

# PAYING ATTENTION TO MATHEMATICS Education

# K-12



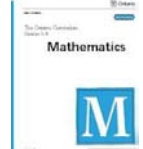
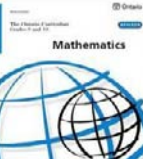

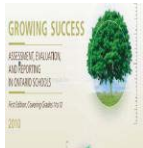
## Mathematics Resource Inventory

- ☒ **Policy Documents**
- ☒ **Support Documents**
- ☒ **Professional Learning Resources**
- ☒ **Classroom Resources**
- ☒ **Parent Resources**

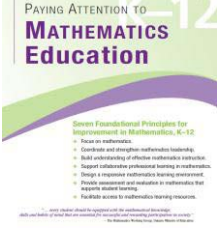
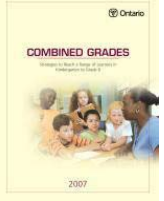
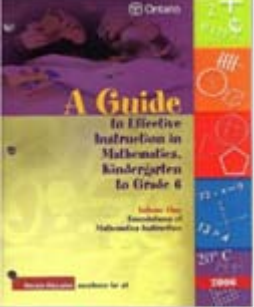
“... every student should be equipped with the mathematical knowledge, skills and habits of mind that are essential for successful and rewarding participation in society.”

– The Mathematics Working Group, Ontario Ministry of Education



## Mathematics Strategy: POLICY DOCUMENTS

Policy Document	Topic
	<a href="#"><u>The Kindergarten Program</u></a>
	<a href="#"><u>The Full-Day Early-Learning Kindergarten Program</u></a>
	<a href="#"><u>The Ontario Curriculum, Grades 1 to 8: Mathematics, 2005 (revised)</u></a>
	<a href="#"><u>The Ontario Curriculum, Grades 9 and 10: Mathematics, 2005 (revised)</u></a>
	<a href="#"><u>The Ontario Curriculum, Grades 11 and 12: Mathematics, 2007 (revised)</u></a>
	<a href="#"><u>Growing Success: Assessment, Evaluation and Reporting in Ontario's Schools, First Edition Covering Grades 1 to 12</u></a>


## Mathematics Strategy SUPPORT DOCUMENTS

Support Document	Topic
	<p><b><u><a href="#">Paying Attention to Mathematics, K-12</a></u></b>            Outlines seven principles to guide improvements in mathematics teaching and learning in Ontario schools:</p> <ul style="list-style-type: none"> <li>• Co-ordinate and strengthen mathematics leadership.</li> <li>• Build understanding of effective mathematics instruction.</li> <li>• Support collaborative professional learning in mathematics.</li> <li>• Design a responsive mathematics learning environment.</li> <li>• Provide assessment and evaluation in mathematics that supports learning.</li> <li>• Facilitate access to mathematics learning resources.</li> </ul>
	<p><b><u><a href="#">Combined Grades: Strategies to Reach a Range of Learners in Kindergarten to Grade 6, 2007</a></u></b>            This resource document provides suggestions for strategies to support teachers and administrators in the successful management of classes of combined grades in Kindergarten to Grade 6.</p>
	<p><b><i>A Guide to Effective Instruction in Mathematics K-6, 2006</i></b></p> <p><b><u><a href="#">Volume 1</a></u></b></p> <ul style="list-style-type: none"> <li>• Achieving and Sustaining Improvement</li> <li>• Principles Underlying Effective Mathematics Instruction</li> <li>• Planning the Mathematics Program</li> <li>• Instructional Approaches</li> </ul> <p><b><u><a href="#">Volume 2</a></u></b></p> <ul style="list-style-type: none"> <li>• Problem Solving</li> <li>• Communication</li> </ul> <p><b><u><a href="#">Volume 3</a></u></b></p> <ul style="list-style-type: none"> <li>• Classroom Resources and Management</li> </ul> <p><b><u><a href="#">Volume 4</a></u></b></p> <ul style="list-style-type: none"> <li>• Assessment and Evaluation</li> <li>• Home Connections</li> </ul> <p><b><u><a href="#">Volume 5</a></u></b></p> <ul style="list-style-type: none"> <li>• Approaches to Teaching Basic Facts and Multidigit Computations</li> </ul>

