



# CMS Endowment Grant Report

**Title of Proposal:** Windsor-Essex County Regional Mathematics Olympiad  
**Year of Competition:** 2007  
**Grant amount:** \$2,000  
**Project duration:** Single Year  
**Type of Report:** Final  
**Period Covered:** February 1<sup>st</sup> - January 31<sup>st</sup> 2008

## Description of Activity:

The Windsor-Essex Mathematics Olympiad is an annual regional competition for grades 7 and 8 students. The purpose of this competition is to promote mathematics and to select a team to represent Windsor-Essex at the Ontario Mathematics Olympiad.

A hundred participants were selected from regional schools based upon performance on a multiple choice and short answer contest which was administered in the classroom. Volunteers from the University of Windsor, the South Western Ontario Association of Mathematics Educators, and the Windsor-Essex Catholic District School Board ran the following activities for the participants on March 8<sup>th</sup>:

8:40 - 9:00	Welcome and Warm Up Activity
9:00 - 9:45	Individual Competition
9:45 - 10:15	Break and Refreshments
10:15 - 11:00	Pairs Competition
11:15 - 12:00	Group competition
12:00 - 12:30	Lunch, Activities and Mathematical Magic Show
12:30 - 1:00	Announcements and Prizes

The individual competition consisted of twenty seven short answer creative word problems. In the pairs competition, students were asked to solve ten long answer questions. Both the individual and pairs competitions covered a wide variety of material from the grade 7-8 curriculum and often required students to combine ideas from different areas of mathematics. In the group competition, students were placed in teams of four. They were given polygon tile kits and were lead, in a series of questions, to determine all possible regular polygons which could be constructed from equilateral triangle and square tiles. Pairs and teams were formed to be gender and grade balanced and the organizers set the teams in order to ensure that the students would make new acquaintances. Mathematical prizes were awarded to top competitors and also to random students in a raffle. A video was made of the day's activities. Copies of the competition and video may be found here:

<http://web2.uwindsor.ca/math/wemo/>

For each category of gender and grade, the top six students from the WEMO individual competition were selected to participate in training for the Ontario Mathematics Olympiad. Weekly training sessions were held from mid-March until the end of May. The students received copies of Problems and How to Solve Them (Volume 3 from the series published by the Centre for Education in Mathematics and Computing) from which they worked. On April 29<sup>th</sup>, the students wrote another test consisting of long answer questions based upon enrichment material from the training sessions. We used results from this test and the WEMO individual competition, weighted 60% and 40%, to select eight students to form two grade and gender balanced teams for the OMO.

### **Effectiveness:**

WEMO was not a small undertaking. Teachers, professors, concurrent and consecutive mathematics education students, and school board representatives collaborated to create three papers for WEMO itself, two additional selection competitions, and material and lessons for eleven training sessions. WEMO received funding from the CMS, the faculties of Education, Engineering, and Science at the University of Windsor, and the Windsor Essex Catholic District School Board.

The competition was a huge success. Here is an excerpt from our report on our post-competition survey:

- 91.8% of students enjoyed the competition
- 70.6% learned something on their own during the competition
- 63.5% learned something from other students during the competition
- 68% of students (almost uniformly distributed across the genders and grades) said that the competition increased their interest in mathematics
- 80% of students were encouraged to learn more about math due to the competition.

The survey results indicate that almost everybody benefitted from the educational and social aspects of the competition.

On March 8<sup>th</sup>, 20 consecutive and 10 concurrent mathematics teacher candidates volunteered to supervise and judge participants and to run miscellaneous errands. Prior to and following the competition, the core group of organizers designed competitions, activities, and lessons for the WEMO participants. Among this group were teachers, school board representatives, professors from the Mathematics Department and Faculty of Education of the University of Windsor, and concurrent mathematics education students. Thus, WEMO was successful in realizing collaboration between educators from different levels.

Two students were employed through Windsor's Outstanding Scholars Programme which awards students scholarship money in exchange for working for faculty. By employing these students, we were able to hold a structured and

well-planned eleven week training programme with carefully designed lessons for WEMO participants and to make training material available on the web. These two students were engaged in creating competition questions, designing lessons and handouts for the training sessions, lecturing to students, and creating a webpage for WEMO. With their help, the WEMO training participants were able to cover a lot of material, including elementary number theory, Euclidean geometry, basic combinatorics, patterning, and algebra, with an emphasis on proofs. The organizers were able to see many of the students progress in mathematical thinking, self-expression, and social interaction. Although local mathematics competitions tend to be dominated by students who attend a local math circle that is nationally renowned, one of the two grade eight girls who made the team was not such a student, and a significant number of students who came close to making the team were also in that category. This indicates to us that the training sessions were valuable to all that attended. The WEMO participants enjoyed training, with all students continuing to train after April 29<sup>th</sup> whether or not they had been named to Windsor's team.

