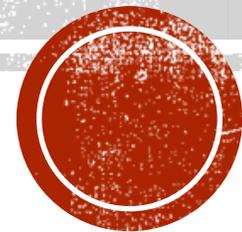


USING THE ONTARIO MATH CURRICULUM WITH AN INQUIRY APPROACH

Marian Small

May 2017



PART OF THE ISSUE

- **What is the Ontario curriculum anyway?**



PART OF THE ISSUE

- Process expectations vs content expectations



PART OF THE ISSUE

- Relative importance of the expectations within a set



PART OF THE ISSUE

- **Deconstructing expectations**



FOR EXAMPLE

- What is the important math to bring out in these expectations from Grade 4?



- demonstrate and explain the relationship between equivalent fractions, using concrete materials (e.g., fraction circles, fraction strips, pattern blocks) and drawings



WHAT IS PRETTY IMPORTANT

- Is to engage in choosing what expectations are worth going back to repeatedly and what the expectations actually mean before making teaching decisions.



NO DOUBT

- Part of this discussion is about why we do math.
- Is it primarily for knowledge and application to real life?
- Is it primarily for understanding and thinking?



INQUIRY

- What could inquiry in math look like?
- It could be inquiry into the world using math.
- It could be purely math inquiry.
- We can and should consider both.



INQUIRY USING MATH

- People talk about things called giant steps and things called baby steps.
- How “big” or “long” do you think a giant step or baby step is?
- How many baby steps would make a giant step?



MATHEMATICALLY

- This leads to students realizing that a measurement value is big for one of two reasons (or both).
- The unit used is small **AND/OR** the object being measured is big.



WHERE ELSE DOES THIS LEAD

- Kids could investigate:
- Sizes of different animal's footprints vs pawprints
- “ratio” of hand size to foot size for people and various animals



BUT THEN THERE ARE MATHEMATICAL INQUIRIES

- We can pose all kinds of things kids could inquire about in math.
- Some might come to you as you watch them play, but some will be more deliberately selected to bring some ideas to kids' attention.



FOR EXAMPLE

- Kids in K might be playing on a walk-on number line.
- You could ask them for different ways to get to, e.g. 10.
- Or you could pose a problem like this:



A PROBLEM

- You were standing on the number line at 5.
- You went forward some and then back some and you ended up at 7.
- How far forward and back MIGHT you have gone?



ANOTHER INVESTIGATION

- You notice kids are playing with square tiles making designs.
- You could take it to this problem.



PROBLEM

- You made a design that had **ALMOST** half red tiles.
- What could it look like?
- OR



PROBLEM

- You had some red tiles.
- You had one more blue tile than red.
- You had two more greens than blues.
- How many tiles could you have used?



ANOTHER SITUATION

- Kids might be adding and subtracting numbers and you might ask any of these questions:



ADDITION & SUBTRACTION-INQUIRY 1

- You choose two numbers.
- The answer when you add is twice as much as the answer when you subtract.
- What could they be?
- What do you notice?



MAYBE IT'S ABOUT FRACTIONS

- You might notice that $2/3 > 1/5$ and that 2 and 3 are closer together than 1 and 5.
- So the inquiry focuses on--- If the numerator and denominator are closer together, is the fraction always greater?



YOU MIGHT WONDER

- Is it possible to show the same amount of money with 8 coins as with 20 coins?
- How?



YOU MIGHT WONDER

- A rectangle has a perimeter 3 times its length.
- What could the length and width be?



DIFFERENTIATION

- Many of my examples were open questions.
- I would propose that these are **ESSENTIAL** for appropriately differentiating instruction.



GRADE 1 OR 2

- What is $12 - 9$? vs.
- You subtract two numbers and the answer is 3. What could the numbers be?
OR



GRADE 1 OR 2

- What is $12 - 9$? vs.
- You subtract two numbers and the answer is 3. What could the numbers be?
OR



GRADE 1 OR 2

- Continue this pattern.



- vs.
- The tenth shape in a pattern is a square. Make a bunch of possible patterns.



GRADE 2 OR 3

- What is $32 + 59$? vs.
- Without adding, how do you know that $32 + 59$ is less than 100?



GRADE 2 OR 3

- Show me 48 using base ten blocks.
- vs.
- A number can be represented using exactly 12 base ten blocks.
- What could it be?



GRADE 3 OR 4

- Which is greater: $\frac{3}{4}$ or $\frac{2}{3}$?
- vs.
- A fraction is **JUST A BIT** more than $\frac{1}{2}$.
What could it be?



GRADE 4 OR 5

- What is $34.2 + 15.7$?
- vs.
- Two decimal numbers are **NOT THAT FAR** apart. Their sum is 95.1.
- What could they be?



GRADE 5 OR 6

- What is 32×22 ? vs
- How do you know that 32×22 is between 600 and 1200 without getting the answer? Explain.



GRADE 6

- Estimate 75% of 158. vs.
- Could 75% of a number be about 100 more than 10% of that same number?



DOWNLOAD

- www.onetwoinfinity.ca
- Recent presentations
- HongKongDay 1 Mini

