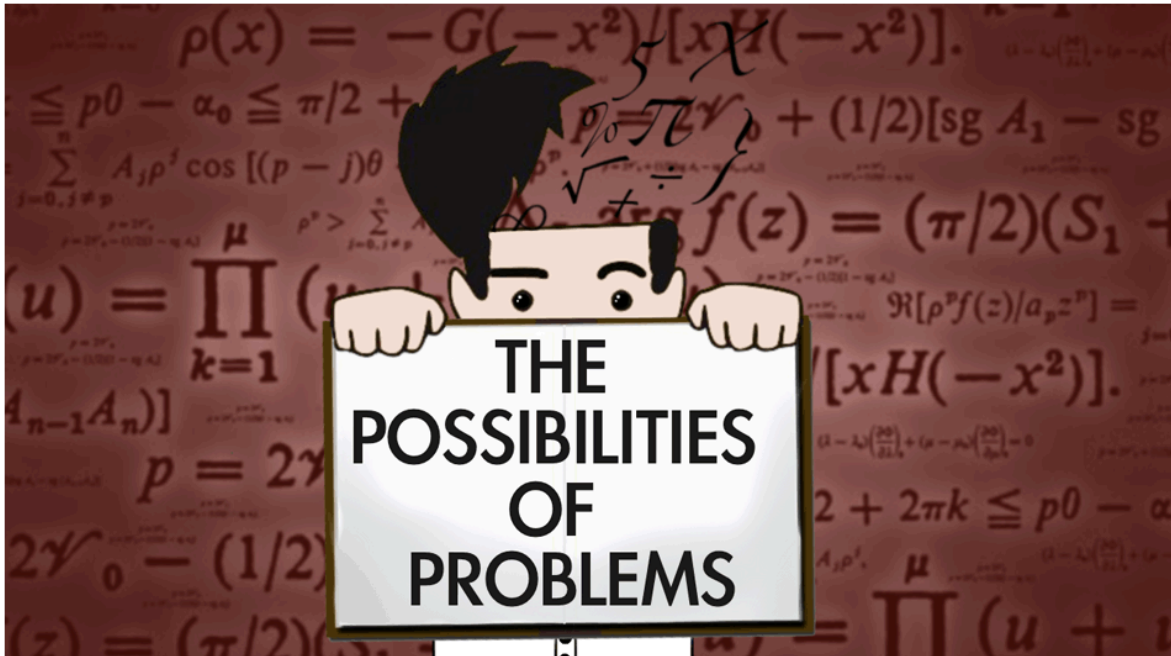


ISOMA Conference 2013



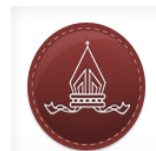
ISOMA Conference Details

- Date:
Wednesday January 9th, 2013
- Location:
The Bishop Strachan School, 298 Lonsdale Road, Toronto, Ontario
Link to directions <http://goo.gl/maps/6vezr>
Limited Parking will be available on site. There is a Green P lot indicated on the map as well as some parking on side streets around the school. The school is just a short walk from the St. Clair West subway station.
- Schedule:

1:30 – 1:45	Registration
1:45 – 2:30	Project Sharing by grade bands
2:40 – 3:30	Session A
3:40 – 4:30	Session B
4:30 – 5:00	Wine and Cheese
5:00 – 6:00	Key Note Address



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ISOMA Registration Details

- Registration may be completed on-line by following the link below.
<http://isoma2013.sched.org/>
To register for a session sign up to create a profile and star the sessions you would like to attend.
If you have any questions about your registration please contact
JMahood@bss.on.ca
- Costs: \$40 OAME member, \$55 non-member, \$25 students
Not an OAME member yet? Visit the link below and join today!
<http://www.oame.on.ca/main/index1.php?lang=en&code=membership>
- Please bring payment to the conference. Cash or cheque is the only method of payment accepted. Please make cheques payable to ISOMA and submit a single cheque for all teachers from one school.
- Registration opens Monday Nov. 26, 2012 and closes Monday Dec. 10, 2012

