The Concept of Model and Modeling, Modeling Mathematical Problems

Asimov Alijon
Candidate of Physical and Mathematical Sciences Associate Professor Fergana State University
Abduvaliyeva Muslimakhon
Master degree Fergana State University

Annotation: This article discusses the stages of modeling and modeling in students in the process of teaching mathematics in general secondary schools in today's educational process, methods and techniques for solving problems easily and in "mathematical language". It also describes how to solve problems in elementary school math through modeling, teaching students to think independently.

Keywords: methods of teaching mathematics, model, modeling, scheme, formula.

When observing objects in nature and society and their properties, the first concepts about them are formed. These concepts can be expressed in simple colloquial language, through various pictures, schemes, symbols, formulas. A similar expression is called modeling, and knowing the object being observed using models is called modeling.

The concept of model is derived from the Latin word "modules", which means dimension, norm. A model is a reflection of an object or a system of objects.

A model is a subjective reflection of an objective being or process. It is an object of material or intellectual imagination that can be studied directly and, as a result, new knowledge about them can be formed.

The process of modeling is the creation of a model, its study and application to a particular object. The need to use modeling methods is that the direct study of various objects (problems) is, in some cases, impossible at all. (for example, the future state of the economy, the capacity of society to consume, etc.) Or this research may require additional time and cost. By the nature of the ect, by the degree of description of the models, by the means of modeling, etc.

The method of modeling is divided into the method of material modeling and the method of ideal modeling. The method of material modeling is divided into three groups: spatial, physical and analog modeling. Ideal modeling is also divided into two groups: formalized and non-formalized modeling.

Formal modeling is divided into symbolic and figurative models. Definite modeling includes drawings, graphs, diagrams, formulas, and so on. Mathematical models also belong to this group. Hence, mathematical modeling can reflect economic processes. However, it is not possible to reflect all aspects of the object under study in a single model. Therefore, it reflects the most characteristic aspects of the process. The validity of the model depends on the amount of data collected, the level of accuracy, the skills of the researcher and the nature of the problem identified during the modeling process.

Mathematical modeling refers to the expression of various phenomena and processes in nature and society through mathematical concepts, formulas, equations and inequalities. This means that the course of an event under study has been translated into "mathematical language". The phrase "various phenomena and processes in nature and society" should be understood in a very broad sense. These include: the Earth's rotation around its axis; Rotation around the sun; Gravity of planets: their movement in space (in the sky) on a certain line - in orbit; Moon, solar eclipse, wind blowing; rain, snowfall; Earthquakes; landslides, etc. Also, issues of market economy: distribution of products; population growth; the population's demand for food and clothing, its needs, and so on. All this has been studied and is being studied with the help of mathematics and its methods.

Let's take a look at some very simple, soda cases of mathematical modeling. Mathematical model of the problem - the translation of the problem situation (situation) described in the problem into the language of mathematics is the expression of this situation through formulas, equations and inequalities. In elementary school, problems can be modeled in a variety of ways. Problem-based problem-solving helps students understand the nature of the problem. Mathematical modeling of the problem allows teachers to focus on solving the same type of problem.

The mathematical model of the problem includes the following steps:

1. Identify the unknown to be found in the problem.
2. Make a connection between an unknown quantity and a given quantity. This connection is expressed using equations, inequalities.
3. The magnitudes of the problem, to determine what unknown conditions to be met must be met.
4. Solve the equation in step 2 to determine whether the solution fully reflects the content of the problem, whether it is consistent or not.

The most difficult of the above steps is step 2, which is the most difficult part of building a mathematical model of a problem.

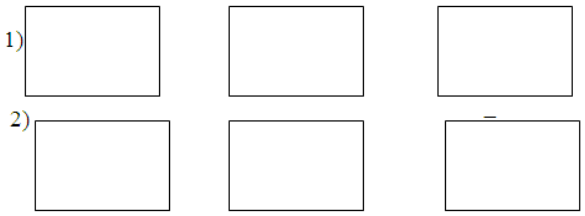
In elementary school, problems can be modeled in a variety of ways. Problem-based problem-solving helps students understand the nature of a problem. Mathematical modeling of the problem allows teachers to focus on solving the same type of problem. As an example, let’s look at a few different problem models.

Issue 1. 60 kg of potatoes and 24 kg less onions were brought to the kitchen. How many onions and potatoes were brought to the kitchen?

Solution: a = 60; b = 24;

Models a + b;

It is necessary for the teacher to know such models. This is because modeling during the lesson makes it easier for the student to explain. The above problem is a simple problem, that is, it is suitable for the first grades. In the first class, we consider it appropriate to use the following models.



