

**FEATURES OF FORMING UNIVERSAL LEARNING ACTIONS IN TEACHING
MATHEMATICS**

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Mastering universal educational actions by students takes place in the context of different educational subjects. It is quite obvious that there is no strict gradation for the formation of a certain type of universal educational activities (UUD) in the process of studying a particular subject, and cannot be. Therefore, my experience can be used by any teacher in their work. However, the shift of emphasis is possible: when studying some topics, great attention can be paid to the formation of some types of UUD, in others - to the formation of other UUDs. But in general, the content of the mathematics curriculum should be built in such a way that one of the planned results of studying various topics would be the formation of all four types of universal educational activities.

For example, the formation of universal logical actions, i.e. logical literacy of students occurs in all academic subjects, but the study of mathematics allows you to purposefully form logical universal actions. The solution of any mathematical problem requires a clear self-organization: an accurate understanding of the goal, work either according to a ready-made algorithm (plan) or independently created, checking the result of an action (solving a problem), correcting the result if necessary. And these are regulatory UUDs.

It has been proven by pedagogical practice that the effectiveness of training is associated with the motivation of learning. And motivation directly depends on the understanding of the significance of knowledge. For my lessons, I often compose problems using a regional component or use historical information, statistics that are close to children. I use heuristic and non-standard tasks. Such tasks can form all types of UUD at the same time.

Of course, the teacher plays a leading role in the formation of UUD. All of the above forces the teacher to move away from the usual structure of the lesson, from traditional pedagogical technologies. Problem-based learning involves an active "research" activity of the student, he goes through the entire path of knowledge from the beginning to obtaining the result himself (naturally, with the help of a teacher), and therefore each "discovery" of some scientific idea (law, rule, pattern, fact, events, etc.) becomes personally important for him. The student not only acquires new knowledge and skills, but also becomes an initiative, independent, creative person. Problem-based learning is beneficial to use both when learning new material and when "solving" standard and non-standard problems of mathematics.

Project activity is a joint educational, cognitive, creative or play activity of students, which has a common goal, agreed methods, methods of activity, aimed at achieving a common result of the activity. In work we use lessons - projects. These are research laboratory work in groups: "Collection and processing of statistical data", "Methods for solving systems of equations", "Regular polygons in nature, architecture and art", "Practical application of the similarity of triangles", etc. Students are focused on comparing and comparing mathematical objects, the ability to analyze and draw conclusions, make a presentation and defend your project.

These small projects for several lessons, where joint work on the preparation of the project is carried out, is a great opportunity to give each participant a chance to express their creative individuality. Here is how, for example, work on a group project on the topic: "Collection and processing of statistical data" is going on. Students are asked to divide into groups of 3-4 people. Each group receives homework: decide on the topic of the study, formulate the purpose of the study, select questions that will reveal statistical characteristics, conduct a survey and process data, and present information. The design of the work can be done in the form of a brochure or in the form of a newspaper.

In the 2nd year I propose the project "Methods for solving systems of equations." Groups of students are offered systems of equations that need to be solved in various ways: by the substitution method, by the graphical method, by the addition method, by the selection method. Students solve these systems by dividing the work. Make a solution in the form of a presentation (this can be a computer, poster, landscape, etc.) and prepare a defense of your method, indicating the advantages and disadvantages of solving methods for specific systems of equations. Each group nominates its representative and consultant, who make a presentation of their work at the lesson. Other groups take an active part in the discussion and decision, making notes in notebooks, asking additional questions.

The teacher guides the class discussion in the right direction. The technical group (2-3 students) during the lesson collects the entire project and prepares a presentation of the entire project as a whole. We also offer students creative mini-projects for homework. The planned results and forms of their presentation can be: a crossword, a chainword, rebuses, a newspaper, a magazine, etc.

These projects involve the activation of students, because they must get acquainted with educational literature, reference books, select drawings and draw. Students with different backgrounds can participate in project work according to their abilities. After all, a student who has difficulties with mathematics, but has excellent drawing abilities, can compile and colorfully arrange a crossword puzzle, a rebus. And the student's interest and a sense of joy from the completed task is the criterion for successful work.

Use of multimedia aids: media libraries of digital educational resources; tests; Internet resources. These groups of tools can act as a source of knowledge, as well as a

means of developing the skills and abilities of students. ICT in mathematics lessons - various presentations that I make myself or take from the Internet. In addition, students are also periodically invited to make a presentation on a given topic using ICT. Information search in the Internet. Information retrieval allows you to choose from a variety of documents only those that meet a given problem, whether it is a narrow educational task, the topic of the project, questions about preparing for an olympiad or a competition in a subject.

The task of using mathematics lessons to educate and strengthen in students a strong sense of pride in their homeland and love for it has a specific difficulty, the obvious reason for which lies in the abstract nature of mathematical science. However, the use of the technique, which consists in giving a patriotic orientation to a number of historical information, helps to solve this problem as well.