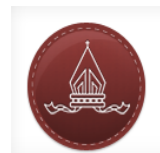
Keynote Address - PBL: Agency, Activity, and Inquiry

What is Problem-Based Learning and what can it do for you and your students? Many teachers are looking for ways in which to engage students and increase their ownership of their learning while at the same time allowing for rigor and connection to the material. Teaching with problems is one way for this to happen if students are able to access prior knowledge through scaffolded problems that lead to new ideas. The PBL classroom has many advantages and challenges and we will discuss them in this talk.

Get ready to learn about the differences between Problem-Based and Project-Based learning as well as the ways in which you might be able to incorporate some of these ideas into you classroom without making drastic changes. Using cognitive apprenticeship, students can become more agentic, empowered and self-regulating while you learn the skills needed to coach and summarize. It's a journey worth taking together.



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About the Keynote Speaker

Carmel Schettino is an experienced secondary school educator, teacher educator, published author, curriculum writer and a doctoral candidate in Curriculum and Instruction at the University at Albany-SUNY. She worked extensively with teachers in the area of Problem-Based Learning for over 15 years integrating what teachers currently do in their classroom practice in order to make use of PBL techniques. Her research interests include relational pedagogy, classroom discourse practices, gender equity and social justice in relation to PBL in secondary mathematics teaching and learning. (www.carmelschettino.org)

Project Sharing

Participants will begin the conference having an opportunity to share project ideas, successes and challenges with fellow educators focusing on similar grade strands. Your strand facilitator will provide additional details once registration is complete. We have divided the curriculum into the following five strands: Advanced Functions and Calculus, Data Management, Grade 11, Grades 9 and 10, Grades 7 and 8.

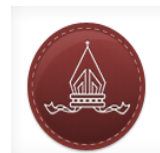
Session A

A1: Problem-based learning through meaningful activities in a Grade 8 Classroom
Mehdi Benchaabane & Chandra Boon, Branksome Hall, Toronto

In this session, we will present a paradigm shift in the design of classroom activities for Grade 8 Mathematics. Our teaching experiment started by reconsidering the clustering of the syllabus into Units of Concepts and assuming instead, that students will reach a deeper understanding of these concepts if they were taught through problem-solving. In fact, the challenge was to have students know at any point through the syllabus : what they were supposed to be solving and what for. This approach to curriculum and assessment design was inspired from the Activity Theory framework that schematizes the interrelations between the different elements of learning. Although it is still in the experimental stage, the impact on our students' learning shows a considerable potential that despite the challenges of adopting a new teaching approach, is way better than the traditional schemes of work. This session is particularly relevant to teachers of Grades 7 to 10.



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A2: Inviting Praxis: Problem-Inspired Learning

Andrew Lorrison, The Bishop Strachan School, Toronto

How often have you heard:

I hate math!

I blank out on tests.

I never have time for homework.

I was getting 80's before, but now...

Why do I have to take math?

And, how often have you heard yourself saying:

How can I motivate my students to...?

In this session, we will reframe 'the problem' as an invitation for the student, and teacher, to learn more about themselves as a learner. Our focus will be on identifying, using and transforming problems into opportunities for self-reflective, mindful and, above all, self-directed growth.

This is appropriate for all grades but with an emphasis on the high school experience.

A3: Problem Solving with CEMC

John Galbraith, Centre for Education in Mathematics and Computing, Faculty of Mathematics, University of Waterloo

Problem solving is an integral part of the secondary school mathematics curriculum. The CEMC is known for its contests. The contest resources and others like Problem of the Week are useful in promoting and encouraging problem solving. In this session we will look at some of the free resources available from the CEMC and how they might be used to help students become better problem solvers.

