

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



www.cemc.uwaterloo.ca

Le CENTRE d'ÉDUCATION
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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 22 to Thursday August 24, 2017

(Limited enrolment so it is better to register early)

Participant cost of \$150 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 22 at 8:45 am, ending Thursday August 24, 2017 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. 21	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. 22	
7:30 am – 8:45 am	Registration and Breakfast in St. Paul's University College (SPC)
8:45 am – 10:00 am	Meet and Greet. <i>Dean Murray</i> About the CEMC. <i>J.P. Pretti</i>
10:15 am – 11:45 am	Session 1: Problem Solving with a Link to Algebra and Patterning and the Discovery of Pi. <i>Dennis Anderson</i>
Noon – 12:45 pm	Lunch in the Mathematics and Computing Building (MC)
1:00 pm – 2:30 pm	Session 2: Problem Solving with a Link to Algebra and Patterning and the Discovery of Pi. <i>Dennis Anderson</i>
3:00 pm – 4:30 pm	Session 3: Problem Solving? No Problem! – Integrating Problem Solving into your Mathematical Program. <i>Catherine Rivera</i>
5:15 pm – 6:30 pm	Dinner in St. Paul's University College (SPC)
6:00 pm – 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. 23	
7:30 am – 8:30 am	Breakfast in St. Paul's University College (SPC)
8:45 am – 10:15 am	Session 4: Enriching your Math Class. <i>Lori Yee</i>
10:30 am – noon	Session 5: Area Models for the Intermediate Learner. <i>Marcel te Bokkel</i>
Noon – 12:45 pm	Lunch in the Mathematics and Computing Building (MC)
1:00 pm – 2:30 pm	Session 6: Opening up Mathematics for a Growth Mindset. <i>Wendy Bain</i>
3:00 pm – 4:30 pm	Session 7a: Social Justice and Mathematics. <i>Mike Frankfort, Gerard Lewis</i>
<i>Choose a session</i>	Session 7b: Metamobius Surfaces - the greater reality of one-sidedness. <i>Ted Gibbons</i>
6:00 pm – 9:00 pm	Banquet in Federation Hall (FED)
Thursday, Aug. 24	
7:30 am – 8:30 am	Breakfast in St. Paul's University College (SPC)
8:45 am – 10:15 am	Session 8: Free Online Ontario Mathematics Courseware. <i>Carrie Knoll, Kevin Shonk</i>
10:30 am – 12:15 pm	Session 9: Mind the Gaps. <i>Michael Jacobs</i>
12:15 pm – 12:30 pm	Session 10: Wrap-up. Resource Sharing. Final Thoughts.
12:30 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: \$150, 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 and 2:

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 3:

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 4:

Enriching your Math Class.

Lori Yee

Have a gifted student in your class? Need a way to enhance your math 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 5:

Area Models for the Intermediate Learner.

Marcel te Bokkel

In this session, we will explore the use of area models in an intermediate setting. An area model is a graphical representation of a multiplication or division problem. Area models are used to help students better visualize what is happening in a problem, creating a conceptual understanding of often abstract problems. For problems involving smaller numbers, drawing the model on a grid can make calculations easier. We will examine some teaching strategies, use some manipulatives and discuss some resources.



Session 6:

Opening up Mathematics for a Growth Mindset.

Wendy Bain

Low floor, high ceiling tasks that can be solved using various approaches allow students to work with a growth mindset in mathematics. We will discuss how to create tasks that provide enough differentiation so that all students can access them and work in their zone of proximal development, and we will solve such a problem with an entry point for every student and multiple ways for students to extend their learning.

Session 7a:

Social Justice and Mathematics.

Michael Frankfort, Gerard Lewis

In this session, we will work through mathematical explorations that address issues of social justice, such as bullying, fairness and the affordability of food. The group will discuss issues and approaches to incorporating socially relevant contexts into inquiry-style mathematics lessons in grades 7/8/9. We will share some examples and problems from our own classes that demonstrate mathematics and social justice.

Session 7b:

Metamobius Surfaces - the greater reality of one-sidedness.

Ted Gibbons

Since its discovery 170 years ago, one-sidedness has been relegated to variations on the Mobius strip and the Klein bottle. Ted has broken this barrier with his creation of the Metamobius Process, which generates an almost endless series of fascinating one-sided surfaces that are fundamental to defining the greater reality of one-sided geometry - metamobius surfaces. And because of their intrinsic beauty, these surfaces have even become a geometric art form. Ted will present a delightful, fun-filled overview of one-sidedness, including metamobius models and his creation of a one-sided grammatical structure! He will then lead an interactive workshop where participants can learn the simple basics of the Metamobius Process to create their own metamobius surfaces.



Session 8:

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 9:

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.