## Mathematics Strategy – PROFESSIONAL LEARNING

Professional Learning	Topic
 <p><b>Capacity Building Series Monographs</b> Research and practical strategies on key mathematics topics for 21<sup>st</sup> century educators.</p>	<p><a href="#"><u>“Maximizing Student Mathematical Learning in the Early Years”</u></a> – September 2011</p> <p><a href="#"><u>“Asking Effective Questions in Mathematics”</u></a> – July 2011</p> <p><a href="#"><u>“Bansho (Board Writing)”</u></a> – February 2011</p> <p><a href="#"><u>“Bansho Lesson Learning Goals”</u></a></p> <p><a href="#"><u>“Communication in the Mathematics Classroom”</u></a> – September 2010</p> <p><a href="#"><u>“Collaborative Teacher Inquiry”</u></a> – September 2010</p> <p><a href="#"><u>“Differentiating Mathematics Instruction”</u></a> – September 2008</p> <p><a href="#"><u>“Supporting Numeracy: Building a Community of Practice, K-12”</u></a> – August 2012</p> <p>↳ (Companion document) <a href="#"><u>“Annotated bibliography: Numeracy – Building a Community of Practice, K-12”</u></a> – August 2012</p> <p><a href="#"><u>“The Third Teacher”</u></a> – August 2012</p>
 <p><b>What Works Monographs</b> Concise research summaries designed to help practitioners put the best, evidence-tested ideas into practice at the school and classroom level.</p>	<p><a href="#"><u>“Learning Mathematics vs. Following Rules : The Value of Student - Generated Methods”</u></a> by Dr. Alex Lawson – February/March 2007</p> <p><a href="#"><u>“Student Interaction in the Math Classroom: Stealing Ideas or Building Understanding”</u></a> by Dr. Catherine D. Bruce – January/February 2007</p> <p><a href="#"><u>“ESL in the Mathematics Classroom”</u></a> by Dr. Richard Barwell – July 2008</p> <p><a href="#"><u>“Technology in the Mathematics Classroom: Harnessing the Power of Interactive White Boards”</u></a> by Dr. Catherine D. Bruce – March 2012</p> <p><a href="#"><u>“Word Problems: Connecting Language, Mathematics and Life”</u></a> by Dr. Richard Barwell – June 2011</p> <p><a href="#"><u>“Problem-Based Learning in Mathematics – A tool for Developing Students’ Conceptual Knowledge”</u></a> by Drs. Sheryl MacMath, John Wallace, and Ziaochong Chi – November 2009</p> <p><a href="#"><u>“Trigonometry in Grade 3?”</u></a> – by George Gadanidis August 2012</p>


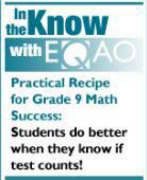
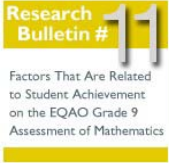

## Mathematics Strategy – PROFESSIONAL LEARNING

Professional Learning	Topic
 <p><b>LNS Webcasts</b></p>	<p><a href="#"><u>Leaders in Educational Thought</u></a> – Lucy West – June 27, 2012</p> <p><a href="#"><u>Teaching Mathematics through a Social Justice Lens</u></a> – November 3, 2011</p> <p><a href="#"><u>Honouring Student Voice in Mathematics</u></a> – November 3, 2011</p> <p><a href="#"><u>Three Part Lesson in Mathematics: Co-planning, Co-teaching and Supporting Student Learning</u></a> – June 1, 2011</p> <p><a href="#"><u>Through the Eye of the Learner: From student Work to Teacher Practice</u></a> – March 4, 2011</p> <p><a href="#"><u>Understanding Geometric Figures Through Drawing and Paper Folding</u></a> – February 6, 2009</p> <p><a href="#"><u>Differentiating Mathematics Instruction</u></a> – May 28, 2008</p> <p><a href="#"><u>Kindergarten Matters: Building Blocks for Learning</u></a> – January 30, 2007</p> <p><a href="#"><u>Learning Mathematics Within Contexts</u></a> – October 30, 2007</p> <p><a href="#"><u>Making Mathematics Accessible to All Students</u></a> – March 29, 2007</p> <p><a href="#"><u>Coaching for Student Success in Mathematics</u></a> – June 28, 2007</p> <p><a href="#"><u>Mathematical Knowledge for Teaching with Dr. Deborah Loewenberg Ball</u></a> – November 2, 2005</p> <p><a href="#"><u>Engaging Students in Mathematics</u></a> – November 2011</p> <p><a href="#"><u>High-yield Strategies for Improving Mathematics Instruction and Student Learning</u></a> – February 2008</p> <p><a href="#"><u>Leadership in Mathematics</u></a> – September 2012</p> <p><a href="#"><u>Snapshots of Effective Practice – Doug Clements: Early Mathematics</u></a> – September 2012</p>
<div style="background-color: #003366; color: white; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">GAP CLOSING</div> <p><b>Professional Learning Support for Gap Closing Resources</b></p>	<p><a href="#"><u>Gap Closing J/I Evidence - November 2012</u></a> Use of Gap Closing Junior/Intermediate resources can close gaps for students and influence teacher practice.</p> <p><a href="#"><u>Gap Closing I/S Evidence - November 2012</u></a> Use of Gap Closing Intermediate/Senior resources can close gaps for students and influence teacher practice.</p> <p><a href="#"><u>Principal as Mathematics Leader</u></a> Perspectives/suggestions from principals actively improving mathematics learning and teaching in Ontario</p>

