

GAMES IN THE FORM OF MATHEMATICAL
COMPETITIONS AS AN INSTRUMENT IN
STRENGTHENING MOTIVATION OF STUDENTS IN
STUDYING MATHEMATICS

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Background

Teaching methods that use games are almost absent in senior high schools and in institutions of higher education, despite the fact that even at these ages, games can help learners. Below we propose how to construct several models of games based on studying mathematics that are suitable for high school and university students.

The oldest form of mathematical competition is the classical math Olympiad in the form of the exam. Mathematical competitions among students have two main goals. The first goal is just like any other competition - to discover the strongest competitors. The second is to enhance interest in mathematics, which is considered a challenging subject for as great a number of students as possible. The first aim is quite achievable, however the other goal, is far less attainable. A competition in the form of the exam is not the best way to incite the students' interest. Even though we invest a lot of time and efforts in choosing suitable competitors we find that students who lose in the competition lose their confidence and are reluctant to participate in future competitions and are left out of our organizing efforts instead of getting additional motivation in studying mathematics. We propose several different forms of mathematical competitions.

The Blitz Mathematical Olympiad –Team Competition

One of the advantages of team competition is that nobody takes a full responsibility for the team's loss. All teams receive the same problem and are allotted 5-10 minutes to come up with a solution. In order to score points, teams must submit the solution to the problem within the allotted time. The solutions are immediately checked by the panel of judges who immediately announce the results to the participants and to the audience. This allows everyone to track the teams' score in real time, while observing the participants reactions (joy or disappointment...).

Symposium 3

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The important educational element of the Blitz Olympiad is achieved by allowing the teacher to explain the solution to the problem while the judges check the teams' answers. The best solutions should be displayed immediately. It is also recommended to print the correct solutions and hand these out to the participants in real time.

Internet Math Olympiad for students

Another form of the Olympiad is the Internet Mathematical Olympiad. The first online Math Olympiad of the Ariel University Center of Samaria was held in December 2006. The competition was held on the institution's website, with 47 participants from all departments. Over 750 students accessed the Olympiad website. Problems were posted on a dedicated area in the website for 3 hours. Students submitted their solutions by email. Scores were awarded for the solutions and for the time of submission. The list of problems was long enough and included very simple problems along with essentially more difficult non-standard ones. Our main principle in choosing problems is that it has to be interesting to solve or at least to try to solve something for as great a number of students as possible. We can also include in the list problems which develop the course and are based on the logic of the course. However, these problems are left aside from the course because of lack of time. The grading system is based on the principle that each problem is worth, for example, 100 points which are divided between students solving this problem. This simple principle prevents easy problem from having a strong influence on the results of students in the top of the winners' list.

This year the internet math Olympiad consists of two stages: semi-final and final. The competition has become international: more than 200 students from four countries (Russia, Ukraine, Romania and Israel) tried to solve problems on the semi-final of our Olympiad, more than 1329 students visited the site of the Olympiad. The number of views is 5795. Note that these numbers are the results of the semi-final alone.

To organize the final round with the use of web-cameras, allowing to the participants and the jury to see each other, can be proposed. In less modern form the final round can be organized also in the standard form of the exam under the control of one of the jury members. It is supposed that there is a member of jury in every University participating in the project. Students stay at their Universities and it is not necessary for them to come to other cities and countries, which makes the competitions of this sort unrealistic.

*Mathematical Creativity and Giftedness
in Out-of-School Activities*

The success of the Internet Olympiad proves that this form is interesting also for students. All information about this year internet Olympiad can be founded on the site: [i - olymp. net](http://i-olymp.net)