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INTERACTIVE METHODS IN A SCHOOL COURSE OF MATHEMATICS

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The modern learning system requires a teacher to cover a large amount of information and is focused on the levels of “knowledge” and “understanding”. This pushes the teacher to use mainly passive teaching methods. In previous years, the use of passive teaching methods was justified. The teacher could pass the entire amount of known information on any subject to his student.In the modern world, the situation has changed dramatically. It is impossible for one person to know everything even in some narrow area of knowledge. In addition, as you know, numerous facts well remember computers. Students should have completely different skills and abilities: to think, to understand the essence of things, to comprehend ideas and concepts and already on their basis to be able to search for the necessary information, interpret it and apply it in specific conditions. Interactive methods that are not something new, but are not widely used in the real educational process, and sometimes even fall out of the teacher’s arsenal, contribute to solving this problem. The use of certain methods depends on various reasons: the purpose of the lesson, the experience of

the participants and the teacher, their taste. It is very difficult to classify interactive methods, since many of them are a complex interweaving of several techniques: however, the main interactive approaches can be called.These are creative tasks, work in small groups, educational games, the use of public resources, social projects and other extracurricular teaching methods. I will dwell on educational games, which, along with creative tasks and work in small groups, are the main method of interactive classes. Conventionally, I will highlight several types of learning games:

- role-playing and imitation,
- business games and modeling,
- educational games.

At the beginning of a lesson in mathematics, it is recommended to warm up as an oral account, which is intended to attract or concentrate the attention of students to the topic of the lesson, and if this is in the middle of the lesson, then give them a discharge. Warm-up can be any interesting exercise or game. I will give examples. Tasks for the oral account are written on the blackboard, for each task the answer options (one correct). Each answer is signed by some action, for example: “clap your hands”, “hold your nose”, “close your eyes”, “sit down at the table”, “cross your arms on your chest”, shout “ku-ka-re- ku! " etc.The children decide the task, find the correct answer and perform the action. Tasks-actions can be replaced by funny figures that show these actions: the person with his hands up, the person crouched beside a desk, the person stands on one leg, etc. Such an interactive oral account serves as a good motivation for learning a new topic, demonstrates the importance of attentiveness and joint action. The interactive method "everyone teaches everyone" is used in the lesson when studying a new material or when generalizing basic concepts and ideas. Teaching each other is one of the most effective ways to learn information on a subject and put into practice important skills and abilities to explain difficult material, ask questions, listen, communicate, etc. Children will also be able to review the general picture of concepts and facts with the help of their comrades It is necessary to study during the lesson, which, in turn, will raise questions and increase interest.

This article also discusses the online program Kahoot, interactive learning methods - the impact of interactive learning on the learning process in high and secondary schools. In addition, the article provides a step-by-step algorithm for teachers to correctly use the online program, and effectively use them while working in the classroom.

Modern technologies can significantly complement traditional methods and provide a more complete immersion in the subject of study. Studies show The Brain May Use Only 20 **%** of Its Memory-Forming Neurons that we remember only **20%** of what we hear, **30%** of what we see, and up to **90%** of what we do or experience during a simulation. Virtual reality allows you to get a real experience of presence, increasing the effectiveness of learning and the likelihood of remembering.

In the Message of the First President of the Republic of Kazakhstan N.Nazarbayev to the people of Kazakhstan dated January 10, 2018, “New Opportunities for Development under the Fourth Industrial Revolution”, one of the most important priorities is accelerated technological modernization of the economy: Today the world is entering the era of the Fourth Industrial Revolution, the era of profound and rapid changes : technological, economic and social. A new technological pattern radically changes the way we work, we exercise our civil rights, we bring up children. In 2018, it is necessary to begin the development of the third five-year plan of industrialization, dedicated to the emergence of the digital age industry. It is necessary to develop in the country such promising industries as 3D printing, online trading, mobile banking, digital services, including in health care and education ... " [1].

Indeed, the use of modern Web technologies in education allows us to “refresh” the traditional lesson, give it new “colors”, increase the level of students' motivation for the subject and, as a result, improve the quality of education. In an attempt to find new forms and methods of training, the teacher has to experiment, synthesize different approaches and modern ICT tools. The result of this work may be a synthesis of collaborative learning and the Web 2.0 service Kahoot.

Collaborative training is an approach in which training is built on close interaction between students, or between students and the teacher. Participants in the process gain knowledge through an

active joint search for information, discussion and understanding of meanings. Collaborative learning includes formats such as group projects, collaborative development, etc. Recently, collaborative learning has received a new interpretation in the context of e-learning (computer-supported collaborative learning). In this sense, collaborative learning is the use of Web 2.0 services (blogs, social networks, collaborative applications, virtual classes, communities of practice, etc.) for learning purposes. [2].

