
Number Routines in K -3

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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 Number Routines:

- Builds a Math community where students feel safe to take risks and can learn from one and other
- Provides daily number sense experiences
- Fosters discussions about numbers and their relationships
- Responsive to students' understandings
- Allows for spiraling through concepts and helps students make connections to the big ideas in mathematics
- Emphasizes the core and curricular competencies in relation to mathematical content.

What are the BIG Mathematical Ideas in Primary:

SUBITIZING
PLACE VALUE
PATTERNING
SPATIAL AWARENESS

COUNTING
DECOMPOSING
ESTIMATION

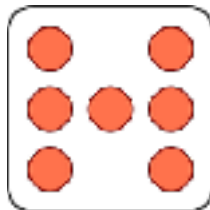
Download four page documents about the big ideas written by Sandra Ball and Janice Novakowski from http://janicenovkam.typepad.com/reggioinspired_mathematic/instructional-resources.html

SUBITIZING:

Quick Images

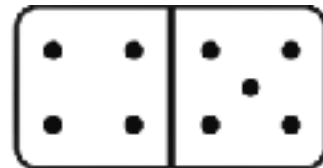
Potential learning intentions:

- Subitizing
- Visualization
- Decomposing and Recomposing
- Mental Math Strategies



Items you could use:

- 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>
- Part Part Whole Cards to 10 http://www5.sd71.bc.ca/math/uploads/lessons_activities/grade1/Number/ppwcards.pdf
- Part Part Whole Cards 10 – 20 http://www5.sd71.bc.ca/math/uploads/lessons_activities/grade1/Number/part%20part%20whole%20cards%2010%20to%2018_part1.pdf
- Canadian Money Part Part Whole Cards
- http://www5.sd71.bc.ca/math/uploads/lessons_activities/grade3/part%20part%20whole%20money.pdf
- Playing Cards enlarged with numerals removed
- Greg Tang books
- Real life images of groups of items (arrays)



Flash and say the number orally / Flash and show on your fingers / Flash and build with manipulatives.

Guiding Questions:

How many do you see?

How do you see them?

Does anyone see them differently?

Teeter Totter - which is more?

COUNTING

Counting Collections:

Potential learning intentions:

Number concepts including:

- Subitizing
- Stable order count
- Cardinality
- One-to-one correspondence
- Magnitude - Relative size of numbers
- Counting forward
- Counting On
- Skip Counting
- Place Value
- Connecting Repeated Addition to Multiplication



Items you can use

- Anything - dollar store items - math manipulatives
- Build kits (10 – 20), (21 – 50), (51 – 100), (100 - 200)

Choral Counting:

Potential learning intentions:

- Number symbol relationship
- Forward and backward number sequence
- Base Ten Understanding
- Patterning/Skip Counting

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Ways to count:

- Count by 1's, 2's, 5's, 10's etc., starting at 1 and at other numbers
- Counting Backwards
- Counting Forwards
- Skip Counting
- Stop and Start Counting, e.g.:
 - Start at 12 and stop at 18 (practice the tricky teens)
 - Start at 57 and stop at 72 (practice getting over the decades)

Note: It is recommended that the teacher write the numbers on the board in an intentional way to elicit the ability for the students to see patterns.

Counting Around The Circle

Whole class activity: Each person says a number around the circle. Or it could be done in a small group – counting around the table.



Set expectations:

- Everyone needs to listen to others and count in their heads
- Everyone needs time to think and apply strategies

Guiding Questions:

Estimate at the beginning – “If we start at ____ what number do you think our last friend will say?”

Reflecting - Looking at the written numbers that we just counted - “Does anyone see any patterns?”

Knock-down

Pick a target number (e.g., 10). Everyone stands up. First student says “one”, next “two” until one student says the target number. That student turns to the student beside them and pretends to knock them down. The student must sit. Play continues until only one child is left standing.

***To differentiate and add more challenge allow each student to choose whether or not to say one, two, or even three numbers. Watch which children use strategies to knock down their peers.

Number Lines:

Number lines should not be up high. They should be down low for students to touch. Number lines are not simply for counting. It's about understanding quantity, magnitude of numbers and number sense.

Guiding Questions:

Where do ____ and ____ belong?

How do you know? Explain your thinking?

How would you solve “equation” (e.g., $67 - 38 =$) using the number line? Would you start at 38 and count forward? Or would you start at 67 and count back?

