

Proceedings of IYSW, (2020), vol. 9, pp 294-306.

Journal homepage: <http://journals.sdu.edu.kz/index.php/iysw>



**International  
Young Scholars'  
Workshop**

## **Organization of extracurricular work in mathematics**

Yessirkeppova Ardak and Yessenbolkyzy Akerke

Suleyman Demirel University, Kazakhstan

**Abstract**

The article explains the technology for organizing extracurricular activities with students in mathematics and the methodology for their implementation, the general characteristics and benefits of different types of extracurricular activities in developing skills in students.

*Keywords:* education, mathematics, activities.

The purpose of modern education, in accordance with the state educational standard, is to educate a competent graduate, i.e. in creating the conditions for the optimal development of abilities for further self-education and improvement. Achieving this goal is possible when mastering special techniques of educational activity, the basis of which is cognitive activity. In this regard, we need such an organization of training in which children are actively involved in work. Much depends on the teacher: how he organizes the work, and what forms, including non-class work, he offers to children.

In this case, it is important for the teacher to take into account the level of preparedness of the class, their interests, individual and age characteristics of each student, the appropriateness of a particular form of extracurricular work. If you take into account all these points, you can put the work so that it is easy to achieve high results.

The reasons for the lack of cognitive activity of students:

- lack of time in the lesson for the development of general skills;
- large number of groups makes it difficult to take into account individual characteristics and learning needs when organizing cognitive activities;
- lack of various forms of extracurricular activities;
- students have little involvement with their own experience or knowledge from other areas
- poor working skills of students with complexly organized pieces of information presented in different forms — textual, graphic, iconic;
- no system has been developed to stimulate students' participation in extracurricular activities.

The created system of extracurricular work in mathematics can largely eliminate these contradictions.

the set and systematically conducted extracurricular work strengthens the mathematical knowledge of students acquired by them in lessons, expands their horizons. In such classes, the student develops informational and communicative competencies.

Practice shows that in order to achieve these goals it is not enough to conduct individual episodic events, a well-thought-out system of all extracurricular work in mathematics is needed . This system should consider:

1. the possibility of using various types of extracurricular activities (circles, olympiads, quizzes, evenings, mathematical printing, mathematical week, extracurricular reading of mathematical literature.);
2. the need for long-term planning of extracurricular activities for the entire period of study
3. The relationship of classroom and extracurricular activities, providing for their targeted influence on each other.

The interconnection of classroom and extracurricular activities can be carried out in two forms: developing and advanced. The developmental form provides for the presentation of program material in the lesson, in which students have a need for a deeper study of this issue in extracurricular activities, and the knowledge gained in extracurricular activities, in turn, will help a more conscious condition for the content of subsequent lessons. In advanced form, the topic is studied first in extracurricular activities, and then in lessons, which allows you to further expand knowledge on this issue in subsequent extracurricular activities.

Extracurricular work in mathematics refers to optional systematic classes of students with a teacher in after-school hours.

It is necessary to distinguish between two types of extracurricular activities math works:

- interesting students in extracurricular activities,
- involving in mass events and individual competitions,
- helping to overcome difficulties, supporting emerging interest in additional self-education classes, the second stage involves
- creating a base for each student for further personal success,

- helping students in awareness of the social, practical and personal significance of extracurricular activities,
- continued formation of positive motivation for participation in extracurricular activities.

The collective and group activities of students are an important condition for the formation of sustainable positive motivation. It is also important that each student feels that he is the subject of the educational process and understands that this process is for him, that the goals and objectives of this process are his personal goals, that he plays an active and important role in it. At the last final stage you need:

- to conduct diagnostics and reflection;
- to compose a rating of students' participation in extracurricular activities
- to summarize and encourage the most active participants

Extracurricular classes in mathematics were conducted by some of the most progressive teachers in pre-revolutionary secondary schools, but not in mass ones, but only in special ones serving the interests of the industrial and commercial bourgeoisie of Tsarist Russia.

