

The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING
Faculty of Mathematics
University of Waterloo
200 University Ave. W.
Waterloo, ON, Canada N2L 3G1



www.cemc.uwaterloo.ca

Le CENTRE d'ÉDUCATION
en MATHÉMATIQUES et en INFORMATIQUE
Faculté de mathématiques
Université de Waterloo
200, avenue Université Ouest
Waterloo (ON), Canada N2L 3G1

3-DAY ANNUAL SUMMER CONFERENCE for **GRADE 7 and 8** TEACHERS of MATHEMATICS

The CEMC at the University of Waterloo provides professional development opportunities for mathematics teachers. Our programs respond to the need for practical and enrichment information that can be implemented immediately in the classroom.

Problem solving forms the basis of effective mathematics programs. The sessions on curriculum will focus on problem solving. This conference will increase your tools and skills and enhance your teaching of mathematics.

While the curriculum sessions are directed specifically at teachers from Ontario, teachers from any province or country will benefit. Teachers should have some previous teaching experience in an elementary or high school.

Whatever your personal, professional or mathematical goals, our conference can give you the edge you want.

Tuesday August 20 to Thursday August 22, 2019

(Limited enrolment so it is better to register early)

*Participant cost of \$180 includes accommodation, meals, conference materials,
and harmonized sales tax (HST)*

Participation is restricted to two teachers per school

Accommodation in a dormitory room is provided at no additional cost, if needed

Registration Now Open!

Follow the link <http://www.cemc.uwaterloo.ca/events/mathteachers.html> to register online



Grades 7 and 8 Program

- Dates:** Starting Tues. August 20 at 8:45 am, ending Thurs. August 22, 2019 at 1:30 pm
- Location:** St. Paul's University College, University of Waterloo
- Program:** The focus is on presentations as well as attendee participation in mathematical activities and problem solving. These resources are intended to supplement your teaching program.

Monday, Aug. 19	Activity
3:00 pm – 8:00 pm	Early Registration in St. Paul's University College (STP)
5:00 pm – 6:00 pm	Dinner in St. Paul's University College (STP)
9:00 pm – 10:30 pm	Pizza and refreshments in Watson's Eatery at St. Paul's University College (STP)
Tuesday, Aug. 20	
7:30 am – 8:45 am	Registration and Breakfast in St. Paul's University College (STP)
8:45 am – 9:45 am	Meet and Greet. <i>Rob Gleeson</i> About the CEMC. <i>Ian VanderBurgh</i>
10:00 am – 11:30 am	Session 1: Let's Solve Some Problems! <i>Ian VanderBurgh</i>
11:30 am – 12:15 pm	Lunch at St. Paul's College (STP)
12:30 pm – 2:00 pm	Session 2: Spiraling and The Thinking Classroom. <i>Gerald Lewis, Brennan Caverhill</i>
2:15 pm – 3:15 pm	Session 3: 5 Practices for Orchestrating Productive Mathematics Discussions. <i>Marcel te Bokkel</i>
3:40 pm – 4:40 pm	Session 4: Area Models in Intermediate Math. <i>Marcel te Bokkel</i>
5:15 pm – 6:30 pm	Dinner at St. Paul's University College (SPC)
6:30 pm – 7:30 pm	Campus Tour beginning from the front foyer of St. Paul's University College (STP)
7:30 pm – 11:00 pm	Games, Hospitality, and Refreshments.
Wednesday, Aug. 21	
7:30 am – 8:30 am	Breakfast at St. Paul's University College (SPC)
8:45 am – 10:15 am	Session 5: Enriching Your Math Classroom <i>Lori Yee</i>
10:30 am – 12:00 pm	Session 6: Problem Solving with a Link to Algebra and Patterning <i>Dennis Anderson</i>
12:00 pm – 12:45 pm	Lunch at St. Paul's College
1:00 pm – 2:00 pm	Session 7: The Discovery of Pi. <i>Dennis Anderson</i>
2:15 pm – 3:15 pm	Session 8: For the Love of Spatial Thinking. <i>Kevin Shonk</i>
3:40 pm – 4:40 pm	Session 9: Free Online Ontario Mathematics Courseware. <i>Ashley Sorensen, Kevin Shonk</i>
6:00 pm – 9:30 pm	Banquet in Federation Hall (FED)
Thursday, Aug. 22	
7:30 am – 8:30 am	Breakfast at St. Paul's University College (SPC)
8:45 am – 10:15 am	Session 10: Seeing the Meaning. <i>Paul Alves</i>
10:30 am – 12:00 am	Session 11: Student Engagement In Mathematics Through Social Media. <i>Michael Frankfort, William Gourley</i>
12:00 pm	Wrap-up. Resource Sharing. Final Thoughts.
12:05 pm	Lunch at St. Paul's College (SPC)

Register, view program online, by visiting <http://www.cemc.uwaterloo.ca/events/mathteachers.html>

Registration Fee: \$180, per registrant. This includes three meals each day (breakfast, lunch and dinner) and accommodation in a dormitory room, if required.



