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D. I. Yunusova
Tashkent State Pedagogical University
Professor, Ph.D.
dilfuzaisrailovna@gmail.com

G.A. Sharipova
school number 156
teacher, Tashkent, Yashnabad district
gulnorasharipova51@gmail.com

METHODS OF ORGANIZING A MATHEMATICAL EVENT DEDICATED TO THE LIFE AND WORK OF THE GREAT SCHOLAR AL-KHWARIZMI

Abstract: This article discusses the methods of developing national and intercultural competencies in students through mathematical events dedicated to the life and work of Al-Khwarizmi
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Introduction

Nowadays, the invaluable knowledge and discoveries created by the intellect and artistic genius of our great scientists, writers and scholars, who grew up in our ancient and unique country, serve humanity invaluably [1].

To prove that recalling the science of "algebra" and the "algorithm" founded by the great encyclopedist Muhammad Khorezmi can be enough. The great foundings of our ancestor are still appreciated by all humanity. His universal discoveries are a solid foundation for today's information technology.

A statue of our great-grandfather was erected yesterday at the University of Complutense in Madrid, Spain. With a history of 500 years, this prestigious university is one of the leading ones in the country. Such a great respect for the memory of our great ancestor is a symbol of high respect for our people for its ancient history and rich scientific heritage. To this end, one of the most important tasks of today's educators is to teach and widely promote the creative heritage of our world-renowned scholars in extracurricular activities in mathematics.

The most common type of extracurricular activity from math is math events. Mathematical events dedicated to the life and work of our great scientists teach students to be loyal to the motherland, to be kind to people, to appreciate the national, spiritual and cultural heritage, to believe in national values, and develop general cultural competencies. At the same time, it will play an important role in educating young people who are proud of their past and can look to the future with hope and confidence.

Many scholars have conducted research on the methodology of conducting math events as extracurricular activities from math. In particular, M. Mamadaliyeva [3] in her scientific research showes the value of the method which uses the life and work of mathematicians, poems, songs and interesting puzzles in the organization of mathematical events. On the other hand, A.L. Mirzamurodova [4] in her research recommends to use fairy tales and riddles which tell the history of the origin of mathematics in the organization of mathematical evenings, while researcher Z.V.Viktorova [5] suggests the method of

using mathematical labyrinths, logical problems and examples in the organization of such events.

Our research focuses on the problem of developing national and intercultural competencies in students through mathematical events dedicated to the life and work of Al-Khwarizmi.

Below we present a scenario of a mathematical event "From Algebra to the computer" dedicated to the life and work of the great scholar Al-Khwarizmi, which we organized with the students of 5th grade.

The event hall is decorated with pictures and sayings of our great scholar Al-Khwarizmi, as well as various flowers and balloons. Two presenters come on to stage under the sound of music.

Presenter 1: Good morning, dear guests - esteemed teachers and diligent students, welcome to our event.

Presenter 2: Nice to meet you again!

Presenter 1: Today's Mathematical Event is called "From Algebra to the Computer" and is dedicated to the work of our great mathematician, astronomer and geographer Abu Abdullah Muhammad ibn Musa al-Khwarizmi.

Presenter 2: Our scientist Al-Khwarizmi, the founder of the science of algebra and the theory of algorithms, is recognized by the whole world as the founder of the number system, which represents nine numbers with zero sign, representing the decimal positional calculation [6].

Presenter 1: The concept of algorithm created by our ancestor today serves as the foundation of modern digital system and computer technology all over the world.

Presenter 2: In order to teach and promote the life and work of our great scientist, we organized today's Math event as a competition.

Presenter 1: In today's competition, the "Aljabr" group of 5-A students and the "Algorithm" group of 5-B students will compete. Each group consists of 5 students who is going to test their mathematical knowledge and ability under the following rounds.

Presenter 2: Round 1 is called "History of Al-Khwarizmi", in which we test how well the members of the group know the life and work of our ancestor Al-Khwarizmi.