Extra-curricular classes in mathematics entered and began to really unfold only after the Great October Socialist Revolution. These classes have acquired special educational significance in our modern secondary school, since in it secondary education should provide strong knowledge of the fundamentals of science, labor and polytechnic training in accordance with the increasing level of development of science and technology, taking into account the abilities and desires of students.

Extracurricular work as one of the means of educating schoolchildren in our country was given serious attention. This is evidenced by at least the following facts. At the very beginning of the existence of Soviet schools, the “Regulations on the secondary labor school of the RSFSR” stated that extra-curricular activities are allocated two days a week, with a special indication that “one day is completely free of extracurricular activities and should be used for cultural and educational events and independent children’s lessons, another day - a half-laborer - was used for club and other extracurricular activities. ”

In 1925 The People's Commissariat for Education again recommends that schools set aside a special day for extracurricular activities.

Since the 60's, extracurricular activities have become an integral part of the school's educational work.

Until now, extracurricular work in mathematics has often been based on the principles of entertainment, a small part of the best students were involved in it. . Under the new conditions, the desire to limit oneself to extracurricular activities in mathematics only with capable schoolchildren cannot be considered appropriate. Now there is a need to include all students in extracurricular work in mathematics. The possibility of mass extra-curricular work is due to the increased interest of students in the school course of mathematics after its restructuring and the creation of new teaching aids, as well as the earlier mental development of children.

Extracurricular work can be considered as a means of developing interest in the subject, improving the quality of knowledge, developing creative independence, aesthetic, moral education of students. Basically, the necessary set of qualities of knowledge directly through the content of knowledge. Tasks should be selected by the teacher, taking into account the mental development of students — go from less complicated to more complex.

Extracurricular math classes can be conducted with the whole class and with individual students. The content of these classes is significantly different from other classes. For extracurricular activities with the whole class, such material is selected that most students can cope with, but it should not duplicate the tasks and exercises that are offered in the lessons, and extracurricular activities with individual students are more complex tasks.

Unobtrusive teacher questions guide the activity of children, their statements. With such an organization of training, various facets of individual education by each student of the same phenomena are revealed. The guys discuss what they heard and saw in these classes. In a collective discussion, the accuracy and accuracy of calculations is checked, the teacher teaches children to express their thoughts accurately, increases the exactingness of their own calculations, and increases interest in mathematics. The emotional and collective life of the class becomes rich and diverse. Children have a need to share everything they see and interesting in the classroom with their comrades, teacher, parents.

The high level of difficulty and the fast pace of studying educational material are the foundations of developing learning, cognitive activity of younger students.

The situation in extracurricular activities, when the teacher provides an opportunity to reflect on the facts, to independently find answers to the questions that have arisen, to defend one's point of view in a dispute with friends, contributes to the development of valuable personal qualities: inquisitiveness, criticality in organizing extracurricular activities, it should be remembered that:

- extracurricular activities should not exceed 30–45 minutes;
- activities should be emotionally attractive, with great visual material and include elements of ethics and aesthetics;
- activities should be based on bright, vibrant, interesting, accessible material for primary school children;
- participation of students in these classes should be supported and encouraged;
- alternate the state of rest and movement in children in the classroom;
- organize classes so that the student is involved in the process of independently searching and “discovering” new knowledge;
- classes should be varied, conducted so that the children understand the need, importance, and appropriateness of studying this material;
- The material should be affordable, but difficult, vibrant, emotional, colorful.

Extracurricular activities bring great benefit to the teacher himself. An old Latin proverb says: “Teaching others, we learn ourselves.” Extra-curricular activities are carried out in various forms of education:

- extra-curricular activities;
- math matinee;
- math class;
- math newspaper;
- contests, competitions,

- protection of projects.

Already at 5 the class needs to organize interesting and extra-curricular work on the subject.

The most accessible and popular form of work outside the lesson is the organization of the circle.