Mathematics Strategy – PROFESSIONAL LEARNING

Professional Learning	Topic
<p><b>Effective Questioning:</b></p>	<p><a href="#"><u>Strategies using questioning to differentiate instruction at the concept development stage.</u></a></p> <p><a href="#"><u>Adapting an Existing Lesson using an Open Question to Support Split Grades</u></a></p> <p><a href="#"><u>Learning Through Effective Questioning Digital Research Paper (2011)</u></a></p> <p><a href="#"><u>Questioning across the Grades - Halton DSB</u></a></p> <p><a href="#"><u>Questioning focus across subjects and across grades</u></a></p>
<div data-bbox="228 821 418 968" data-label="Image"> </div> <p><b>Professional Learning Supports for Critical Learning Instructional Path Supports (CLIPS):</b></p>	<p><a href="#"><u>Math Clips Evidence</u></a></p> <p><a href="#"><u>School Administrators Want to Know--the benefits of including Math CLIPS in a School Improvement Plan</u></a></p> <p><a href="#"><u>Teachers Want to Know--how use of math CLIPS increases student achievement</u></a></p>

## Mathematics Strategy – PROFESSIONAL LEARNING



Professional Learning	Topic
 <p><b>Student Success</b> <b>DI Series</b></p> <p>Supports for professional learning in the area of Differentiated Instruction.</p>	<p><a href="#"><u>DI Math Guide 2009</u></a></p> <p><a href="#"><u>Facilitator's Guide – DI Based on Readiness</u></a> – MJ Hobbs</p> <p><a href="#"><u>DI Professional Learning Series Facilitator's Guide and Professional Learning Series</u></a></p>
<p><b>Classroom Instructional Strategies</b></p>	<p><a href="#"><u>These resources provide explicit support for planning and delivering various components of effective lessons and programs.</u></a></p>
<p><b>EQAO Research</b></p>   	<p><a href="#"><u>Practical Recipe for Grade 9 Math Success:</u></a> Students do better when they know if test counts</p> <p><a href="#"><u>Factors That are Related to Student Achievement on the EQAO Grade 9 Assessment of Mathematics</u></a></p> <p><a href="#"><u>Counting the EQAO Grade 9 Mathematics Assessment for Course Marks Makes a Difference in Student Results</u></a></p>
<p><b>Financial Literacy Resources</b></p>	<p><a href="#"><u>Elementary Videos</u></a></p> <ul style="list-style-type: none"> <li>• Financial literacy in grade 4 Math and Language</li> <li>• Financial literacy in grade 8 Math and Language</li> <li>• Financial literacy in grade 7/8 Math and Health and Physical Education</li> </ul> <p><a href="#"><u>Secondary Videos</u></a></p> <ul style="list-style-type: none"> <li>• Financial literacy in grade 11 Math(MCR34)</li> <li>• Financial literacy in grade 11 Math(MEL3E)</li> </ul>
<p><b>Kindergarten Numeracy Through the Day Videos</b></p>	<p><a href="#"><u>Making Thinking and Learning Visible</u></a></p>

**Mathematics Strategy – PROFESSIONAL LEARNING**


Professional Learning	Topic
<i>Adobe Connect</i>	<a href="#"><u>Adobe Connect User Guide</u></a>
<i>Coaching</i>	<a href="#"><u>Developing Coaches</u></a>
<i>Innovations By Boards</i>	<a href="#"><u>Collaborative Action Research</u></a> <a href="#"><u>Connecting Classrooms through Technology</u></a> <a href="#"><u>TIPS Influence EQAO Results</u></a> <a href="#"><u>Math Transitions Project</u></a> <a href="#"><u>Other Resources</u></a>
<i>Teaching Through the Mathematical Processes</i>	<a href="#"><u>Videos</u></a>





## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
<div style="text-align: center;">  <p><a href="http://www.mathclips.ca">www.mathclips.ca</a></p> </div> <p><b>Critical Learning Instructional Path Supports (CLIPS):</b>            Research-affirmed web-based interactive learning modules equipped with immediate feedback, interactive tools, games, quizzes, and suggestions for demonstrating learning.</p>	<p><a href="http://www.mathclips.ca">www.mathclips.ca</a></p> <p>Learning activities for</p> <ul style="list-style-type: none"> <li>• Fractions</li> <li>• Integers</li> <li>• Linear Growing Patterns</li> <li>• Trigonometric Functions</li> </ul> <p><a href="#">Other CLIPS resources</a></p>
<div style="text-align: center;">  </div> <p><b>Gap Closing</b> Intervention materials designed for students who need additional support in mathematics accompanied with facilitator guides</p>	<p><b>Facilitator’s Guide and Student Books for :</b></p> <p><a href="#">Gap Closing Junior/Intermediate</a></p> <p>Module 1: Number Sense            Module 2: Comparing Fractions            Module 3: Representing and Renaming Whole Numbers            Module 4: Comparing and Ordering Whole Numbers            Module 5: Multiplying and Dividing            Module 6: Relating Situations to Mathematical Operations            Module 7: Representing and Comparing Decimals            Module 8: Decimal Computation</p> <p><a href="#">Gap Closing Intermediate/Senior</a></p> <p>Module 1: Fractions            Module 2: Decimals            Module 3: Integers            Module 4: Proportional Reasoning            Module 5: Powers and Roots            Module 6: Algebraic Expressions            Module 7: Solving Equations            Module 8: Two-Dimensional Measurement            Module 9: Measurement - Volume</p> <p><a href="#">Other Gap Closing Resources</a></p>


## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
<p><b>ePractice</b></p> <p>Activities are interactive web-based opportunities for students to build confidence in their understanding of concepts and skills. Each activity aligns with a particular Gap Closing lesson.</p>	<p><a href="http://www.ePractice.ca">www.ePractice.ca</a></p>
<p><b>Classroom Dynamics</b></p>	<p>This resource has four components designed to facilitate professional learning in <a href="#">Classroom Dynamics</a>:</p> <ul style="list-style-type: none"> <li>• Checklists</li> <li>• Self-reflection</li> <li>• Working with Critical Friends</li> <li>• Professional Learning Cycles</li> </ul>
<p><b>Classroom Instructional Strategies</b></p>	<p><a href="#">Differentiated Instruction</a></p> <p><a href="#">Manipulatives Management</a></p> <p><a href="#">Fermi Problems</a></p> <p><a href="#">Other Resources</a></p>
 <p><b>Winning Instructional Navigational Supports (WINS) K-8:</b> Student Think Sheets and Facilitator Guides designed to support parents/guardians with helping their child with number sense and operations.</p>	<ul style="list-style-type: none"> <li>• <b>K-1</b> <a href="#">Facilitator's Guide</a> <a href="#">Student Book</a></li> <li>• <b>Grades 2-3</b> <a href="#">Facilitator's Guide</a> <a href="#">Student Book</a></li> <li>• <b>Grades 4-5</b> <a href="#">Facilitator's Guide</a> <a href="#">Student Book</a></li> <li>• <b>Grades 6-7</b> <a href="#">Facilitator's Guide</a> <a href="#">Student Book</a></li> <li>• <b>Grades 7-8</b> <a href="#">Facilitator's Guide</a> <a href="#">Student Book</a></li> </ul>




## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
 <p><b>Support for English Language Learners:</b></p>	<p>School Boards in Ontario are required by the English Language Learners ESL and ELD Programs and Services Policies and Procedures for Ontario Elementary and Secondary Schools, Kindergarten to Grade 12 to provide an initial assessment of the English language learner’s mathematical knowledge and skills. To assist school boards with this initial assessment of mathematics, the Ministry of Education has provided an Initial Assessment of Mathematics – Elementary for students in grades 1 – 8. This assessment is available to all English language school boards on a password protected page on the EduGAINS website.</p> <ul style="list-style-type: none"> <li>• <a href="#">Grades 1-8</a></li> </ul>
 <p><b>DI Teaching Learning Examples Grades 7 - 10</b></p> <p>This repository of professional learning supports includes materials intended for use by facilitated groups, by collaborative teams, and by individuals. Supports take on many formats from multi-session workshops, to video presentations, to print files, to video clips, to interactive web-based instructional trajectories.</p>	<p><a href="#">Grade 7 Mathematics: Data Management</a></p> <p><a href="#">Grade 8 Mathematics: Ratio and Proportion</a></p> <p><a href="#">Grade 9 Mathematics, Applied (MFM 1P): Solving Linear Equations</a></p> <p><a href="#">Grade 10 Mathematics, Applied (MFM2P): Trigonometry</a></p> <p><a href="#">Grade 10 Mathematics, Applied (MFM2P): Introduction to Solving Linear Systems</a></p>

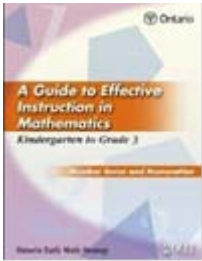

## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
 <p><b>Targeted Implementation and Planning Supports (TIPS 7 – 12):</b> Three-part lessons featuring a variety of instructional strategies to demonstrate effective use of technologies, manipulatives, and literacy strategies to engage students in problem-based learning</p>	<p><a href="#"><u>Templates</u></a></p> <p><a href="#"><u>TIPS 2.0</u></a> Sample lessons using the TIPS template, with associated video or student work samples.</p> <p><a href="#"><u>TIPS4RM (TIPS for Revised Mathematics)</u></a> Three-part lesson plans and supports for Grade 7 through Grade 12, developed by or supported by the Ministry of Education. Grade 7, 8, 9 Applied and 10 Applied are complete courses. The other grades have complete course outlines and selected units have been fully developed. Many of the grades also have summative assessments.</p> <p><a href="#"><u>TIPS for ELL (TIPS for English Language Learners of mathematics)</u></a> Supports, course outlines and selected lessons designed specifically for English Language Learners of mathematics.</p> <p><a href="#"><u>TIPS FI (French Immersion)</u></a> Student worksheets for French Immersion Mathematics classes. All worksheets for the Grade 7 and Grade 8 TIPS courses have been translated into French.* * If the original worksheet contains a picture, the associated French translation appears below the picture.</p> <p><a href="#"><u>TIPS IWB (Interactive White Boards)</u></a> Sample TIPS lessons using interactive whiteboards.</p> <p><a href="#"><u>TIPS PPQ (Posing Powerful Questions)</u></a> TIPS lessons with a focus on effective questioning, using both the TIPS template and the Posing Powerful Questions template.</p> <p><b>Summative Assessments</b></p> <p><a href="#"><u>Grade 7</u></a> <a href="#"><u>Grade 8</u></a> <a href="#"><u>Grade 9 Applied</u></a> <a href="#"><u>Grade 10 Applied</u></a></p>

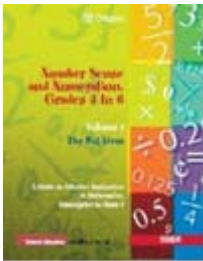
## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
	<p><a href="#"><u>EQAO Supports</u></a></p> <p><i>Sample Questions – Academic</i></p> <p><a href="#"><u>Algebra 1</u></a>  <a href="#"><u>Algebra 2</u></a>  <a href="#"><u>Geometry</u></a>  <a href="#"><u>Linear Relations - winter 2006</u></a>  <a href="#"><u>Linear Relations - spring 2007</u></a>  <a href="#"><u>Linear Relations - spring 2008</u></a>  <a href="#"><u>Linear Relations - winter 2007</u></a>  <a href="#"><u>Linear Relations - winter 2008</u></a>  <a href="#"><u>Measurement</u></a>  <a href="#"><u>Number Sense</u></a>  <a href="#"><u>Academic Formula Sheet</u></a></p>
<p><b>Financial Literacy Lesson Plans</b></p>	<p><a href="#"><u>Elementary Videos</u></a></p> <ul style="list-style-type: none"> <li>• Financial literacy in grade 4 Math and Language</li> <li>• Financial literacy in grade 8 Math and Language</li> <li>• Financial literacy in grade 7/8 Math and Health and Physical Education</li> </ul> <p><a href="#"><u>Secondary Videos</u></a></p> <ul style="list-style-type: none"> <li>• Financial literacy in grade 11 Math(MCR34)</li> <li>• Financial literacy in grade 11 Math(MEL3E)</li> </ul> <p><a href="#"><u>Teaching and Learning Examples</u></a></p> <ul style="list-style-type: none"> <li>• Financial literacy in grade 10 Math(MPM1D)</li> </ul>
	<p><a href="#"><u>OSAPAC</u></a></p> <ul style="list-style-type: none"> <li>• Licensed software available through OSAPAC (e.g. Go Venture Personal Finances, Go Venture Financial Literacy resources CDs and Simulations)</li> </ul>
	<p><a href="#"><u>OERB</u></a></p> <ul style="list-style-type: none"> <li>• The Ontario Educational Resource Bank (OERB) includes a number of financial literacy resources including those developed by 20 subjects/division associations to support financial literacy education. A search of “financiallit” in the key word search will return the subject division lesson plans related to financial literacy.</li> </ul>

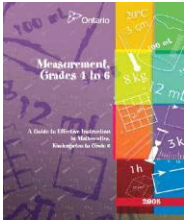
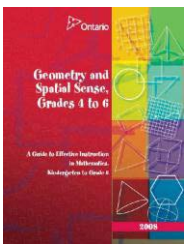
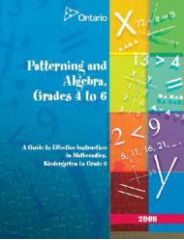
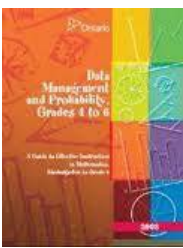
## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
	<p><a href="#"><u><b>A Guide to Effective Instruction in Mathematics, Kindergarten to Grade 3</b></u></a></p> <p>Number Sense and Numeration, 2003</p> <ul style="list-style-type: none"> <li>• The "Big Ideas" in Number Sense and Numeration</li> <li>• Counting</li> <li>• Operational Sense</li> <li>• Quantity</li> <li>• Relationships</li> <li>• Representation</li> <li>• Learning Activities for Number Sense and Numeration</li> </ul>
	<p><i>A Guide to Effective Instruction in Mathematics, Kindergarten to Grade 3</i></p> <p><a href="#"><u><b>Measurement, 2007</b></u></a></p> <ul style="list-style-type: none"> <li>• The "Big Ideas" in Measurement</li> <li>• Attributes, Units, and Measurement Sense</li> <li>• Measurement Relationships</li> <li>• Learning Activities for Measurement</li> </ul> <p><a href="#"><u><b>Geometry and Spatial Sense, 2005</b></u></a></p> <ul style="list-style-type: none"> <li>• The "Big Ideas" in Geometry and Spatial Sense</li> <li>• Properties of Two-Dimensional Shapes and Three-Dimensional Figures</li> <li>• Geometric Relationships</li> <li>• Location and Movement</li> <li>• Learning Activities for Geometry and Spatial Sense</li> </ul> <p><a href="#"><u><b>Patterning and Algebra, 2007</b></u></a></p> <ul style="list-style-type: none"> <li>• The "Big Ideas" in Patterning and Algebra</li> <li>• Patterns and Relationships</li> <li>• Expressions and Equality</li> <li>• Learning Activities for Patterning and Algebra</li> </ul> <p><a href="#"><u><b>Data Management and Probability, 2007</b></u></a></p> <ul style="list-style-type: none"> <li>• The "Big Ideas" in Data Management and Probability</li> <li>• Collection and Organization of Data</li> <li>• Data Relationships</li> <li>• Probability</li> <li>• Learning Activities for Data Management and Probability</li> </ul>

## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
	<p><b><i>Number Sense and Numeration, Grades 4 to 6, 2006</i></b></p> <p><b><u><a href="#">Volume 1</a></u></b>  <b><u><a href="#">The Big Ideas in Number Sense and Numeration</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Quantity</i></li> <li>• <i>Operational Sense</i></li> <li>• <i>Relationships</i></li> <li>• <i>Representation</i></li> <li>• <i>Proportional Reasoning</i></li> </ul> <p><b><u><a href="#">Volume 2</a></u></b>  <b><u><a href="#">Addition and Subtraction</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Relating Mathematics Topics to the Big Ideas</i></li> <li>• <i>Learning About Addition and Subtraction in the Junior Grades</i></li> <li>• <i>Developing Computational Strategies Through Mini-Lessons</i></li> <li>• <i>Learning Activities for Addition and Subtraction</i></li> </ul> <p><b><u><a href="#">Volume 3</a></u></b>  <b><u><a href="#">Multiplication</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Relating Mathematics Topics to the Big Ideas</i></li> <li>• <i>Learning About Multiplication in the Junior Grades</i></li> <li>• <i>Using Mathematical Models to Represent Multiplication</i></li> <li>• <i>Learning Activities for Multiplication</i></li> </ul> <p><b><u><a href="#">Volume 4</a></u></b>  <b><u><a href="#">Division</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Relating Mathematics Topics to the Big Ideas</i></li> <li>• <i>Learning About Division in the Junior Grades</i></li> <li>• <i>Using Mathematical Models to Represent Division</i></li> <li>• <i>Learning Activities for Division</i></li> </ul> <p><b><u><a href="#">Volume 5</a></u></b>  <b><u><a href="#">Fractions</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Relating Mathematics Topics to the Big Ideas</i></li> <li>• <i>Learning About Fractions in the Junior Grades</i></li> <li>• <i>Learning Activities for Fractions</i></li> </ul> <p><b><u><a href="#">Volume 6</a></u></b>  <b><u><a href="#">Decimal Numbers</a></u></b></p> <ul style="list-style-type: none"> <li>• <i>Relating Mathematics Topics to the Big Ideas</i></li> <li>• <i>Learning About Decimals in the Junior Grades</i></li> <li>• <i>Learning Activities for Decimal Numbers</i></li> </ul> <p><b><u><a href="#">Understanding Addition and Subtraction of Whole and Decimal Numbers – Number Sense and Numeration, Grades 4 to 6 (with reference to Volumes 2 and 6) (PTT)</a></u></b></p>