Presenter 1: Round 2 is called "Math Puzzles" and it tests the ability of our team members to respond quickly and accurately to math puzzles.

Presenter 2: Round 3 is called "Natural Mathematics," in which we test the ability of group members how they apply their knowledge of mathematics in everyday life.

Presenter 1: Round 4 is called the "Leaders' Competition," in which we find out how knowledgeable and smart the group leaders are.

Presenter 2: Now, dear spectators, before we start today's competition, let's give the turn to the students of 5-B class of our school and watch a wonderful "Khorezm" dance performed by them.

(Grade 5B students come out and dance)

Round I

Presenter 1: Dear spectators, we will start our 1st round by giving the turn to the participants of our competition. This round is called "History of Al-Khwarizmi", in which members of the group are asked questions about the life and work of our ancestor Al-Khwarizmi. We invite group leaders to the stage to start our round. *(The group leaders come out to the stage.)*

Presenter 2: Dear Group Leaders, the envelopes in my hand contain questions about the life and work of our ancestor Al-Khwarizmi. You will need to select one of these envelopes and answer the written questions with your team members. There are five questions in total in each envelope, and you get 5 points for each correct answer and 0 points for each incorrect answer. *(The group leaders choose one of the envelopes provided by the facilitators. The questions in these envelopes are read out to the group members by the facilitators.)*

Presenter 1: To do this task, we need to invite the group members of "Algebra" to the stage. Dear group members, please listen to our questions carefully and answer them.

1. When and where was our ancestor Al-Khwarizmi born?
(Answer: Al-Khwarizmi was born in Khiva in 783)

2. In which work of Al-Khwarizmi were the decimal positional system and the zero sign, the statement of nine numbers discussed?
(Answer: Al-Khwarizmi's Fi Hisab al-Hind discusses the decimal positional system and the zero sign, the nine-digit statement.)

3. Which work of Al-Khwarizmi is the term "algebra" derived from?
(The term "algebra" is derived from the Latin spelling of the word "algebra" in Al-Khwarizmi's "Al-kitab al-mukhtasar fi hisab al-jabr wa al-muqabala".)

4. What is the largest astronomical work of our ancestor Al-Khwarizmi and how many chapters and how many tables does it consist of?
(Answer: Al-Khwarizmi's largest astronomical work is called Zij. It consists of 37 chapters and 116 tables which discusses the mathematical geography, 5 planets, the Sun and Moon, as well as eclipse of The Sun and The Moon and Trigonometrics.)

5.How did the famous English mathematical historian G. Sarton describe Al-Khwarizmi in his works?
(The famous English mathematical historian G. Sarton described Khorezmi as "the greatest mathematician of his time and, if all aspects taken into account, one of the greatest mathematicians of all time" [6].)

Presenter 1: To accomplish our first round, we need to invite the "Algorithm" group members to the stage. Dear group members, please listen carefully and

answer our questions.

1.How many parts does al-Khwarizmi's treatise on algebra consist of, and what thoughts did he write about this work?

(Al-Khwarizmi's treatise on algebra consists of three parts: the algebraic part, the geometric part, and the testament. Al-Khwarizmi wrote the following about this treatise: "... I have studied the simple and complex problems of arithmetics. I have proposed a "Short Book on Algebra and Al-Muqabala Accounts," which includes the division of inheritance, the making of wills, the distribution of goods and justice, trade and all kinds of transactions, land surveying, canal construction, geometry, and so on. It is necessary for people to do different things".)

2. Today, in which library is the original manuscript of the algebraic treatise of our ancestor Al-Khwarizmi "Al-kitab al-mukhtasar fi hisab al-jabr and al-muqabala"?

(The original manuscript of the algebraic treatise written by our ancestor Al-Khwarizmi is now kept in Kabul, Madinah, and the Bodleian Library at Oxford University.)

