
Numeracy Routines - Why, What, How

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Riverdale Elementary

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What are Number Routines?

Number routines are a collection of easy to prep, 5 to 10 minute routines that you can use daily as warm-ups, mini lessons, with the whole class or in small groups. They focus on the big ideas in Mathematics.

Why Use Numeracy Routines?

- Builds a Math community where students feel safe to take risks and can learn from one and other
- Emphasizes the core and curricular competencies in relation to mathematical content.
- Provides opportunities for students to clarify their thinking, consider strategies, and build a repertoire of efficient strategies
- Provides daily number sense experiences that assist students in developing mental math skills and computational fluency
- Allows for spiralling through concepts and helps students make connections to the big ideas in mathematics

Which Curricular Competencies Are Developed?

Reasoning and Analyzing

- estimate reasonably
- develop mental math strategies and abilities to make sense of quantities

Understanding and Solving

- use multiple strategies to engage in problem solving

Communicating and Representing

- communicate in many ways including orally, concretely, pictorially, symbolically

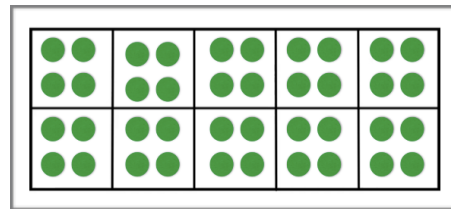
Connecting and Reflecting

- visualize and describe mathematical concepts
- connect mathematical concepts to each other
- share and reflect upon mathematical thinking

Using Number Routines to Develop Number Sense

Quick Image Number Talks:

Quick Image number talks involve pictures of quantities, usually organized in a particular way to encourage students to subitize and/or use spatial sense of quantities. The teacher shows the image for a few seconds and then asks “How many _____?” It is important not to show the images for more than a few seconds, as doing so provides opportunity for students to count by ones. Students must mentally structure the amounts in efficient ways.



Next the teacher facilitates the discussion asking “How did you see them?” Teachers can help students to link the pictorial and symbolic representation of the quantities by recording how the student saw the quantities and using descriptions including numerals and equations.

CONTENT that can be explored includes:

- Perceptual and Conceptual Subitizing
- Estimation
- Counting - one-to-one correspondence, cardinality, counting sequence, skip counting
- Place Value
- Numbers - quantity, number language (the words we use to say how many things there are), numeration (how we write how many things there are)
- Decomposing and Recomposing
- Additive and Multiplicative thinking



*Students with **Number Sense** have “... good intuition about numbers and their relationships. It develops gradually and as a result of exploring numbers, visualizing them in a variety of contexts, and relating them in ways that are not limited to traditional algorithms.”*

- Howden (1989)

Items that can be used:

- Dot cards - <https://startingwiththebeginning.wordpress.com/big-results-in-a-small-amount-of-time/> or chart paper with dots
- Dominos
- Dice
- Pie Plate with magnets
- Five frames, Ten Frames, and Double Ten Frames
- Rekenreks

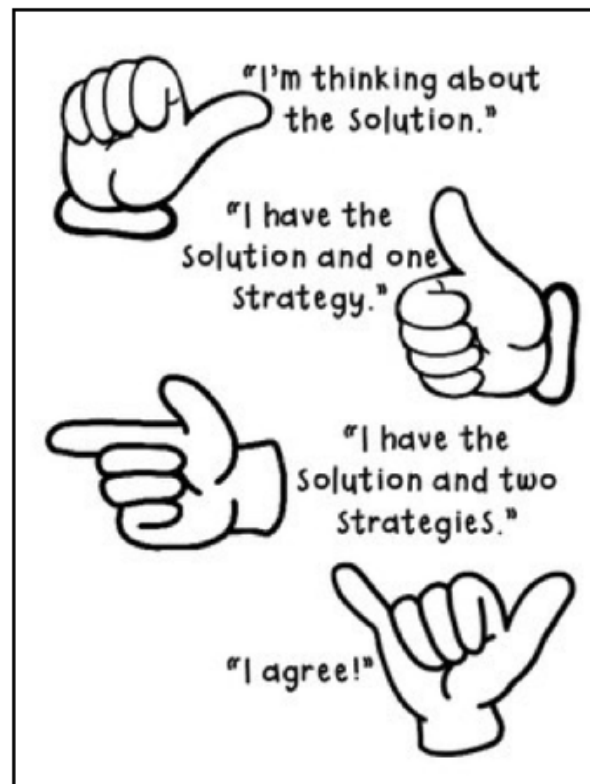
- Hundreds Boards made up by ten frames - <https://startingwiththebeginning.files.wordpress.com/2016/05/quick-image-100-ten-frames.pdf>
- Playing Cards enlarged with numerals removed - my site
- Greg Tang books
- Real life images of groups of items (arrays)
- <http://ntimages.weebly.com/> This site has dot images and real life pictures .
- Money

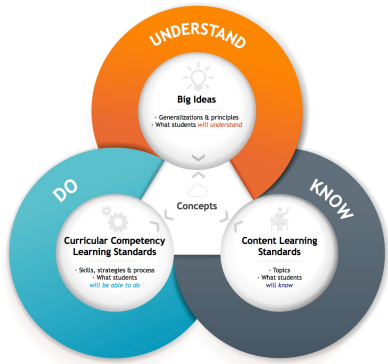
For Virtual Apps that you can Screenshot on your computer: <https://www.mathlearningcenter.org/resources/apps>

Guiding Questions:

- How many do you see?
- How do you see them?
- Does anyone see them differently?
- Is there a number sentence/equation we could write that represents _____'s thinking?
- How is _____'s strategy and _____'s strategy similar or different?

Secret Signals
or Thinking Thumbs





Communicating Student Learning

<p>What COMPETENCIES are you wanting to focusing on?</p>	<p>What CONTENT is the focus?</p>
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Try to write a **LEARNING STANDARD** using what you wrote above:
 (e.g., Students will be able to describe and explain their thinking, using math vocabulary (hundreds, tens, ones) in relation to quantities to 1000)

How could I assess this?

Math Talk Moves



Revoicing

"So you're saying that _____.
Do I have that right?"



Repeating

"Can you restate or rephrase
what _____ just said?"



Reasoning

"Do you agree or disagree,
and why?"



Adding On

"Would someone like to add on?"



Waiting

"Take your time...we'll wait..."



Turn & Talk

"Partner turn and talk
or think-pair-share"

Summary Tables of Productive Talk Moves from *Classroom Discussions in Math: A Teacher's Guide for Using Talk Moves to Support the Common Core and More*, Grades K-6 by Suzanne H. Chapin, Catherine O'Connor, and Nancy Caravan Anderson. Copyright © 2013 by Scholastic Inc. All rights reserved. Item # 594882.



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