Today's Number:

Select a number and state this is “Today's Number”. Using either white boards, paper, loose materials or whatever you choose to provide your students, ask them “Show me all the different ways you can make Today's Number”. Highlight different ways that the students use, including: expanded notation, tally marks, using a pattern (e.g., $15 + 1 =$

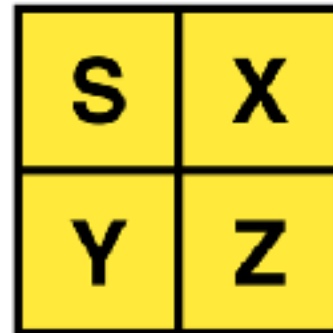
16, $14 + 2 = 16$), using three addends, the commutative property, etc. To encourage students to use strategies shared by their friends, do the same number two days in a row.

Which One Doesn't Belong:

The potential learning intentions:

- Focuses attention on attributes
- Engages students in problem solving
- Encourages using Mathematical vocabulary
- Spatial Awareness

Show the image and let the students discuss.



Guiding Questions:

What do you notice?

What makes all the items alike?

What makes them different?

Which one doesn't belong?

Can you share your reasoning to justify your answer?

DECOMPOSING:

SNAP with Ten Trains:

The potential learning intentions:

- Subtilizing
- Decomposing
- Mental Math
- Computational Fluency
- Commutative Property



Teacher determines the target number. Each student builds their train using the specified number of cubes. Together the students orally call out “One, two, three... SNAP” and then breaks their train in two behind their backs. They then show their partner one of the pieces. The partner guess how many are hidden. Then the hidden piece is brought forward so that the partner to check and see if they were correct. Play continues with the same trains and students take turns with a partner.

Guiding Questions:

How many do you see?

How many are hidden?

How do you know?

How many different ways did you discover that the train could be broken in two?

(Provide paper or whiteboards)

Missing Part Cards:

$$7 = \begin{array}{c} \bullet \bullet \\ \bullet \bullet \end{array} + \square$$

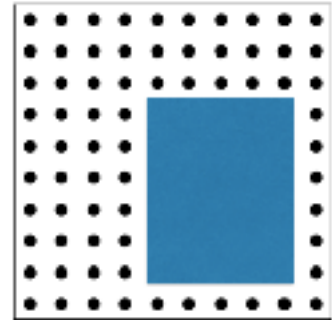
The potential learning intentions:

- Develop multiple strategies for Decomposing
- Decomposing
- Introduction to Algebra
- Commutative Property
- Computational Fluency
- Place Value
- Mental Math

Guiding Questions:

What is missing?

How do you know?



Number Talks:

The potential learning intentions:

- Develop multiple strategies (Mental Math) for Decomposing
- Develop the ability to compute with flexibility, accuracy and efficiency

10 - 15 minutes of focussed discussion on either one question or a “string” of questions designed to elicit a particular strategy (e.g., doubles plus one)

Guiding Questions:

What answers did you get?

Who would like to defend their answers?

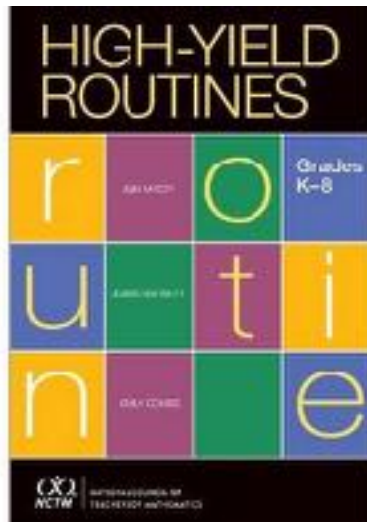
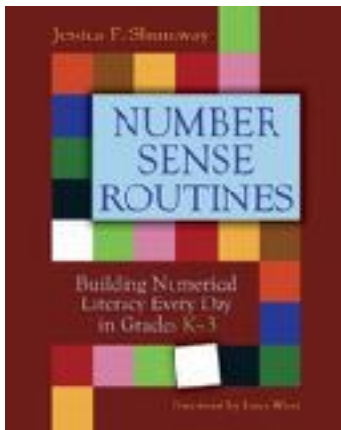
What strategies did you use?

Did anyone think about this problem in a different way?

Note: All of the ideas I have shared with you have been gathered from multiple sources including:

- Daily Math Investigations by Sandra Ball and Carole Fullerton
- Various Number Routines - <http://visiblethinking.weebly.com/daily-routines.html>
- Teacher Education by Design tedd.org
- Sandra Ball - <https://startingwiththebeginning.wordpress.com/big-results-in-a-small-amount-of-time/>
- Janice Novakowski - <http://blogs.sd38.bc.ca/sd38mathandscience/> and http://janicenovkam.typepad.com/reggioinspired_mathematic/instructional-resources.html
- High Yield Routines Grades K - 8 by Ann McCoy, Joann Barnett, and Emily Combs
- Number Sense Routines: Building Numerical Literacy Every Day in Grades K – 3 by Jessica Shumway

- Number Talks by Sherry Parrish
- Which One Doesn't Belong By Christopher Danielson <http://wodb.ca/index.html>



NOTES:

