

What do we mean by *Problem Solving*?

Problem Solving is the process of thinking about and using prior knowledge, experience, skills, and understanding in familiar and new situations in order to complete tasks, make decisions, or achieve goals.

Problem Solving:

- increases opportunities for the use of planning, processing, critical/creative thinking skills (e.g., estimating, classifying, assuming, recognizing relationships, hypothesizing, offering opinions with reasons, evaluating results, and making judgements)
Ontario Math Curriculum, Grades 1 – 8 (2005) & Ontario Mathematics Curriculum, Grades 9 & 10 (2005)
- connects with the inquiry process: Students use the components of the inquiry process to investigate, and to communicate their findings about, significant events, developments, and issues. By applying the inquiry process, students develop skills that they need in order to think critically, solve problems, make informed judgements, and communicate ideas.
Ontario Social Studies, History and Geography Curriculum, Grades 1 -8 (2013) & Ontario Canadian and World Studies Curriculum, Grades 9 & 10 (2013)
- uses strategies to engage students to make connections between the process and the content as they work toward a thorough understanding of mathematics.
Paying Attention to Mathematics: Seven Foundational Principles for Improvement in Mathematics, K-12, (2011)

Examples:

Two circles have different diameters.

Option 1: Can they have the same area? Option 2: Can they have same circumference?

More Good Questions: Great Ways to Differentiate Secondary Mathematics Instruction, Marian Small & Amy Lin, 2010

You add two numbers that are almost 30 apart. The answer is almost 90. What might the numbers be?

Good Questions: Great Ways to Differentiate Mathematics Instruction, Second Edition, Marian Small, 2012

Merge critical literacy and higher-order thinking skills in the form of creative problem-solving by giving students mathematical story problems in which they are asked to find solutions from multiple perspectives.

What Works Monograph: Promoting Critical Literacy across the Curriculum and Fostering Safer Learning Environments, LNS, 2013

Resources:

Ontario Mathematics Curriculum, Grades 1 – 8 (2005)

<http://www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf>

Ontario Mathematics Curriculum, Grades 9 & 10 (2005)

<http://www.edu.gov.on.ca/eng/curriculum/secondary/math910curr.pdf>

Ontario Social Studies, History and Geography Curriculum, Grades 1 -8 (2013)

<http://www.edu.gov.on.ca/eng/curriculum/elementary/sshg18curr2013.pdf>

Ontario Canadian and World Studies Curriculum, Grades 9 & 10 (2013)

<http://www.edu.gov.on.ca/eng/curriculum/secondary/canworld910curr2013.pdf>

Paying Attention to Mathematics: Seven Foundational Principles for Improvement in Mathematics, K-12, (2011)

<http://www.edu.gov.on.ca/eng/teachers/studentssuccess/foundationprincipals.pdf>

What Works Monograph: Promoting Critical Literacy across the Curriculum and Fostering Safer Learning Environments, LNS, (2013)

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WW_PromotingCriticalLiteracy.pdf

A Guide to Effective Instruction in Mathematics, Volume 2: Problem Solving and Communication, Kindergarten to Grade 6

http://eworkshop.on.ca/edu/resources/guides/Guide_Math_K_6_Volume_2.pdf

Marian Small & Amy Lin, More Good Questions: Great Ways to Differentiate Secondary Mathematics Instruction, (2010)

Marian Small, Good Questions: Great Ways to Differentiate Mathematics Instruction, (2012)

Learning For All, A Guide to Effective Assessment and Instructions for All Students Kindergarten to Grade 12, (2013)

<http://www.edu.gov.on.ca/eng/general/elemsec/speced/LearningforAll2013.pdf>