3. What is the name of the geographical work of our ancestor Al-Khwarizmi?

(Al-Khwarizmi's work on geography is called "Kitab surat ul-arz".)

4. In which of his works does al-Khwarizmi introduce the concepts of tangent and cotangent and give the corresponding tables?

(The concepts of tangent and cotangent and their corresponding tables are given in Al-Khwarizmi's Zij.)

5. How does the treatise on geography of our ancestor Al-Khwarizmi differ from the geographical works of the Greek scientist Ptolemy?

(Al-Khwarizmi, in his treatise on geography, divides the inhabited part of the earth into seven climates. [7].)

(Scores for round 1 will be announced by the judges.)

Round II

Presenter 2: Now it's turn to start second part of our event. This part is called Math Puzzles, and it tests the ability of our team members to answer logic questions quickly and accurately.

Presenter 1: Dear team members, in this part you will be given the following math puzzles:

(The story is projected onto a screen, shown to everyone, and read out by the facilitator.)

1. The plane flies from city A to city B in 1 hour and 20 minutes. But it takes 80 minutes to get back. How can it be exolained [page 8.145]?

2. How many edges are there in a six-sided pen [8. 124 bet]?

3. The adult and the child are both standing in the bitter cold, their clothes are the same. Which one gets cold most [page 8.127]?

4. What is the largest number you can write with four ones - 1,1,1,1 [8. Page 146]?

5. Think in your brain what is the length of the strip formed by stacking all the square millimeters in a square meter side by side [8. 147 bet]?

Presenter 2: As you can see, our task consists of five questions. In this case, the group members get 5 points for each correct answer and 0 points for each incorrect answer.

Presenter 1: Groups are given 5 minutes to complete this. You can start.

(Answers to the above questions will be written by the team members and submitted to the jury for review. The following answers to the questions will be accepted by the jury as correct:

1) Because the plane goes in both directions at the same time

80 minutes = 1 hour equals 20 minutes.

2) Its sides (if the ends are not open) are 8: six at the sides and two small ones at the two ends.

3) The child eats more cold.

4) The eleventh degree of eleven.

5) The length of the strip is 1 km.)

Presenter 2: We give the floor to the judges to announce the scores of our teams from round II.

(Scores for round II will be announced by the judges.)

Round III

Presenter 1: We give the turn to our round III. This round is called "Natural Mathematics" and it tests the ability of the group members to apply their knowledge of mathematics in everyday life.

Presenter 2: Dear viewers, we are giving the group members the following Pisa tests through handouts called "Climbing Mountain Fuji" which you are currently seeing on the screen:

(PISA tests are projected onto a screen, to show everyone, and read out by a presenter.)

Climbing Mount Fuji

Mountain Fuji is a popular pilgrim destination in Japan.

Figure 1

Q1: Only from July 1 to August 27 it is allowed to climb Mount Fuji every year. During this time, about 200,000 people climbe Mount Fuji.

On average, how many people climb Mount Fuji every day?

A. 340
B. 710
C. 3400
D. 7100
E. 7400

Q2: The total length of the Gotemba trail that leads to Mount Fuji is about 9 kilometers. Travellers will have to return at 20:00 after travelling 18 km. Tashpolat estimated that he would climb the mountain at an average speed of 1.5 km per hour and descend the mountain with twice more speed. He also planned to have time to eat and rest. Using the climbing and descending speeds of the rock, calculate when he should start its long journey to return at 20:00.

Q3: Tashpolat took a step counter with him before climbing the Gotemba trail. He showed that the step counter had taken 22,500 steps before he went upstairs. Determine the average step length of the stone as he climbs the 9-kilometer Gotemba trail. Express your answer in centimeters [9].

Answer: .... sm

Presenter 1: As you can see, our round consists of three questions. In this case, the group members get 5 points for each correct answer and 0 points for each incorrect answer.

Presenter 2: The groups are given 10 minutes to complete this task. You can start.