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	<p><a href="#"><u>Understanding Multiplication and Division of Whole and Decimal Numbers – Number Sense and Numeration, Grades 4 to 6 (with reference to Volumes 1, 3, 4, and 6) (PTT)</u></a></p> <p><a href="#"><u>Understanding Relationships Between Fractions, Decimals, Ratios, Rates, and Percents – Number Sense and Numeration, Grades 4 to 6 (with reference to Volumes 1, 5, and 6) (PTT)</u></a></p>
	<p><a href="#"><u>Measurement, Grades 4 to 6, 2008</u></a></p> <ul style="list-style-type: none"> <li>• The “Big Ideas” of Measurement</li> <li>• Attributes, Units, and Measurement Sense</li> <li>• Measurement Relationships</li> <li>• Learning Activities</li> </ul>
	<p><a href="#"><u>Geometry and Spatial Sense, Grades 4 to 6, 2008</u></a></p> <ul style="list-style-type: none"> <li>• The “Big Ideas in Geometry and Spatial Sense</li> <li>• Learning About Two-Dimensional Shapes in the Junior Grades</li> <li>• Learning About Three-Dimensional Figures in the Junior Grades</li> <li>• Learning About Location and Movement in the Junior Grades</li> <li>• Learning Activities</li> </ul>
	<p><a href="#"><u>Patterning and Algebra, Grades 4 to 6</u></a></p> <ul style="list-style-type: none"> <li>• The “Big Ideas” of Patterning and Algebra</li> <li>• Patterns and Relationships</li> <li>• Variables, Expressions and Equations</li> <li>• Learning Activities</li> </ul>
	<p><a href="#"><u>Data Management and Probability, Grades 4 to 6</u></a></p> <ul style="list-style-type: none"> <li>• The “Big Ideas” of Data Management and Probability</li> <li>• Collection and Organization of Data</li> <li>• Data Relationships</li> <li>• Probability</li> <li>• Learning Activities</li> </ul>



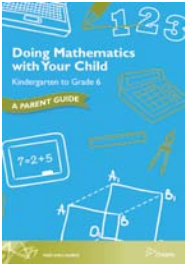


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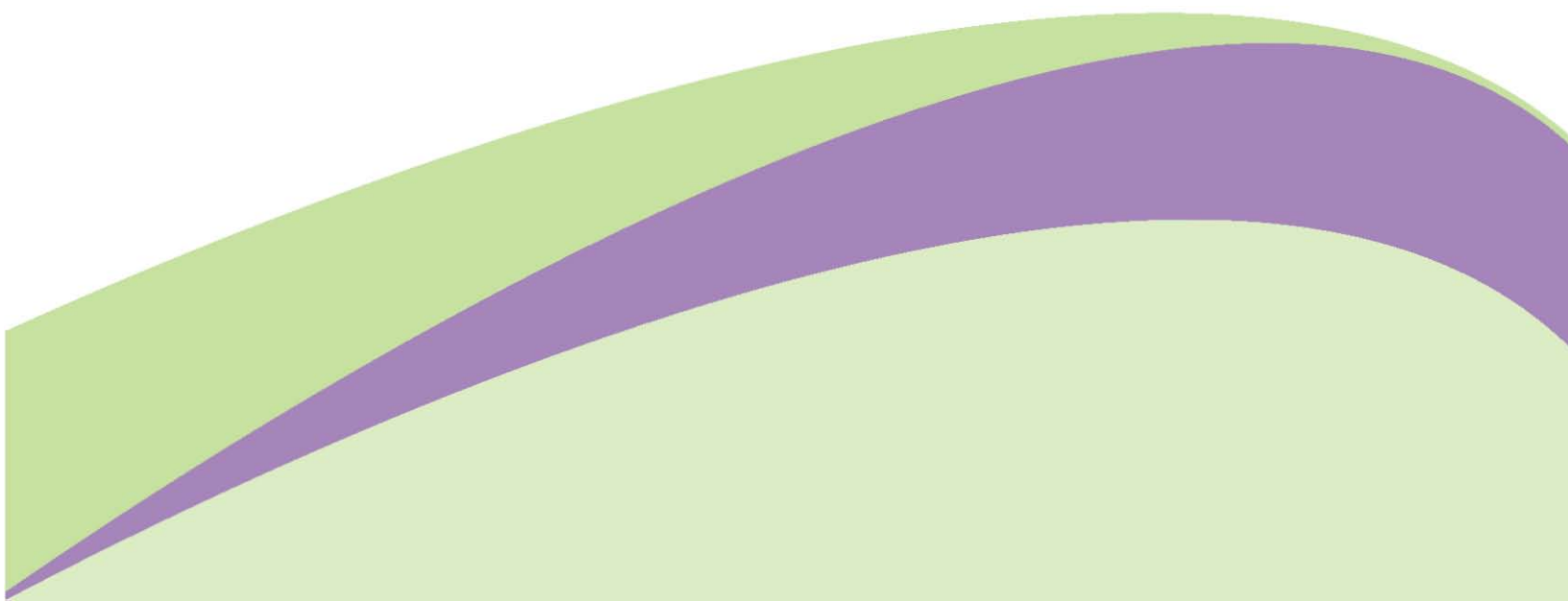
Classroom Resources	Topic
<p><b><i>Continuum and Connections Packages:</i></b> Content-based packages showing connections across grades and across strands, while providing rich questions to develop proficiency that is connected to mathematical processes.</p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Big ideas and Proportional Reasoning K-12</u></a></li> <li>• <a href="#"><u>Fractions</u></a></li> <li>• <a href="#"><u>Integers</u></a></li> <li>• <a href="#"><u>Patterning to Algebra K-3</u></a></li> <li>• <a href="#"><u>Patterning to Algebra 7-12</u></a></li> <li>• <a href="#"><u>Perimeter, Area, Volume</u></a></li> <li>• <a href="#"><u>Proportional Reasoning 7-12</u></a></li> <li>• <a href="#"><u>Solving Equations</u></a></li> </ul>
<p><b><i>Mathematical Processes Resources:</i></b> Resource includes a detailed package with the role of student, instructional strategies, sample questions and feedback for each of the seven mathematical processes, sample lessons, and electronic posters.</p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Adjusted Lessons</u></a></li> <li>• <a href="#"><u>DI Math Process Cards</u></a></li> <li>• <a href="#"><u>Generic Rubrics</u></a></li> <li>• <a href="#"><u>Integrating Assessment and the Math Processes</u></a></li> <li>• <a href="#"><u>Math Process Package</u></a></li> <li>• <a href="#"><u>Posters</u></a></li> </ul>
<p><b><i>Manipulatives Instructional Supports</i></b> Tips and strategies for using manipulatives to build students' understanding of mathematical concepts.</p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Manipulatives Tip Sheets</u></a></li> <li>• <a href="#"><u>Manipulatives Instructional Strategies</u></a></li> </ul>
<p><b><i>Technology Supports:</i></b> Supports for classroom use of Ministry-licensed software and digital resources (e.g., Tinker Plots, Math Gizmos, Geometry Sketchpad)</p>	<ul style="list-style-type: none"> <li>• <a href="#"><u>Applets</u></a></li> <li>• <a href="#"><u>Software Supports</u></a></li> </ul>

