



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 21 to Thursday August 23, 2018

(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 Tuesday August 21 at 8:45 am, ending Thursday August 23, 2018 at 1:30 pm
- Location:** Mathematics and Computing Building, 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. 20	Activity
3:00 pm – 8:00 pm	Early Registration in St. Paul's University College (SPC)
5:00 pm – 6:00 pm	Dinner in St. Paul's University College (SPC)
9:00 pm – 10:30 pm	Pizza and refreshments in Watson's Eatery at St. Paul's University College (SPC)
Tuesday, Aug. 21	
7:30 am – 8:45 am	Registration and Breakfast in St. Paul's University College (SPC)
8:45 am – 9:45 am	Meet and Greet. <i>Dean Murray</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 – 12:30 pm	Lunch in the Mathematics and Computing Building (MC)
12:30 pm – 2:00 pm	Session 2: Problem Solving with a Link to Algebra and Patterning. <i>Dennis Anderson</i>
2:15 pm – 3:15 pm	Session 3: The Discovery of Pi. <i>Dennis Anderson</i>
3:30 pm – 4:30 pm	Session 4: Seeing the Meaning. <i>Paul Alves</i>
5:15 pm – 6:30 pm	Dinner in St. Paul's University College (SPC)
5:15 – 8:00 pm	Centre for Education in Mathematics and Computing (CEMC) and Grand Valley Mathematics Association (GVMA) teacher resources available for purchase.
6:30 pm – 7:30 pm	Campus Tour beginning from the front foyer of St. Paul's University College (SPC)
7:30 pm – 10:30 pm	Games, Hospitality, and Refreshments
Wednesday, Aug. 22	
7:30 am – 8:30 am	Breakfast in St. Paul's University College (SPC)
8:45 am – 10:15 am	Session 5: Student Engagement in Mathematics Through Social Media. <i>Mike Frankfort, Ming Huang</i>
10:30 am – 12:00 pm	Session 6: Problem Solving? No Problem! – Integrating Problem Solving into your Mathematical Program. <i>Catherine Rivera</i>
12:00 pm – 12:45 pm	Lunch in the Mathematics and Computing Building (MC)
1:00 pm – 2:00 pm	Session 7: For the Love of Spatial Thinking. <i>Kevin Shonk</i>
2:15 pm – 3:15 pm	Session 8: Visualizing Your Number Sense: Moving from the Concrete to the Diagrammatic to the Symbolic. <i>Michael Jacobs</i>
3:30 pm – 4:30 pm	Session 9: Exploring Engagement. <i>Brian McBain</i>
6:00 pm – 9:00 pm	Banquet in Federation Hall (FED)
Thursday, Aug. 23	
7:30 am – 8:30 am	Breakfast in St. Paul's University College (SPC)
8:45 am – 9:45 am	Session 10: Free Online Ontario Mathematics Courseware. <i>Carrie Knoll, Kevin Shonk</i>
10:00 am – 11:00 am	Session 11: 5 Practices for Orchestrating Productive Mathematics Discussions. <i>Marcel te Bokkel</i>
11:15 am – 12:30 pm	Session 12: Mind the Gaps. <i>Michael Jacobs</i>
12:30 pm	Session 13: Wrap-up. Resource Sharing. Final Thoughts.
12:35 pm	Hot Lunch in the Mathematics and Computing Building (MC)

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 and 3:

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 4:

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 5:

Student Engagement In Mathematics Through Social Media.

Michael Frankfort, Ming Huang

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 hashtable. 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.



Session 6:

Problem Solving? No Problem! – Integrating Problem Solving into your Mathematical Program.

Catherine Rivera

Mathematics should be active, not passive. During this session, we will examine the link between problem solving and how the brain learns. Together, we will explore classroom proven strategies and activities across the curriculum that can be integrated into your program to advance mathematical discussion and improve student understanding and engagement.

Session 7:

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 8:

Visualizing Your Number Sense: Moving from the Concrete to the Diagrammatic to the Symbolic.

Michael Jacobs

I want to improve my students' number Sense but I'm not sure how.' Building on research and practical ideas from around the world, this hands-on session will explore ways how all teachers can improve their students' number Sense by using the Concrete-Diagrammatic-Symbolic continuum. In particular, we will look at the big ideas of Quantity, Operations and Fractions.

Session 9:

Exploring Engagement.

Brian McBain

What does it take to get students engaged in mathematics? Do manipulatives, problem solving, white boards, technology or 3 act math tasks help? In this session, we will look at some different activities and what makes them engaging (or not engaging) for our students.

Session 10:

Free Online Ontario Mathematics Courseware.

Carrie Knoll, 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 11:

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 12:

Mind the Gaps.

Michael Jacobs

It is very common for students coming into Grade 9 to have gaps in their knowledge. However, sometimes these misconceptions have gone unnoticed by both teachers and students. Together we will look at some tried and tested diagnostics that will expose these misconceptions. We will look at why such misconceptions occur and what we can do to rectify them thus easing the transition from Grade 8 to Grade 9.