Formation of computing skills; motivation for learning - the development of interest in mathematics, a positive attitude to the process of cognition, the principle of surprise, the formation of personal qualities: accuracy in doing work, thrift. Regulatory actions ensure the organization of their learning activities by students, reflect the ability of the student to build educational and cognitive activity, taking into account all its components (goal, motive, forecast, means, control, evaluation)

Mathematics as a scientific discipline already initially involves goal-setting, planning, forecasting, control, evaluation, algorithmization of actions. Therefore, the formation of regulatory UUD occurs at each lesson.

In lessons we use a set of tasks, the purpose of which is the formation of regulative universal educational actions (control, self-examination and mutual verification of the solution of the problem). As practice shows, exercises for developing the ability to detect errors are paired mutual verification of independent work, verification of student work performed by the teacher without correcting and emphasizing errors. This indicates the task in which the error was made. This work, depending on the level of attentiveness of the student, can be divided into stages: the first indicates the line in which the error was made, the second - a block of lines of the record, the third - only the task.

We will show the organization of work on the example of conducting a mathematical dictation. Answers are written on the board. After writing the dictation, the answers are opened, and each student independently checks his work and evaluates it, according to the criteria proposed by the teacher. (This type of check, first of all, is aimed at developing attention and the ability to adequately evaluate oneself). Students change notebooks and carry out a mutual check, followed by a check by the teacher or followed by a discussion in a pair of mistakes made. (An element of responsibility for the partner appears, attention develops, it becomes necessary to start discussing mistakes, which means entering into a dialogue). Each student independently evaluates his work, not yet knowing the answers, that is, relying on intuition or realistically presenting his

knowledge. After that, a cross-check is carried out. The results are compared and a final grade is given.

However, the answer may seem plausible but not match the data. For example, the own speed of the ship cannot be less than the speed of the river. The mass of goods in the package must be greater than its mass without packaging, the travel time with a stop is longer than the travel time in the same way along the same route, but without a stop. The tax cannot be more than the value. Therefore, students should be taught to consider data and found values in comparison. Also, when solving problems, one should not neglect the “estimation” of the result obtained. All of the above methods are based on the everyday experience of students and find a positive response from them for their ease of implementation.

In addition, we systematically use methods in mathematics lessons: “Find an error”, “Solve in several ways”, “Evaluate the result”, etc. A review of the literature and my own experience in teaching mathematics indicate that in the formation of regulatory UUD it is possible to use such techniques, how: working with a textbook (Internet resources, reference books), drawing up an answer plan in mathematics, organizing homework, doing written work in mathematics, studying the content of a theorem. When working with a book, it is necessary to ensure that the student evaluates the knowledge of the material not because of how many times he has read the text of the textbook, but by the ability to consciously and in detail state the content of what he has read.

In the field of cognitive universal educational activities, students should gain experience in working with information, namely: to carry out an extended search for information using the resources of libraries and the Internet; solve problems with an excess of information (it is required to separate significant information from secondary information); solve problems with a lack of information (it is required to determine what kind of data is missing and where it can be obtained from); use sign-symbolic means for information processing, process mathematical information for its further use; to record and fix information using ICT tools.

Entertaining and non-standard tasks, often used in mathematics lessons, allow students to learn how to independently apply knowledge in a new situation. Communication activities provide opportunities for collaboration. Formation of communicative actions that provide opportunities for students to cooperate: the ability to listen and understand a partner, plan and coordinate joint activities, assign roles, mutually control each other's actions and be able to negotiate (work in pairs, groups). In the process of studying mathematics, acquaintance with the mathematical language is carried out, speech skills are formed: students learn to express judgments using mathematical terms and concepts, formulate questions and answers during the task, prove the correctness or incorrectness of the performed action, substantiate the stages of solving the educational problem. Working in accordance with the instructions for the

tasks of the textbook, students learn to work in pairs, completing the projects given in the textbook in small groups. Formation of regulatory actions - ensures the use of control actions, methods of self-checking and mutual checking of tasks.

The organization of work in mathematics lessons, which are based on interpersonal interaction, dialogue, presupposes the formation of the most important ethical norms. These communication norms are built in accordance with the rules and allow students to learn how to competently and correctly interact with others. Such work develops in children the idea of tolerance, teaches patience in relationships and, at the same time, the ability not to lose one's individuality when communicating, i.e. also contributes to the formation of ideas about the value of the human person.

Mastering UUD leads to the development of content that is significant for the formation of cognitive, moral and aesthetic culture, the preservation of the environment and one's own health, the use of knowledge, skills in everyday life and practice, to anticipate intermediate and final results of one's actions, as well as possible mistakes; start and end the action at the right time; inhibit unnecessary reactions.

At present, in the age of computers and new technologies, in order to achieve results, it is important, first of all, to initiate children's own questions: "What do I need to learn?" and "How can I learn this?". And most importantly, a vocational school should encourage young people to take an active civic stand. It should be noted that the formation of UUD is successfully implemented in the process of teaching mathematics. At the same time, knowledge, skills and abilities are considered as derivatives of the corresponding types of purposeful actions. Mastering universal educational activities leads to the formation of the ability to independently successfully acquire new knowledge, the acquisition of skills and competencies, including the independent organization of the process of mastering knowledge.