Kahoot is a client-server educational web-platform (in English), which allows you to conduct absolutely free testing, surveys and discussions in the mode of collaborative learning.
Who and what is behind Kahoot !? Kahoot platform and brand was developed by a founding team led by Johan Brand, Jamie Brooker, Asmund Furuseth and Morten Versvik. The technology platform itself is based on a study conducted by Morten Versvik for a master's degree from the Norwegian University of Science and Technology (NTNU)and based on research conducted by Prof. Alf Inge Van and his colleagues at NTNU [3].

The basis of the service Kahoot! There are five main and one supporting sites:

1) **create.kahoot.it** –a website that is intended to be created by the user (teacher) kahoots.
2) **play.kahoot.it** – a website that serves to launch kahoots by the user (teacher).
3) **kahoot.it** –a website that serves to connect users (students) to kahoots through various devices (laptops, tablets, smartphones).
4) **test.kahoot.it** –a website that allows you to test your Internet connection and identify its level of quality to work with the Kahoot service!
5) **media.kahoot.it** –a website for working with media content service.
6) **getkahoot.com** – support website designed to support users.

Now I want to use Kahoot in the explanation of trigonometric Functionsof the angle and their properties. Because Kahoot helps for children to remember right answers quickly and correctly.

Lesson plan on algebra in 9 "A" class.

Title: "Trigonometric functions of the angle and their properties."

Aim: 1) To determine, using a trigonometric circle, sine, cosine, tangent and cotangent of any angle.

2) To form an idea of the signs of trigonometric functions in the coordinate quarters and to teach children to identify the signs of trigonometric functions and their products.

3) To promote the development of mathematical thinking.

4) To cultivate personal qualities: cognitive activity, independence, perseverance in achieving the goal. Encourage students to self-monitor their activities [4].

Equipment: Multimedia projector, "Open lesson" presentation program, made in Power Point , compasses, ruler, board, online program Kahoot!.

During the classes:

- **Dating: (Get acquainted with the class, introduce yourself: name, name of the institution where I work);**
- **Checking homework (with Kahoot!):**

1. Fistful the teacher sign up in Kahoot! (Figure 1). After that she creates a Kahoot (one of four types) on the site **create.kahoot.it**(Figure 2)