Usually, group classes are organized for well-performing students. However, it should be borne in mind that sometimes poorly performing students express a desire to participate in the work of the mathematical circle and often very successfully study there; a math teacher should not be prevented from doing this. You just need to be more attentive to such students, try to strengthen their germs of interest in mathematics, make sure that work in the math class turns out to be feasible for them.

In the first lesson of the circle, you need to outline the main content of the work, choose the elder of the circle, and agree with the students about the rights and obligations of a member of the circle, draw up a work plan and distribute instructions for certain activities.

It is advisable to conduct the classes of the circle once a week, allocating one hour for each lesson. Students should be involved in organizing the work of the mathematical circle. In the math class, the teacher must create an “atmosphere” of free exchange of views and active discussion. The subjects of math classes in the modern school are very diverse. Questions related to the history of mathematics, the life and activities of Russian and foreign well-known mathematicians find their place in the topic of study classes for grades 5-11.

It is more important to practice different methods of solving the problem, not to enforce your solution. It is better to solve one problem in two or three ways than three tasks in one way.

At the same time, it is necessary to ensure that the topic of the classroom activities is diverse. The pace of conducting circle classes should gradually increase. The value of the content of extracurricular activities is determined by the variety topics and methods for solving problems, novelty in relation to the content of the mathematics lesson in the classroom. Schoolchildren must be taught to navigate in unfamiliar situations and areas, to solve the problem of an unfamiliar plot, with unusual mathematical content for them.

In the work of the mathematical circle of great importance is the amusement of the material and the systematic nature of its presentation. Entertaining increases interest in the subject and contributes to the understanding of an important idea: mathematics surrounds us, it is



everywhere. A systematic presentation of the material can be aimed at the general mental development of students.

So that the work of the math group for students in grades 5-6 is interesting, it is necessary:

- systematic work;
- familiarization of students with reading additional literature on the subject;
- organization of the competition in the circle classes;
- the preparation by students of various forms of benefits;
- opinion the use of various game forms of work that arouse the interest of children.

Based on the foregoing, classes in the mathematical circle should be carried out using game elements or in general all classes in a game form.

Indicative plan of extracurricular activities of the mathematical circle in grades 5–6

1. The history of mathematics. (6 hours.)
  - a) Old Russian, metric and other measures.
  - b) Calculating devices. Computing technique.
  - c) How people learned how to calculate time.
2. Patterns of the world. (16 hours)
  - a) Mathematical induction. Deduction and induction. Complete and incomplete induction.

Method of mathematical induction

- b) Combinatorics. 2 rules of combinatorics. Pascal's Triangle. Newton's binom.
  - c) Probability theory. Random events. Unambiguous and ambiguous outcomes.
  - d) Statistics. Statistical regularity.
3. Mathematics in the service of man (8 hours)
    - a) Mathematics in agriculture
    - b) Mathematics in everyday life
    - c) Mathematics in nature
  4. Math games. (4 hours.)

Games and game forms of classes in extracurricular work in mathematics.

The formation of a student's personality occurs in various types of activities: educational, labor, social, and gaming. Each of them has its own characteristics and capabilities, and at different stages of training, it is different for different ages.

Types of activity must be considered in the relationship, interdependence and complementarity. This is also true for gaming activities, especially when it comes to raising and educating children for whom gaming activity is also a need.

Using the needs of children for the game gives rise to a special kind of games - didactic games and a special form of classes - a game form. Under didactic game means a game used for training and education. Under the game lesson is understood lesson penetrated by the elements of the game or containing a game situation.

A game activity may include one or more related didactic games. Didactic games and game classes designed taking into account the characteristics of teenage games, the characteristics of the subject and specific conditions are emotional, they cause mental stress in schoolchildren and exacerbate intellectual processes.

#### Mathematical matinee.

Of all types of extracurricular activities, great importance in creating interest in the subject and in the rational organization of children's leisure have math mornings. In the process of preparing for the evening, it is necessary to provide maximum opportunities for students' independence, for the manifestation of their independence and initiative.

