

## DRAFT - Subject to Change

The items for consideration listed below are the product of a two-day forum and are not intended to represent a comprehensive set of actions to increase the effectiveness of mathematics teaching and learning, nor are the considerations in any particular order.

### **Key Considerations for Improvement**

The FORUM FOR ACTION was a rich learning opportunity for all involved, fostering much interest in further dialogue and some common ground as well about the most promising next steps for Ontario mathematics education. These points of convergence have been culled from researcher presentations and school and board discussions, as follows (in no particular order of importance):

1. We need to continue to work together – the Ministry of Education, school districts, faculties of education and teachers –in acquiring deeper content knowledge of mathematics and improved pedagogical knowledge and skill.
2. Increasing teachers' deep content knowledge in conjunction with their pedagogical knowledge will require knowledgeable and skillful facilitators working with them -- hands-on – in school and classroom settings.
3. School districts require multiple approaches to sharing promising practices – both within and across schools – for intervening with students who are struggling in mathematics.
4. A team approach – where teachers plan, learn and teach together – is vital for improving mathematics teaching and learning on a wide scale.
5. Teaching mathematics effectively requires a range of strategies, including the purposeful design of lessons, a careful sequencing of student activities and appropriate interventions and scaffolds for student learning. It also requires knowing students well to work with the strengths, needs and interests they bring to school.
6. Improving mathematics outcomes requires building the confidence of both teachers and students in their ability to go deeper into learning mathematics.
7. Spatial reasoning is an important predictor among early learners of later success in mathematics – visual representations are essential for developing spatial reasoning and supporting growth in student understanding of mathematical concepts.

8. Manipulatives that help illustrate mathematical functions and computations are excellent and appropriate tools for all student learning K–12 and for teacher and administrator learning as well. When manipulatives are used regularly, they help learners move from a concrete understanding to a more abstract one and back again.
9. Many students with learning difficulties benefit especially from sustained use of manipulatives along with precise instruction that meets their individual learning needs.
10. An area for continued research and development is the use of technology in mathematics. Technology can be helpful for many students who have specific learning difficulties and its use for all students needs to be explored.
11. Quality early learning in mathematics is essential as a foundation. We need to become systematic about quality early years experiences in mathematics.
12. Staffing is an important variable and strategic staffing – placing the highest skilled teachers where needs are greatest – has proven to be valuable in improvement efforts.
13. Mathematics programming needs to involve time for the development of procedural fluency complemented by building strong conceptual understandings.