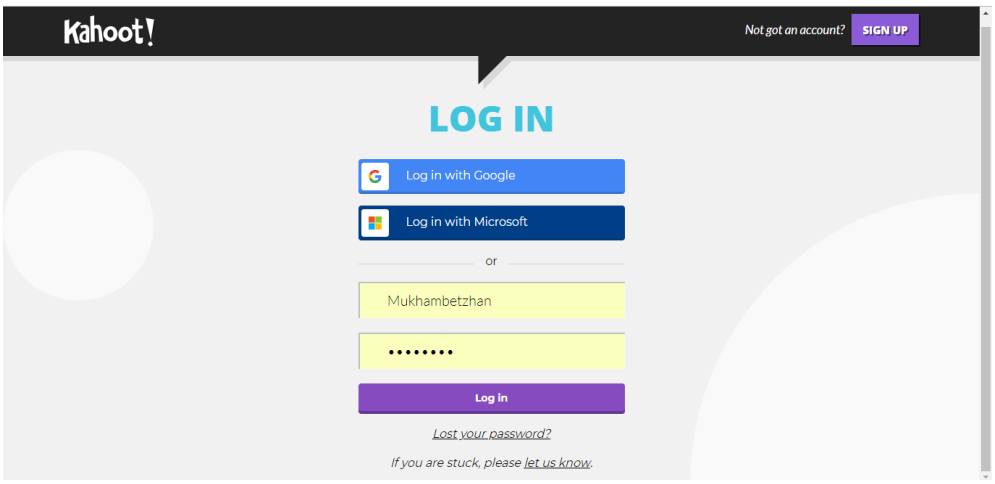

Figure 1

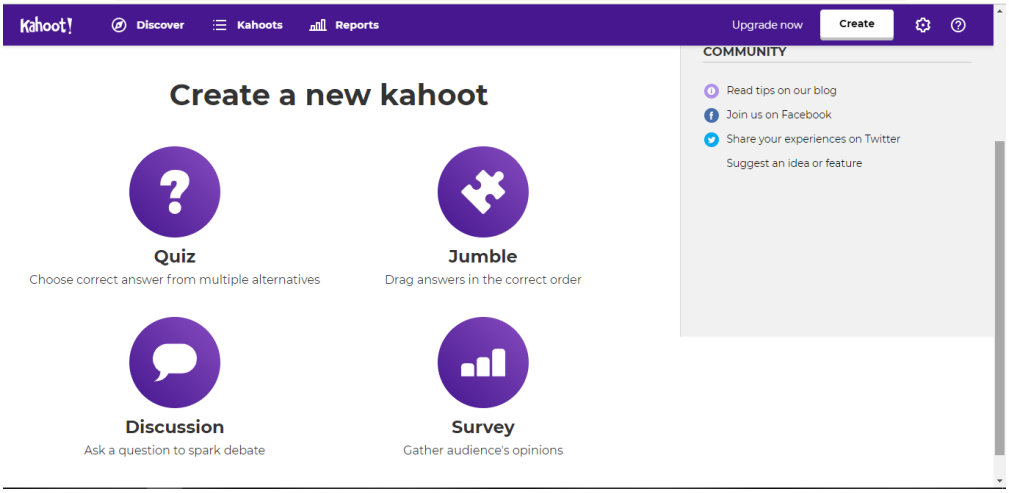

Figure 2

2. The teacher launches (there is an automatic redirect (redirection) from create.kahoot.it to play.kahoot.it) created by Kahoot, for example, a test, on a computer with an interactive whiteboard in the classroom and waiting for students to connect (Figure3)

3. Students open the kahoot.it website on their smartphones or laptops and enter the game code (game pin), which they see on the teacher's screen, thereby being included in the overall collaborative network (Figure3)

Figure 3

4. After the required number of students have successfully connected to the Kahoot, the teacher

starts the Kahoot by clicking on the “Start” button, the students see the questions, answer options and answer them using their gadgets(Figure 4)

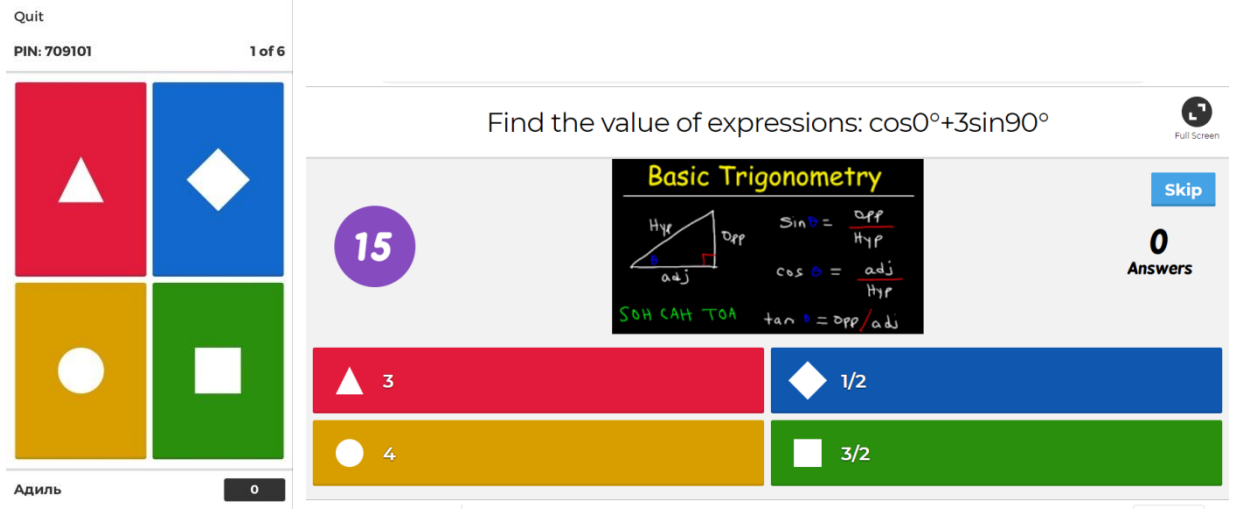

Figure 4

And other problems you can see here https://create.kahoot.it/details/73dc7a48-dcc1-4abc-bcf4-327e42509b70.

5. When all the test tasks are solved, the students see their results on the interactive whiteboard. At this stage, the teacher can conduct reflection. Students are asked to rate the test on a 5-point scale, express their emotions / feelings, assess the test's compliance with the topics / materials studied, and decide on the recommendation of this test to their peers (Figure 5).

6. Next, the teacher has the opportunity to save all the results of students by exporting to Excel-document and saving it to your computer or Google Disk(Figure 5).

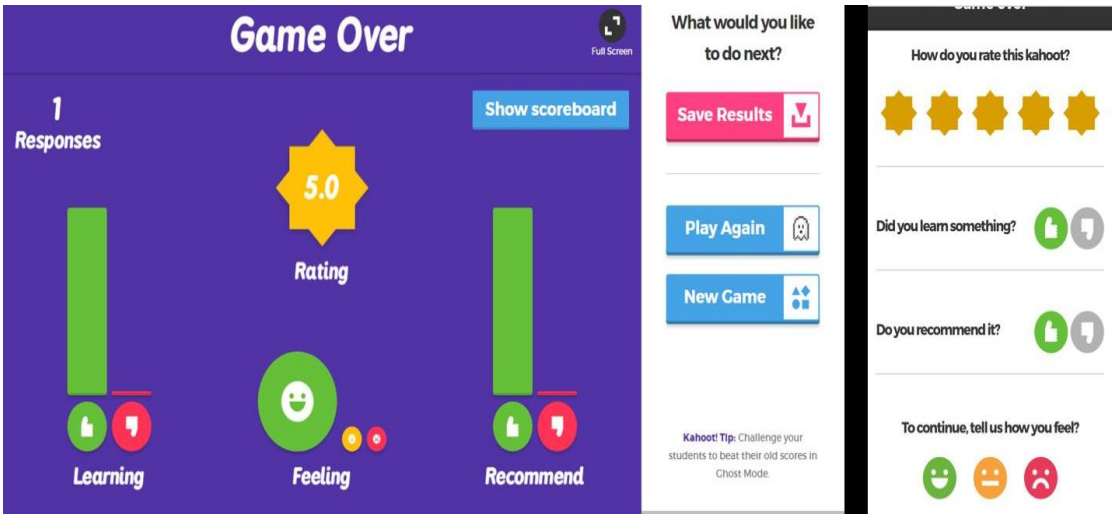

Figure 5

- Organizing time. * Determine the topic of the lesson, set goals:
  1) Determine the sine, cosine, tangent and cotangent using the trigonometric circle and the signs of these functions in quarters;
  2) To teach to determine the signs of the functions of any angle and the products of the functions of any angle.
- History of trigonometry. Early study of triangles can be traced to the 2nd millennium BC, in Egyptian mathematics (Rhind Mathematical Papyrus) and Babylonian mathematics. Systematic study of trigonometric functions began in Hellenistic mathematics, reaching India as part of Hellenistic astronomy. In Indian astronomy, the study of trigonometric functions flourished in the Gupta period, especially due to Aryabhata (sixth century CE). During the Middle Ages, the study of trigonometry continued in Islamic mathematics, hence

it was adopted as a separate subject in the Latin West beginning in the Renaissance with Regiomontanus. The development of modern trigonometry shifted during the western Age of Enlightenment, beginning with 17th-century mathematics (Isaac Newton and James Stirling) and reaching its modern form with Leonhard Euler (1748) [5].

- Actualization of knowledge. * At the last lesson you studied the turn, so we will repeat the material a bit, having worked orally:
    a. What is the sine of an acute angle in a right triangle?
    b. What is the cosine of an acute angle in a right triangle?
- Definitions trigonometric functions.
  Consider an example of a task. Determine the sign of the trigonometric expression $sin285° * cos35°$
  Problems to solving in classroom: №722, 723.
- Summing up the lesson. Mark the extent to which the objectives of the lesson are achieved, evaluate the students' work in the lesson, give an explanation of the homework assignment.
- Homeworks: №725, №730.

Interactive teaching methods require a certain change in the life of the class, as well as a lot of time to prepare both from the student and from the teacher. Start with the gradual use of these methods. Both the teacher and students need to get used to them and get some experience using them. It is better to carefully prepare several interactive classes in the school year than to often hastily prepared “games”. Using interactive methods is not an end in itself. This is only a means to achieve the atmosphere in the class that best contributes to the understanding of the spirit of law and civil society as a spirit of cooperation, mutual understanding, goodwill.

When students perform interactive tasks, the perception and memorization of information increases, the memory performance increases, such intellectual and emotional characteristics of a person develop as more intensively, such as: sustainability of attention, ability to distribute it; ability to analyze, classify. The students are happy to work with the Kahoot! Service, they perform almost all the tasks, and they achieve their full implementation. When discussing the difficulties of performing tasks, students analyze and evaluate the level of their knowledge.Such behavior and increased motivation to learn students gives teachers feedback that Kahoot! indeed, it is a tool of formative assessment, supports the process of learning, develops pupils' cognitive processes. In conclusion, it should be noted that such an introduction of modern technologies into the educational process is objectively effective. Skillful use of such Web 2.0 in pedagogical activity is, albeit a small, but tangible for the educational community, a step towards the implementation of the Digital Kazakhstan program.

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2. Collaborative training // http://www.trainings.ru/library/dictionary/kollaborativnoe(sovmestnoe)obuc/
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