

Balanced Mathematics Instruction, K-8



Learning mathematics results in more than a mastery of basic skills. It equips students with a concise and powerful means of communication. Mathematical structures, operations, processes, and language provide students with a framework and tools for reasoning, justifying conclusions, and expressing ideas clearly. Through mathematical activities that are practical and relevant to their lives, students develop mathematical understanding, problem-solving skills, and related technological skills that they can apply in their daily lives and, eventually, in the workplace. (The Ontario Curriculum, Grade 1-8: Mathematics, p. 3)

Building Basic Facts and Operational Skills	Purposeful Practice	Teaching Through Problem Solving	Variety of Instructional Practices	Intentional Use of Resources
<p>Basic facts and operational skills are important to help students become more efficient when reasoning and proving in problem solving.</p> <p>Teachers extend instant recall and math drills to involve understanding of why an operation works and how it relates to key concepts.</p> <p>Mental math activities are infused into daily instruction.</p> <p>Emphasis is placed on helping students to understand relationships and patterns within basic facts.</p> <p><i>“Research indicates that students’ computational sense is improved by exposure to a range of computational strategies through guided instruction by the teacher and shared learning opportunities with other students.” (A Guide to Effective Instruction in Mathematics, K-6, Vol. 5, p.14)</i></p>	<p>Students are given multiple opportunities to practice concepts and skills they are learning.</p> <p><i>It is important that students have opportunities to learn in a variety of ways-individually, cooperatively, independently, with teacher direction, through hands-on experience, through examples followed by practice. (The Ontario Curriculum, Grade 1-8: Mathematics, p. 24)</i></p> <p>Practice occurs both in class and at home and uses co-constructed success criteria to connect to in-class instruction.</p> <p>Practice is differentiated based on students’ needs.</p> <p>Practice may include basic facts, mental math, problem solving, games and activities.</p> <p><i>“Using problems to introduce, practice, and consolidate basic facts is one of the most effective strategies for helping students link the mathematical concepts to the abstract procedures.” (A Guide to Effective Instruction in Mathematics, K-6, Vol. 5, p.7)</i></p>	<p>Teaching through problem solving is different than teaching students how to solve a problem. It is teaching key mathematical concepts by having students investigate carefully selected, multiple entry point problems that can be solved in a variety of ways.</p> <p>In consolidation, teachers highlight concepts and strategies to build mathematical understanding. They co-construct learning goals and success criteria that students use to practice.</p> <p>The 3-part Problem solving lesson structure helps teachers teach through problem solving.</p> <ol style="list-style-type: none"> 1. Before: Activate students’ mathematical knowledge and experience. 2. During: Students work on the lesson problem using self-selected strategies. 3. a) After (Consolidation) – selection of solutions are used for class discussion and co-construction of success criteria. b) After (Practice) – similar to lesson problem, worked on independently. 	<p>Teachers use their informed professional judgment to design mathematics instruction that addresses the needs of their students and supports them in achieving the <i>Ontario Math Curriculum Expectations</i>.</p> <p><i>“When developing their mathematics program and units of study from this document, teachers are expected to weave together related expectations from different strands, as well as the relevant mathematical process expectations, in order to create an overall program that integrates and balances concept development, skill acquisition, the use of processes, and applications.” (The Ontario Curriculum, Grade 1-8: Mathematics, p. 7)</i></p> <p>Teachers:</p> <ul style="list-style-type: none"> - use flexible and divergent ability groupings to differentiate instruction. - create a culture of positive norms in the classroom. - ask effective questions to develop critical thinking skills. - provide ongoing, descriptive feedback that is clear, specific, meaningful and timely to support learning and achievement. - offer assessment opportunities that monitor students’ progress and needs. 	<p><i>“Teachers use practices and procedures that are carefully planned to relate to the curriculum expectations and learning goals and, as much as possible, to the interests, learning styles and preferences, needs, and experiences of all students.” (Growing Success, 2010, p. 6)</i></p> <p>Teachers begin with the curriculum in mind before selecting resources to help address specific and overall expectations.</p> <p>Teachers use a variety of resources to provide rich and meaningful learning opportunities.</p> <p>Resources may include professional readings, textbooks, manipulatives, technology and media that help teachers to plan and deliver a balanced and effective mathematics program.</p> <p>Teachers intentionally select resources and tools that are responsive to students’ learning needs and interests.</p>