In recent years, this form of mathematical evenings, extracurricular activities, KVM (Club of Cheerful Mathematicians) is widely used.

All participants are divided into teams, captains and juries are chosen. The evening begins with the fact that the host announces today is an unusual evening. It will define the classes that know the math better and which of the guys is the smartest. The evening is held in the form of competitions.

#### Mathematical competition.

One of the entertaining and at the same time useful forms of extracurricular work in mathematics is the participation of children in mathematical contests. The organization and conduct of mathematical competitions is almost the same with the first round of the Olympiad.

Everyone can take part in competitions. In preparation for the competition, the teacher selects a number of tasks from the sections completed. By their nature and content, these tasks should slightly differ from the usual tasks of the textbook, since the competition does not serve to control knowledge, but to identify mathematical abilities and increase interest in mathematics.

When preparing for the competition, the teacher informs the children in advance about the time of the competition and the nature of the tasks, which will be offered at it, carries out appropriate work to explain the goals and objectives of the competition, so that children show interest and desire to participate in the competition.

Some classes of the mathematical circle can be carried out in the form of a quiz - a competition of experts. Such competitions are interesting and useful. They are conducted in an experimental situation with a limited time. Children seek to justify the trust of comrades by mobilizing internal forces, ingenuity, and quick wit. A child's willingness to act in experimental situations is formed, resourcefulness and quick reaction develops.

#### Mathematical corner (newspaper).

As a result of extracurricular and classroom work in mathematics, it becomes necessary to concentrate visual material, wall newspapers, measuring and other instruments and devices in a certain place in the classroom. For this purpose, a mathematical corner can be organized. The mathematical corner is organized and formalized with the active participation of children, the work of students in the corner is diverse:

- A compilation of interesting mathematical information on the names "Do you know ..." is compiled. It accumulates data that children can read in newspapers, children's books, etc.
- In the corner, colorful posters are posted with messages about quizzes, olympiads, student work, etc.
- Exhibitions of the best student notebooks are periodically organized in the corner, visual aids made by students.
- Various tools, materials, and separate visual aids for extracurricular activities are stored and, if necessary, given out in the mathematical corner.

A place is allocated for the mathematical newspaper in the mathematical corner. A mathematical newspaper, with its reasonable organization, helps to increase children's interest in mathematics, it serves as an agitator and organizer of mathematical circles, quizzes, and contests. Drawings and photographs should occupy a large place in a mathematical newspaper. The guys like it when the newspaper covers the material they have collected, and when the newspaper themselves issue it. Therefore, in the design, children need help with advice and correct at the right moments.

Theoretical examples of several mathematical extracurricular activities are given. Extracurricular work in mathematics forms and develops the abilities and personality of the child. To manage this process means not only to develop and improve the inherent abilities in human by nature, but also to form new skills and instill the need for constant self-development and self-realization. In mathematics there are many opportunities to interest students in the content of this science. At the same time, the main purpose of the classes is to teach a certain set of procedures of a mathematical nature, the amusement of the presentation is subordinate to this goal, the development of students' abilities takes place as part of the study of the required material. Extracurricular activities are understood to be optional, systematic classes with students outside school hours. Thus, the student begins to perceive mathematics on the other hand and view from a different angle.

### **References**

Gorev, P.M. Formation of creative activity of schoolchildren in additional mathematical education: Author. dis. ... cand. ped sciences. –Kirov, 2006. –19 p.

Gorev, P.M. Formation of the creative activity of schoolchildren in additional mathematical education: Dis. ... cand. ped sciences. –Kirov, 2006. –158 p.

Gorev, P. Introduction of schoolchildren to creative learning activities in extracurricular classes in mathematics // Bulletin of the University of Pomerania. Series "Physiological and psychological-pedagogical sciences." 2006. –No5. –P.160–163.

Gorev, P.M., Utemov V. V. Twenty ingenious problems of the Owllet: A Training Manual. – Kirov: Publishing House of the Moscow Institute of Science and Technology, 2015. –30 p.