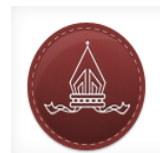
A4: Problem solving using the Rubik's cube

Glen Algarvio, Royal St. George's College, Toronto

In this session we will explain how the Rubik's cube can be used to help students learn to problem solve. The Rubik's cube incorporates the importance of following instructions, designing algorithms, cooperative learning, 3-D spatial awareness and confidence building. Learning how to "cube" provides a fun and motivating way for learners to tackle the framework for problem based learning. By breaking problems down into simpler steps, even the most challenging math and science questions can be solved. This session is of particular interest to teachers in both the junior and intermediate levels.



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A5: Project Mathematician

James Hay, Sterling Hall, Toronto

Consider the mathematician as visionary, creator, cultural observer, scientist, economist, artist, inventor, geometer... The workshop will explore the ways that students respond to challenging open-ended project-based activities. Teachers will examine the means to plan, implement, conference, and evaluate engaging projects that their students will appreciate. Participants will take away a series of plans for middle-school level projects and develop the framework to develop their own.

A6: Using a problem solving approach with students who have math disabilities.

Dawn Frank, Montcrest, Toronto

Students who have math disabilities attempt to remember math concepts individually, and then become overwhelmed trying to remember algorithms and confused when they have to integrate a variety of concepts on tests or inquiry assignments. This session will provide problem-based strategies to help struggling students understand the relationships between concepts. We will focus on multiplication and demonstrate the relationship between multi-digit multiplication and multiplication of fractions, decimals, and simple algebraic expressions. We will explore ways to adapt these strategies to other types of problems and to scaffold problems so that struggling students can find success.

A7: Using Exeter PBL Materials

Deidre Timusk and Richard Tong, Upper Canada College, Toronto

Interested in using the free problem based learning materials from Philips Exeter Academy? These materials were developed by a department of 28 mathematicians over the past eighteen years and are used at this prestigious boarding school in New Hampshire. We have adapted these materials for our schedule and our students. Come and hear how we did it and what our experience has been like.

A8: Using Technology to solve and communicate a problem

Jen Gravel, Holy Trinity School, Richmond Hill

How do we know what a student was thinking while solving a problem? How can we assist 21st century learners problem solve using technology? How can we assess each member's contribution to a group problem? This session will explore some solutions to these common issues and more. Using webFluidMath and GeoGebra, we will see how to visualize a problem. Using GoogleDocs, we will see how students can brainstorm and collaborate to solve problems inside and outside the classroom. And we will see how to easily create student videos that can help teachers and peers follow a solution to a problem. This session is appropriate for teachers in grade 7 through

12.



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Session B

B1: A Transformations Pitfall in the Functions and Advanced Functions Courses
Fraser Simpson, University of Toronto Schools, Toronto

Presenter Fraser Simpson (University of Toronto Schools) will introduce you to Perplexed Pat, who always makes the same mistake when graphing progressions of functions using transformations.

B2: Complex Cartoon Image Construction using Simple Equations
Charl van Niekerk, Ridely College, St. Catherines

In this session we will explore how to reproduce a complex cartoon image using only simple equations. Students use the slider function in GSP to build functions (Mostly linear, quadratic, and cubic) in order to obtain equations (with domain and range limits) that model portions of their chosen image. These equations are transferred to Graphing Calculator, so that each student ends up with an exact outline replica of the image they started modeling, 'built' out of equations only! But the fun doesn't stop there - Students now use inequalities to colour their image (Creating custom colours if necessary), ending up with an uncanny, almost exact replica of the original cartoon image. Students submit a Word report of their process and final product(s). The assignment may sound complicated, but it's actually quite straightforward, and students of all levels amaze themselves each year with their final products. An incredible application bringing together their core knowledge of equations, inequalities, domain & range, while exposing them to a variety of software. This session is of particular interest to teachers in the grade 11 and 12 levels.