Synopses of Sessions for Math Teachers' Conference – Grade 7 and 8 Teachers

Session 1:

Let's Solve Some Problems!

Ian VanderBurgh

It is a rare time to be able to sit down to just solve some problems. It is also important to get the chance to stretch our brains by working on some problems that are harder, but still accessible. In this session, we will work through a handful of problems, aiming to talk through approaches to some harder, but still accessible, problems that could be interesting for use as enrichment and discussion in the classroom. We will also talk about the hard task of teaching problem solving.

Session 2:

Spiraling and the Thinking Classroom

Gerald Lewis, Brennan Caverhill

Tired of saying to your students, "You already learned this," or "You should have remembered this from last year"? Many principals and superintendents are mentioning spiraling, but teachers often don't know how to incorporate it successfully. Based on *Make It Stick: The Science of Successful Learning*, this workshop will explore retrieval practice, interleaving, and desirable difficulties with problem solving in the Grade 7-8 Math classroom. Using CEMC Problem of the Week, Nelson Math, and the Thinking Classroom model designed by Peter Liljedahl, the workshop will challenge teachers to start spiraling their math lessons right away for the new school year.

Session 3:

5 Practices for Orchestrating Productive Mathematics Discussions

Marcel te Bokkel

The 5 Practices are a framework for creating and implementing lessons that use student work as the focal point for engaging in mathematical discussions that leads to deeper understanding. By identifying and naming the practices, teachers can take control of a problem solving session to ensure that student thinking builds towards the learning goal. Using VNPS/VRG model to get a class going, the 5 practices will enhance any mathematical discussion and provide opportunities for all students to think, discuss and learn.

Session 4:

Area Models for the Intermediate Learner.

Marcel te Bokkel

Visual representations play a critical role in opening access to understanding for all students. In this session, we will explore the use of area models in building towards algebraic thinking for the intermediate/senior student. We will examine some teaching strategies, use some manipulatives and discuss some resources.

Session 5:

Enriching your Math Class

Lori Yee

Do you have a gifted student in your class? Have students that finish their math work long before the other students? This session will look at ideas that can enrich math class for one student or many. Tricks and tips will be provided to supplement and improve enrichment opportunities in your classroom.



Session 6 &7:

Problem Solving with a Link to Algebra and Patterning and the Discovery of Pi.

Dennis Anderson

We will solve a number of algebra problems using patterning and graphing with a focus on helping students determine general formulas. Problems will be at various levels including ones for enrichment and group work. Incorporating technology into mathematics lessons will be demonstrated through the use of Smart Notebook software, TinkerPlots, Geometer's Sketchpad, YouTube videos and other Internet websites. A "Discovery of Pi" lesson will also demonstrate the use of various software as well as hands-on group work.

Session 8:

For the Love of Spatial Thinking.

Kevin Shonk

In mathematics, we sometimes get bogged down with numbers and operations while the development of spatial thinking is squared away during a geometry unit. In this session, we will rekindle our love of spatial thinking as we explore some spatially themed games and problems, some of which remain unsolved in mathematics. We will venture into the movie "Good Will Hunting", spend some quality time with rectangles and even investigate Brussels sprouts, all while lighting that spark that inspires us as mathematicians.

Session 9:

Free Online Ontario Mathematics Courseware.

Ashley Sorensen, Kevin Shonk

The University of Waterloo has developed free online resources for Grade 7 and 8 Mathematics. These resources include video instruction with interactive and exploratory features, review questions that provide immediate feedback, and student exercises with solutions. Teachers will have an opportunity to explore the content and consider how the different features can be used to enhance teaching and learning.

Session 10:

Seeing the Meaning.

Paul Alves

More and more research is showing that students with a strong spatial understanding will benefit in their understanding of math as they advance from year to year. But how do we capitalize on this spatial understanding for topics involving number sense like integers and fractions? In this session we will explore a trajectory of learning for these topics that builds on spatial understanding and provides a strong conceptual foundation for further learning. We will also explore how this development leads into topics in the high school curriculum.

Session 11:

Student Engagement In Mathematics Through Social Media.

Michael Frankfort, William Gourley

Social Media plays a large role in our society these days, from #fakenews to #challenges. In this workshop, participants will examine the mathematical connections that can be made from social media topics, viral videos and things that are hashtagable. In order to engage today's learners, teachers need to expose students to explorations and experiences that are authentic and relevant. By using social media items, such as the water bottle challenge and news events (fact or fiction), we can learn to examine these from a mathematical perspective and connect them to our Mathematics learning in the classroom.