Developing Mathematical Mindsets

Math Processes

Ontario's math curriculum not only includes *what* students learn in each grade, but *how* math is used and understood. The seven mathematical processes are used across all grades to help students become better problem solvers, thinkers, and communicators. Here's what they are and how they help students understand math:

Problem Solving

Problem solving is all about tackling new math problems, helping students gain confidence and enjoy exploring different ways to find solutions.

Reasoning and Proving

This involves students explaining why an answer is correct. By justifying their thinking, they gain a deeper understanding of math concepts.

Reflecting

Students think about their own approach to a problem and learn from both successes and mistakes. Reflecting on their methods helps them grow as math learners.

Connecting

Students learn to link what they know in math to other topics and to real-life situations. This makes math more meaningful and shows its usefulness outside the classroom.

Communicating

Students learn to express their math ideas clearly and listen to others' explanations. This strengthens their understanding and helps them learn from different perspectives.

Representing

This involves showing math ideas using tools, drawings, or symbols. Different ways of representing math help students grasp concepts and communicate their thinking.

Selecting Tools and Strategies

Here, students learn to choose the right tools (like calculators, hands-on manipulatives or diagrams) and strategies for each problem. This flexibility builds problem-solving skills they can use throughout their lives.

These processes work together to help students think critically, communicate effectively, and see math as a valuable tool they can use every day.

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Try This At Home!

These problems can be done with your child to encourage the use of the math processes.

Kindergarten to Grade 2
Reasoning and Proving

An ant walked all the way around the outside of a cracker. How far did it walk?

Some prompts you could use are:
Is that a long way for an ant? How do you know?
Can we measure it using something else to compare? How many Cheerios fit around the outside of the cracker?

Source: OTFFEO

Grade 3 to Grade 6
Representing

The population of Campbellford was reported as 3 372 in 2021. Describe or sketch three ways to model this population using different models (eg., base ten blocks, expanded form, addition, number line).

A great resource for virtual manipulatives is Polypad.

Grade 7 to Grade 10
Problem Solving/Selecting Tools and Strategies

Four students participate as a team in a 1000 m wacky relay race. In a wacky relay race, the students each run a portion of the 1000 m length, but they do not run equal lengths. Andrea and Billie run 1/8 and 1/5 of the total length, respectively. Carol runs the average of what Andrea and Billie run. Dana runs the remainder of the length. Determine the fraction of the total length that Dana runs.

Source: CEMC

Knowledgehook At Home

Knowledgehook is used in PVNC Catholic classrooms. This online math tool is designed for both in-class and at-home use. Students engage with interactive, curriculum-aligned math questions assigned by their teachers, in the classroom and beyond. After school, students can access additional questions at their grade level to practice and enhance their math skills. As students respond to questions, teachers receive real-time feedback on their performance, are promptly notified if a student is struggling, and are provided with strategies to assist them in specific areas of difficulty. To support math practice at home, connect with your child's educator(s) to request an invitation to join Knowledgehook.