## Mathematics Strategy – CLASSROOM RESOURCES

Classroom Resources	Topic
<b><i>Effective Questioning:</i></b>	<p><a href="#"><u>Strategies using questioning to differentiate instruction at the concept development stage.</u></a></p> <p><a href="#"><u>Adapting an Existing Lesson using an Open Question to Support Split Grades</u></a></p> <p><a href="#"><u>Learning Through Effective Questioning Digital Research Paper (2011)</u></a></p> <p><a href="#"><u>Questioning across the Grades - Halton DSB</u></a></p> <p><a href="#"><u>Questioning focus across subjects and across grades</u></a></p>

## Mathematics Strategy – PARENT RESOURCES

Parent Resource	Topic
	<p><b><u><a href="#">Doing Mathematics With Your Child: Kindergarten to Grade 6</a></u></b>            These guides have been developed so that parents, guardians, caregivers and other family members can help our youngest learners further develop their reading, writing and math abilities. They include tips as well as practical activities that can be used at home and in your local community.</p>
	<p><b><u><a href="#">Homework Help (Grades 7-10)</a></u></b>            An effective and efficient way of helping struggling mathematics students. Log-in to the Independent Learning Centre's website from any internet connected computer Sunday to Thursday 5:30 pm to 9:30 pm EST, to receive individualized math help from certified Ontario teachers. Videos of best tutorials and commonly asked questions are available anytime.</p>
	<p><b><u><a href="#">The Power of Ontario's Provincial Testing Program</a></u></b>            This document describes how EQAO's provincial tests, which gather information from every student at key stages of their education, contribute to public accountability and to the continuous improvement on the part of every student in Ontario's publicly funded education system.</p> <p><b><u><a href="#">EQAO TESTS IN ELEMENTARY SCHOOL: A Guide for Parents</a></u></b></p> <p><b><u><a href="#">6 Questions to Ask When Looking at Your School's Results</a></u></b></p> <p><b><u><a href="#">Assessment of Mathematics. Primary Division (Grades 1–3) and Junior Division (Grades 4– 6)</a></u></b>            Access student assessment booklets containing actual questions from the assessments, and scoring guides containing examples of student answers taken from past years' assessments</p> <p><b><u><a href="#">Grade 9 Assessment of Mathematics</a></u></b>            Access student assessment booklets containing actual questions from the assessments and scoring guides containing examples of student answers taken from past years' assessments.</p>



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