



Math in Focus: Singapore Math National Institute
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Year 2 & 3: Strategies on Building Capacity

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SUCCESSFACTORS



MATERIALS

A good set of materials and proper tools to get the job done.

PROFESSIONAL LEARNING

Both Internal and External professional development .

VISION

Leadership needs to have a vision.



The Leadership

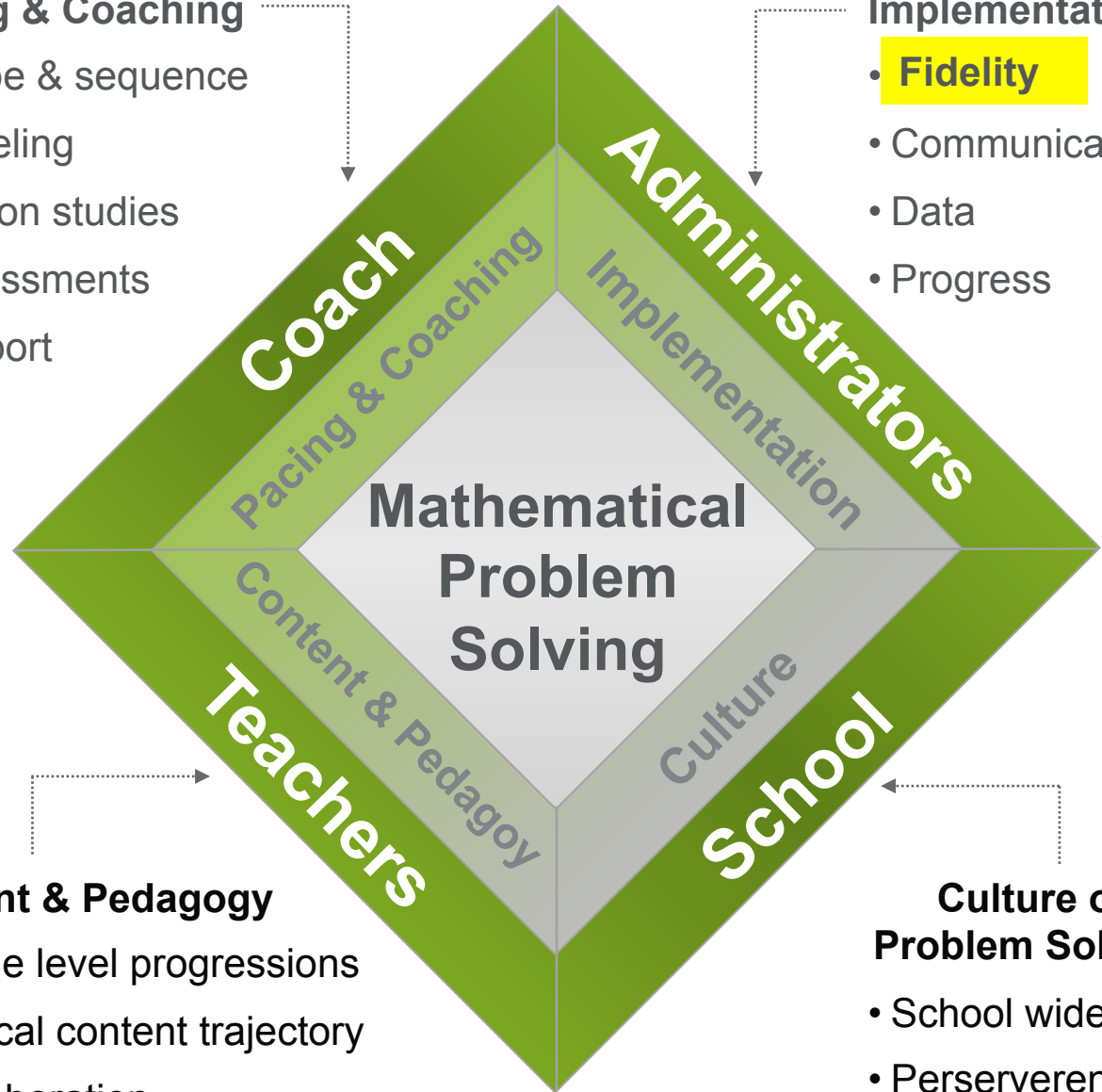
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Pacing & Coaching

- Scope & sequence
- Modeling
- Lesson studies
- Assessments
- Support

Implementation

- **Fidelity**
- Communication
- Data
- Progress



Content & Pedagogy

- Grade level progressions
- Vertical content trajectory
- Collaboration
- Professional Development

