are solved based on the relationship between the distance traveled - s , the speed of movement - v , and the time of movement - t . In this case, the movement is considered to be straight.

When modeling a text problem, it is necessary to pay special attention to the correct choice of the appropriate action. The words "more", "more", "came", "together" and other similar words found in the text of the problem encouraged students to use the action of addition, and the words "less", "came", "came", "sold" encouraged students to use the action of subtraction. Problems where the relationship between quantities is given indirectly also occur.

Competency-based education (CBE) emphasizes learners' ability to demonstrate their understanding through action. It focuses on what students are able to do with their knowledge, rather than what they merely know. In the context of primary mathematics, this means moving beyond the memorization of formulas or procedures to fostering deep engagement with mathematical concepts. CBE requires that students be given opportunities to analyze, strategize, reason, and reflect—all within the framework of solving relevant and often complex problems.

In problem solving, competencies include cognitive flexibility, persistence, strategic planning, self-monitoring, and the ability to make connections across different mathematical domains. For young learners, these competencies must be nurtured incrementally, through carefully designed instructional strategies that balance challenge and support. CBE allows for differentiated learning pathways, enabling students to progress at their own pace and receive feedback that is formative rather than summative in nature. This principle is particularly important in problem solving, where the process is as valuable as the solution itself.

In a competency-based learning environment, the teacher functions as a facilitator, guide, and co-learner rather than a lecturer. Their role includes curating meaningful tasks, providing timely feedback, fostering a growth mindset, and maintaining a classroom culture that celebrates effort and perseverance. Teachers must also be responsive to individual learning needs, providing extensions for advanced learners and supports for those who need remediation.

Professional development is critical in equipping teachers with the skills to design and implement problem-solving instruction effectively. Educators need training in developing open-ended tasks, using formative data to inform teaching, and creating inclusive environments where all students feel empowered to take intellectual risks.

CONCLUSION

In conclusion, it can be said that text problems constitute a significant part of the content of the elementary school mathematics course. As a result of solving them, students' mathematical thinking and logical thinking skills are formed and developed.

In text problems, some phenomena, events, processes are expressed in words, and depending on them, problems can be divided into types.

When solving a text problem, first of all, its mathematical model (numerical expression or equation) is constructed and the necessary calculations are performed based on it. In most cases, students have difficulty constructing a mathematical model of a problem. The use of auxiliary models such as pictures, conditional drawings, drawings, and schematic drawings is effective in overcoming this difficulty.

REFERENCES:

1. Abdurahmonova N. Mathematics: a textbook for the 2nd grade of secondary schools. / N. Abdurakhmonova, L. Orinboyeva. - T.: "New Polygraph Service", 2016.
2. Bikbayeva N.U. Mathematics: a textbook for the 4th grade of general secondary schools./ N.U. Bikbayeva, E. Yangabayeva, K. M. Girfanova. Revised and updated 4th edition. — T.: "Teacher", 2017.
3. Burkhanov S. Mathematics: textbook for 3rd grade. / S.Burkhanov, O'.Khudoyorov, Q.Norqulova;— T.: «Sharq», 2016.
4. Mathematics. Collection of problems: textbook for students of higher educational institutions. prof. education. / L.P. Stoylova, Ye.A. Konoboeva, T.A. Konoboeva, I.V. Shadrina. – M.: «Akademiya», 2012.
5. Jaksılıkovna, J. A. (2022). ta'lim jarayonini bulutli xisoblash texnologiyasi asosida tashkil etishning pedagogik omillari. *Gospodarka i Innovacje.*, 23, 77-82.
6. Stoilova L.P. Mathematics: textbook for students. high school education 4-ye izd., ster. - M.: "Academy", 2014.