B3: Time for some project based learning – Developing a Clock Project
Joe McRae, Wan Chow and Bethany Olson, Bishop Strachan School, Toronto

In this session, we will use a clock building project to contrast the differences between problem based and project based learning. Students will be constructing a clock and exploring the inner workings of the gears and mechanical systems. This will be an introduction to project based learning; starting from inspiration through project design, tuning and finishing with planning an exhibition. This is geared towards the middle school curriculum with elements from a variety of disciplines including math, science, design and technology.



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B4: Motivating the Study of Transformations of Functions through Exploration of Meaningful Data Sets

Russ Gordon, The Bishop Strachan School, Toronto

To change our world means changing the minds of those who inhabit it. To change minds, we must convince based on evidence. In this workshop we will examine selected, meaningful data sets using technology and explore a straightforward method that students can use to identify when a function best fits the given data. Through a scaffolded exploration of authentic data – encouraging students to make predictions about data that matters to them – we can motivate the study of transformations of functions. By doing so, we show our students one way to change minds – and change the world – using mathematics.

B5: Puzzles, Games, and Activities to Promote Thinking and Problem Solving in Middle School Mathematics

Carrie Annbele, Hillfield Strathallan College, Hamilton

In this session, I will present some puzzles, games, and activities that I have done with my grade 7 and 8 students to promote thinking and problem solving. Some of these activities and games are related to the curriculum and others are just to have some fun while being mentally challenged. At this session you will have a chance to play some of these games. There will also be a chance to share some of the activities that you are doing with your students so that together we can collectively increase our resources.

B6: Ubuntu? Spot It? Huh?

Carly Ziniuk, Jeff Mahood and Andrew Moffat, The Bishop Strachan School, Toronto

Have you heard of the card games Ubuntu or Spot It? The most crazy feature of the games is that any two cards selected will always have exactly one matching symbol to be found on both cards. It doesn't matter which card you pick! Huh?

This session will talk about the problem solving process we went through as we discovered how these cards work and the mathematics underlying the design. Learn how to use this game in classrooms from Grades 1-12!

B7: Using Visuals for Problem Solving in the 4U Courses

Betty Temmer, Managing Director of Autograph Canada

Younger students use manipulatives to gain a clearer understanding of a problem, work towards a solution, and explore extensions. Visuals provided by dynamic software can serve precisely the same roles for senior students. I will explore several problems in functions, calculus, 3D vectors and statistics and show how visuals bring in-depth understanding to problems that we often solved only algebraically in the past. Autograph software will be used.



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B8: *When, Where, What and Why: Four questions for inquiry-based teaching*
Ron Lancaster, Ontario Institute for Studies in Education, University of Toronto

We will examine a number of photographs taken around the world that lend themselves to asking probing questions such as "When was this photo taken?", "Where was it taken?", "What pattern do you see in the image?" and "Why was the photographer inspired to think mathematically?".

B9: *Scaffolding Problems for Optimal Learning in PBL*
Carmel Schettino, Deerfield Academy, Massachusetts

In this session, we'll talk about how to take an interesting problem (you'll have to come to see what it is!) and see how to break it down for your audience of students in order to get to what you want them to learn. PBL is all about having students use the problem and their prior knowledge to learn something new. But they need scaffolded questions and guidance in order to move through the steps if there is a structured learning goal. How is this done and how much should be done? Brainstorming and discussion will take place in this interactive session.

Organizing Committee

ISOMA President	Edith Louie, BH
ISOMA Chapter Representative to OAME	Jennifer Gravel, HTS
ISOMA Secretary-Treasurer	Richard Tong, UCC
Conference Coordinators	Sheila Barclay, BSS Janice Foster, BSS Jeff Mahood, BSS Carly Ziniuk, BSS

Special thanks to all the presenters for their time and willingness to share their expertise with us.

Special thanks to the faculty of the BSS Mathematics department and all the members of The Bishop Strachan School community who helped to host this event



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