The organizers were very pleased with the work of the Outstanding Scholars students. Feedback from our Outstanding Scholars students concerning their involvement with WEMO was overwhelmingly positive. In particular, they cited the practical experience and the opportunities to interact with students as invaluable benefits of their participation in WEMO. One of the scholars wishes to continue her work next year although, in her fifth year, she will no longer be eligible for payment from the Outstanding Scholars Programme. The organizers also provided partial funding to this student to attend the Mathematical Association of America's annual conference, where she gained exposure to interesting enrichment ideas for the classroom from educational luminaries such as Erik Demaine. Here is the student's feedback concerning this experience:

This summer I was given the opportunity to attend MathFest, the annual summer meeting of the Mathematical Association of America in Madison, Wisconsin. Over the course of five days I attended mathematical talks, including talks on mathematics education. As a future teacher, this conference provided me with many ideas and plenty of information. In addition to attending talks and participating in activities at MathFest, I was able to enrol in a two-day course entitled "How to Run a Successful Math Circle". I decided to take this course to improve on the skills that I used this past year while working on the Windsor-Essex Math Olympiad (WEMO). With WEMO I helped in the creation of assessments and assisted in the running of events. I also developed and administered lessons to aid in the preparation of our students for the Ontario Mathematics Olympiad. During this course, I was given resources and information from the organizers of three successful math circles from across America. Part of the course was to develop our own math circle and present it in small groups. Of all the math circles, the one I developed was the only one chosen to be presented to the entire group. It was a great experience to have math teachers from across North America engaged in my math circle and to gain feedback from the experts. I will be able to apply these refined skills this coming year when I volunteer with WEMO again. I am very grateful for this opportunity and it is my hope that this year's students gain from what I've learned.

Michelle Cylwa

### Future Plans:

This fall term, we will apply the money which remains from our funding towards teacher outreach. Many teachers in the region have taken note of the remarkable performance of students who attend math circles and wish to have such enrichment activities for their own students. We will hold workshops to expose them to such material and to help them prepare their students for mathematics competitions.

### Financial Report:

<b>Revenue</b>		<b>Expenses</b>	
CMS Endowment Grant	\$2,000	Name badges	\$35.31
		References (books, CD)	\$257.59
		Books for students	\$633.15
		Refreshments (training)	\$200.10
		Travel (MathFest 2008)	\$322.68
		Teacher outreach (future)	\$551.17
<b>Total:</b>	<b>\$2,000</b>		<b>\$2,000</b>

<b>Other Revenue</b>		<b>Expenses</b>	
WECD SB	\$2,000	WEMO prizes and gifts for volunteers (math puzzles etc.)	\$465.34
Faculty of Education, U Windsor	\$2,500	WEMO trophies	\$331.87
Faculty of Engineering, U Windsor	\$1,000	WEMO lunch	\$485.50
Faculty of Science, U Windsor	\$2,000	OMO transportation	\$1,643.78
		OMO registration	\$1,500.00
		Committee expenses	\$247.35
Faculty of Science, U Windsor		Two Outstanding Scholars employees	
WECSB/Faculty of Education		Printing, photocopying	
<b>Total:</b>	<b>\$7,500</b>		<b>\$4,673.84</b>

More revenue will be used in the future for printing/photocopying. We distributed materials to teachers electronically to save printing costs and found that the competition was not fully accessible to students since some schools had no money for printing/photocopying.

Please find attached an additional report with survey results concerning gender and competition preference, as requested.

Contact:

Wai Ling Yee  
[wlyee@uwindsor.ca](mailto:wlyee@uwindsor.ca)

**Organizing committee:**

Michelle Cylwa	Concurrent mathematics secondary education student	University of Windsor
Frank DiPietro	Curriculum coordinator President	Windsor-Essex Catholic DSB SWOAME (South Western Ontario Association of Math Educators)
Justin Lariviere	Director, Math and Stats Learning Centre	Department of Math and Stats. University of Windsor
Dragana Martinovic	Assistant Professor	Faculty of Education
Leo Moscone	High school teacher Treasurer	Windsor-Essex Catholic DSB SWOAME
Reginald Robson	Concurrent mathematics secondary education student	University of Windsor
Todd Romiens	Professor	Faculty of Education
Christine Sasso	Elementary school teacher	Windsor-Essex Catholic DSB
Theresa Salinger	Concurrent mathematics secondary education student	University of Windsor
Wai Ling Yee	Assistant Professor	Department of Math and Stats. University of Windsor