Focus on Mathematics, K–12

Ontario’s renewed vision for education *Achieving Excellence* is built on the success of the reform initiatives of the past ten years. While this ministry document lauds the efforts to date, it also stresses there is a lot to be done to realize a truly excellent and equitable system.

EQAO data shows significant growth in elementary achievement rates. In 2002–03, 54% of students (at Grades 3 and 6) achieved an overall Level 3; today, that number has climbed to 72%. As well, there are more high school graduates than ever before. In 2002–03, the graduation rate was 68%; in 2014–15, it is 83%. Yet, there is not growth in achievement for all students, nor in all areas of the curriculum. The chart below highlights the work that lies ahead specifically in mathematics education.

Student Achievement Priorities for 2014–15

Ontario’s equity and excellence agenda for 2014–15 includes providing additional support for children and youth in care, students with special needs and Aboriginal students. It also includes focusing on improved results and transitions for students in the Applied streams. And, of course, the spotlight continues to be on mathematics. Here, in essence, is Ontario’s approach:

- Mathematics education today must include arithmetic but it must go beyond teaching and learning facts and procedures.
- Mathematics education must also support students in developing the ability to reason mathematically and to interpret and solve mathematical problems.
- High-quality mathematics instruction incorporates intentionally planned instructional strategies and learning activities such as direct instruction, investigation, practice, problem solving, critical thinking and proving.

Math Action Plan Components

- Knowledge mobilization of effective mathematics teaching and learning
- Additional opportunities for educators to build their expertise in mathematics and promote precise teaching in response to identified student learning needs
- Provision of resources for educators and parents that help support learning and achievement in mathematics
- Strategic interventions such as mobilizing supports for students experiencing challenges and monitoring “time on task”

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Adapted from the Fall 2014 Regional Symposia presentation of Mary Jean Gallagher, Assistant Deputy Minister of the Student Achievement Division.

### Mathematics Results

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>French</th>
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<tr>
<td></td>
<td>EQAO 2013-14</td>
<td>Change from 2012-13</td>
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<td>Primary Math</td>
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<td>Junior Math</td>
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<tr>
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<tr>
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Celebrating Summer Learning

Last spring, the ministry announced a number of new professional learning opportunities for teachers and school leaders in mathematics and mathematics education. From enrolling in Additional Qualifications courses to participating in summer learning sessions, Ontario educators kept the learning going by saying, “Count me in!”

What better way to start off this school year than by recapping the mathematics learning that took place in the summer just past.

**The Summer Learning Program just keeps growing!**

Over 5,000 Ontario students continued their engagement, enthusiasm and learning in mathematics by participating in the Summer Learning program managed and coordinated by the Council of Ontario Directors of Education (CODE) with funding and support from the Literacy and Numeracy Secretariat. This learning initiative started in the summer of 2010 with 28 boards offering summer literacy programs and since then it has expanded significantly with 64 boards now offering both literacy and numeracy programs.

Mathematics learning for primary students is an established part of this provincial summer learning program with many boards linking their summer programs to their ongoing efforts in the areas of teacher professional learning, parent engagement, teaching and learning strategies, research and use of data.

Visit [www.ontariodirectors.ca](http://www.ontariodirectors.ca) for information on this project’s impact. The growth and success of this very beneficial program is detailed throughout the reports and is evident in the testimonials from parents, teachers, students and system leaders in Ontario school boards.

**Supporting Principal Leadership in Mathematics**

One hundred principals and vice-principals participated in the summer mathematics institutes developed and facilitated by CPCO, OPC and ADFO in collaboration with the ministry’s Student Achievement Division. Dr. Christine Suurtamm of Ottawa University was the Lead Facilitator.

Participants engaged in hands-on math activities and collaborative inquiry and focused on mathematical content knowledge. They examined current research to address challenges, issues and myths regarding mathematics. They took part in a “Family Math Night” which demonstrated an excellent way to engage parents. Finally, they developed goals for mathematics for the next school year using the Ontario Leadership Framework and Ministry Growth Plan. A follow-up day for consolidation is being planned for the fall.