In the second grade, they should use the mathematical model in the learning process after the topic. Mathematical models of mathematical models of all problems of the second class correspond to the following forms:

a • b - c; a - b • c;

a: b + c; a - a: c a + b: c

(a + b): c; a: b + b • c

For example, let us fix the mathematical model of the following problem.

Issue 2. 5 apples and 8 apples were placed in 4 vases. How many apples were put in the pots in total?

Mathematical model: a • b + c

To solve the problem a = 4; b = 5; we need to know that.

Issue 3. The first ball has 28 m and the second ball has 14 m more. How many meters of fabric are there in total?

The solution of this problem is solved by the model a + b + a = 2a + b.

Now let's look at motion modeling:

Issue 4. The shop, cinema and school are located on one side of the street. 900 m from the store to the cinema, 200 m from the cinema to school. What is the distance from the store to the school?

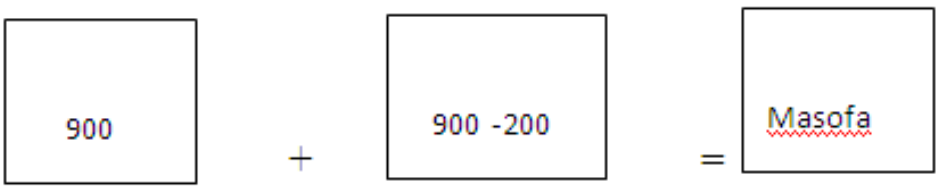
We solve the problem by drawing up various drawings and formulas for the condition.

Solution:

1 – model

Shop school cinema

Model 2



1. How many meters from the cinema to school? 900 - 200 = 700 m
2. What is the distance from the store to school? 900 + 700 = 1600 m

Answer: 1600 m

Model 3: Mathematical model of the problem a + b-c

In short, in elementary school, we can model problems using steps, depending on the context and type of problem. When solving a problem, solving it using different models increases the effectiveness of the lesson. At the same time, the teacher should pay attention to the choice of the appropriate model. If the teacher divides the problems to be solved according to the same model into classes and uses them during the lesson, the students will be able to solve the problem faster and will be more effective. Mathematical modeling of a problem teaches to quickly understand the essence of the problem and solve it independently. It will be the basis for students to master the problem in the future.

References

1. Adxamjonovna, Q. M. (2021). Emphasis on thinking in elementary grade mathematics lessons. ACADEMICIA: An International Multidisciplinary Research Journal, 11(5), 952-954.
2. Asimov, A. (2019). APPLICATION OF MUCH MUTUAL INSTRUCTIONS FOR PREPARING TEACHERS TO TEST DISCIPLINES. *Scientific Bulletinof Namangan State University*, *1*(4), 255-258.
3. Asimov, A. (2019). USING PROBLEMS AND TRAINING STUDENTS TO PROBLEM. *Scientific Bulletin of Namangan State University*, *1*(8), 348-352.
4. Atadjanov, J. M. (2018). Developing Professional Pedagogical Mastery of Future Initial Classes Teachers. *Eastern European Scientific Journal*, (2).
5. Farkhodovich, T. D. (2022). The Problem of Forming Interpersonal Tolerance in Future Teachers. International Journal of Innovative Analyses and Emerging Technology, 2(4), 12-15.
6. Formanov, S. K., & Asimov, A. (1987). A limit theorem for the separable statistic in a random assignment scheme. *Journal of Soviet Mathematics*, *38*(6), 2405-2411.
7. Gofurova, M. A. (2020). РАЗВИТИЕ ПОЗНАВАТЕЛЬНОЙ ДЕЯТЕЛЬНОСТИ УЧАЩИХСЯ ПРИ РЕШЕНИИ ЗАДАЧ. *Theoretical & Applied Science*, (1), 677-681.
8. Han-Woo, C., Khan, V. S., Yilmaz, E., Omelicheva, M., Hyo-Joung, K., Chai-Mun, L., & Chung-Rok, P. (1999). *International Journal of Central Asian Studies*. Institute of Asian culture and development.
9. Ibrokhimovich, F. J., & Mirzaxolmatovna, X. Z. (2022). THE MOST IMPORTANT ROLE OF MATHEMATICS IN PRIMARY SCHOOL. *Galaxy International Interdisciplinary Research Journal*, *10*(3), 652-655.
10. Makhmuda, Q., & Maftuna, K. (2020). Creative tasks in mathematics lessons in primary classes. Proceeding of The ICECRS, 6, 398-400.
11. Mashrabjonovich, O. J. (2019). TECHNOLOGY FOR THE DEVELOPMENT OF PEDAGOGICAL REFLECTION. *European Journal of Research and Reflection in Educational Sciences Vol*, *7*(12).
12. Muxamadaliyeva, M. (2021). USE OF INFORMATION TECHNOLOGIES IN MATHEMATICS LESSONS. Scientific Bulletin of Namangan State University, 3(3), 25-30.
13. Qizi, Dehqonova Mahliyo Shuhrat, and Rayimova Gulchiroy Xatamjon Qizi. "METHODS OF STUDYING ADDITION AND SUBTRACTION OF TWO-DIGIT NUMBERS IN ELEMENTARY SCHOOL." *Gospodarka i Innowacje.* 22 (2022): 61-67.