(Answers to the above questions will be written by the team members and submitted to the jury for checking. The following answers will be accepted by the jury when the following answers are given to the PISA test:
1) 3400   2) 11 hours   3) 40   )

Presenter 1: We give the floor to the judges to announce the scores of our teams for this task.

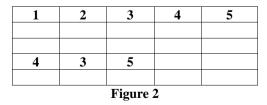*(Scores for round III will be announced by the judges.)*

Round IV

Starter 1: Dear viewers, we turn to the round IV of today's competition. In this part, the team leaders compete with each other. We invite group leaders to the stage.

(The group leaders come out to the stage.)

Presenter 2: Dear Group Leaders, in this part, you are given the following question:

(The story is projected onto a screen, to show everyone, and read out by the facilitator.)

Problem 1: Fill in the blanks of the table in Figure 2. In this case, there should not be repeated the numbers 1 to 5 more than once in each row and each column of the square and each diagonal of the table [10].

1	2	3	4	5
4	3	5		

Figure 2

Presenter 1: Groups are given 5 minutes to complete this task. You can start, group leaders!

(Team leaders solve the problem and submit it to the jury)

1	2	3	4	5
3	5	2	1	4
5	1	4	3	2
4	3	5	2	1
2	4	1	5	3

Figure 3

Presenter 1: Dear audience and participants. The last round of the event is over. In the fourth round, we give the floor to the jury to announce the points scored by our leaders and the total scores of our teams from all conditions.

(The jury will announce the total scores of the groups and determine the winning team. At the same time, the participants of the math event will be presented with souvenirs by the school administration.)

Presenter 2: Dear students! You are a young generation of Khorezmians, Ferganaians, Beruni and Ibn Sina, Ulugbek, Navoi and Baburis, Bukhari and Termezians. At the same time, you are the future of our country. So never be tired of gaining new knowledge constantly and being deserving generation to our great ancestors.

Presenter 1: Never forget that our people, our Country expect great achievements from you. After all, fulfilling the expectations of the country and the people is the greatest happiness in the world.

Presenter 2: So we finish our today's math event. See you soon, dears! Stay healthy!

(All participants of the event will go to the stage and finish the event by singing the song "O'zbegim".)

In conclusion, we can say that the mathematical events dedicated to the life and work of our great scientists can be a great way to develop national and intercultural competencies such as students' devotion to the motherland, kindness to people, appreciation of national, spiritual and cultural heritage.

References:

1. Boboyev, A. (n.d.). *Uzbekistan is the land of great scientists.* Retrieved from www.muslim.uz
2. Mirziyoyev, Sh.M. (n.d.). *Speech by President of the Republic of Uzbekistan Shavkat Mirziyoyev at the Youth Forum of Uzbekistan*. Retrieved from www.sammi.uz
3. Mamadaliyeva, M. (1991). *Mathematics on the stage*. Tashkent: Publishing House - Teacher.
4. Mirzamurodova, A.L. (2018). *Methods of conducting mathematical events*. Moscow.
5. Viktorova, Z.V. (2003). *Methods of conducting mathematical events in secondary schools (at the first mathematical and Olympic games)*. Kirov.
6. Akmalov, A. (2019). *From "Algebra" to computer*. Tashkent.
7. Abdurahmonov, A. (1983). *Muhammad ibn Musa al-Khwarizmi was a great mathematician*. Tashkent.
8. Perelman, Y.I. (2014). *Interesting math*. Tashkent.
9. Khaydarov, B., Ismailov, Sh., Ismailov, A., Karimov, N., Soipova, I., & Tashtemirova, N. (2019). *Assessment of Mathematical Literacy in Pisa-2021 International Studies*. Tashkent.
10. Bakhromov, F., Burkhonov, S., & Khudoyorov, O. (2019). *A thousand and one puzzles*. Tashkent: Publishing House - "Sharq".