**OECTA Summer Institutes for Mathematics and Technology**

Over 400 teachers participated in the three-day OECTA institutes that took place across the province. Teachers engaged in learning activities that focused on problem-solving, using models and manipulatives, as well as developing skills in proportional, algebraic and geometric reasoning. They deepened their understanding of students’ mathematical misconceptions and how to address them through thoughtful and focused interventions. An “Ah-ha” moment for many was the realization that complex math concepts can be drawn from such child-friendly materials as origami and tangrams. Another highlight for participants was the use of number lines to represent all forms of mathematics – from whole numbers to fractions – as well as for money, measurement and conversions. The response to the institutes was overwhelmingly positive.
ETFO Summer Academy

Twelve hundred ETFO teachers, occasional teachers and early childhood educators welcomed the opportunity to collaborate with colleagues and share effective practices in ministry-funded learning sessions across Ontario. A major focus was helping teachers to make sense of the intricate balance in the math program between developing conceptual understanding and fluency with number skills. The sessions also explored how to facilitate understanding of math content through engaging hands-on and minds-on learning and suggested ways to infuse such opportunities into their programs in the fall. Feedback from these empowered, excited and inspired educators indicates that teachers want more manipulatives in their classrooms to support their students' learning, more time and more opportunities to focus on the math content to inform their teaching. As one member stated, “This course has changed my way of thinking. I've got a huge mathematical world to investigate and I have only just started!”

Professional Learning Opportunities Through Adobe Connect

During July and August, keen classroom educators took advantage of the virtual learning opportunities offered by the ministry. Three different series – each four sessions – were offered:

- Proportional Reasoning for Mathematics Educators
- Algebraic Reasoning for Mathematics Educators
- Supporting Students with Learning Disabilities in Mathematics.

Participants took part in rich discussions with facilitators and with one another through chat pods and sharing photos of their team's work for collective review. They solved math problems, shared solutions, examined student work and related how they intended to incorporate their learning to meet the needs of students.

The Adobe Connect platform enabled facilitators and participants to be in remote locations. Teams connected from board offices as well as personal residences.

Plans are underway to repeat these series in the fall of 2014.


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*We thank our partners at the Council of Directors of Education (CODE), the three principal councils – the Catholic Principals’ Council of Ontario (CPCO), the Ontario Principals’ Council (OPC) and the Association des directions et direction adjointes des écoles franco-ontariennes (ADFO) – the Ontario English Catholic Teachers’ Association (OECTA) and the Elementary Teachers Federation of Ontario (ETFO) for sharing their summer learning reports with us.*

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*Math in Motion is published every other month except during the summer.*


For more information or to make a comment, email dianne.oliphant@ontario.ca.
Math in Motion

Resource Round-up

Just for parents …

For a rich repository of practical tips, activities and resources to help parents support their child’s learning of mathematics, visit edugains. Look for Math Tips for Parents by Dr. Lynda Colgan of Queen’s University. We invite you to repost Dr. Colgan’s “tips” or cut and paste for your own newsletters.

Now updated and reprinted Doing Mathematics with Your Child. To download, visit abc123. Order copies from ServiceOntario. Log-in using the user name and password assigned to you by ServiceOntario. If you don’t have a username and password, please have your principal/vice-principal/coordinator contact webpubont-EDU@ontario.ca.

Paying Attention to Fractions …

This new timely addition to the Student Achievement Division’s Paying Attention to Mathematics series provides an in-depth look at this critical area of mathematics teaching and learning. Please note that the Ministry Math Team is designing a new online series of K to 12 Literacy and Numeracy Capacity Building Sessions, starting with fractions. Featured facilitator is Dr. Cathy Bruce of Trent University. Additional information coming in a forthcoming issue.

What Works in Mathematics?


Excitement about the ministry mathematics resources continues to build with every new school year — so watch for the 2014 Fall Resources Package from the Student Achievement Division. Direct your inquiries to studentachievement@ontario.ca.