14. Qizi, M. M. B. (2021). Craftsmanship through mugs of primary school students targeted referral technologies. ACADEMICIA: An International Multidisciplinary Research Journal, 11(9), 246-249.
15. Qizi, Muxamadaliyeva Madinabonu Bohodirjon. "The technology of increasing the effectiveness of mathematics lessons in innovative educational conditions." ACADEMICIA: An International Multidisciplinary Research Journal 11.4 (2021): 1259-1262.
16. Rahmonberdiyevna, T. S., & Soxibovna, A. M. (2021). Techniques for Teaching Elementary Students Rational Numbers and Convenient ways to Perform Operations on Them. *International Journal of Culture and Modernity*, *11*, 283-287.
17. Rakhimovich, F. I., & Ibrokhimovich, F. J. (2022). Methodology of Teaching Arithmetic Practices in Primary School Mathematics. Texas Journal of Multidisciplinary Studies, 7, 5-7.
18. Raxmonberdiyevna, T. S., & Shavkatjonqizi, S. M. (2021). Methods for the development of stochastic competence in mathematics lessons at school. *ACADEMICIA: An International Multidisciplinary Research Journal*, *11*(5), 863-866.
19. S.R.Toshboyeva "Competent approach in teaching probability theory and mathematical statistics" EPRA International Journal of Research and Development (IJRD) November 2020.
20. Sobirjonovich, S. I. (2021). Didactic Interaction as Whole Integral Education. *International Journal of Discoveriesand Innovationsin Applied Sciences*, *1*(7), 80-83.
21. Sobirjonovich, S. I. (2021). Professionalism as a Factor in the Development of the Pedagogical Activity of the Future Teacher. *Journal of Ethicsand Diversityin International Communication*, *1*(7), 76-81.
22. Sobirjonovich, S. I. (2021). Speech Education for Children from 1 to 3 Years of Age. *International Journa lof Innovative Analyses and Emerging Technology*, *1*(7), 135-141.
23. Sobirjonovich, S. I. (2021). Teaching Preschool Children in a Second Language. *International Journal of Cultureand Modernity*, *11*, 406-411.
24. Toshboyeva, S.R. (2020). "Competent approach in teaching probability theory and mathematical statistics" EPRA International Journal of Research and Development (IJRD), November 2020.
25. Toshboyeva, S. R., &Shavkatjonqizi, S. M. (2021). Specific ways to improve mathematical literacy in the process of sending students to hinger education. *ACADEMICIA: An International Multidisciplinary Research Journal*, *11*(10), 234-240.
26. Toshboyeva, S. R., &Turg'unova, N. M. (2021). THE ROLE OF MATHEMATICAL OLYMPIADS IN THE DEVELOPMENT OF INDIVIDUAL CONSCIOUSNESS. *Theoretical & Applied Science*, (4), 247-251.
27. Tukhtasinov, D. (2018). DEVELOPMENT OF LOGICAL THINKING OF PUPILS OF 5-9TH GRADES IN THE LESSONS OF MATHEMATICS. Zbiórartykułównaukowychrecenzowanych., 209.

28. Tukhtasinov, D. F. (2018). Developing Logical Thinking of 5-9th Year Students at Mathematics Lessons. Eastern European Scientific Journal, (2).

29. Zanjabila, Abdurahmonova. "FEATURES OF MOTIVATION TO LEARNING ACTIVITY IN JUNIOR SCHOOL CHILDREN." *Gospodarka i Innowacje*. 22 (2022): 20-24.

30. Асимов, А. & Гафурова, М. (2020). ОБУЧЕНИЕ ДЕТЕЙ ИСПОЛЬЗОВАНИЮ СХЕМЫ В ВИДЕ ОТРЕЗОК ПРИ РЕШЕНИИ ЗАДАЧ. *Мировая наука*, (3), 166-171.

31. Асимов, А. &Солиев, И. (2016). ФОРМИРОВАНИЕ НАБЛЮДАТЕЛЬНОСТИ У УЧЕНИКОВ НАЧАЛЬНЫХ КЛАССОВ. *Ученый XXI века*, 77.

32. Холматова, З. (2016). Основные аспекты развития личностных структур сознания в школьном возрасте. *Вестник современной науки*, (1-2), 132-134.