Culture of Problem Solving

- School wide
- Persistence
- Parents

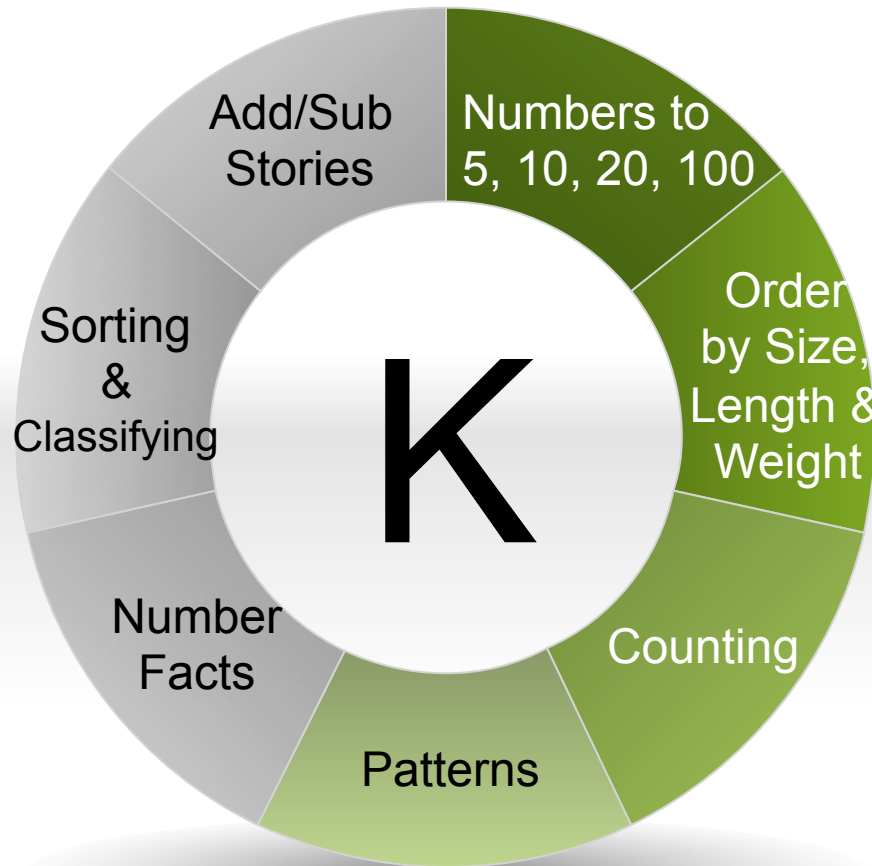
Grade: Kindergarten

Big Ideas

- Counting up to 5 objects is the most basic form of numerical capability.
- “Same and Different” concepts lead to sorting and classifying.

Manipulatives

- Connecting cubes
- Ten Frames
- Cuisenaire rods
- Number line
- Hundred chart



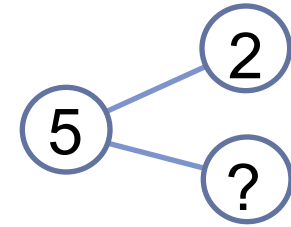
Subitizing

- Counting strategies and techniques.

Math Talk

- Practices that promote mathematical thinking.
- Talking and proving ideas.

Grade: First

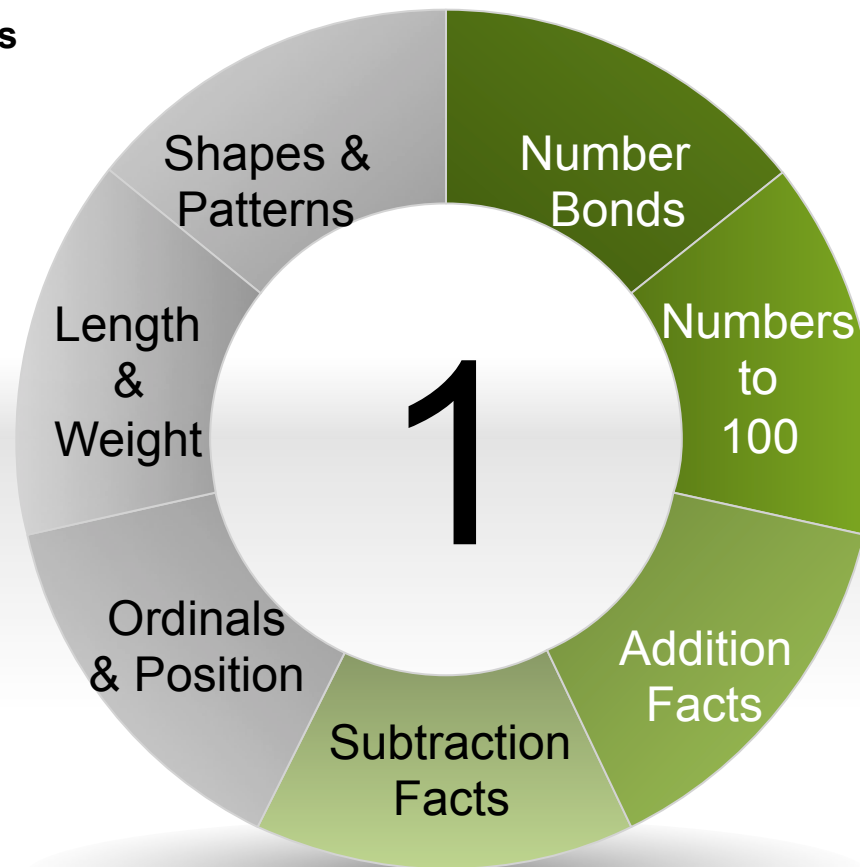


Where Mastery Begins

- Grade 1 is where mastery begins.
- Teachers need to be encouraged to go slow and deep.

Manipulatives

- Students need access to connecting cubes at all times.
- Consider creating Number Bond flash cards to practice facts.
- Base Ten Blocks



Number Bonds

- Center of much of instruction.
- Constructing and Deconstructing Number.

Mental Math

- Essential skill needed for future grades.
- Can be practiced all year long.

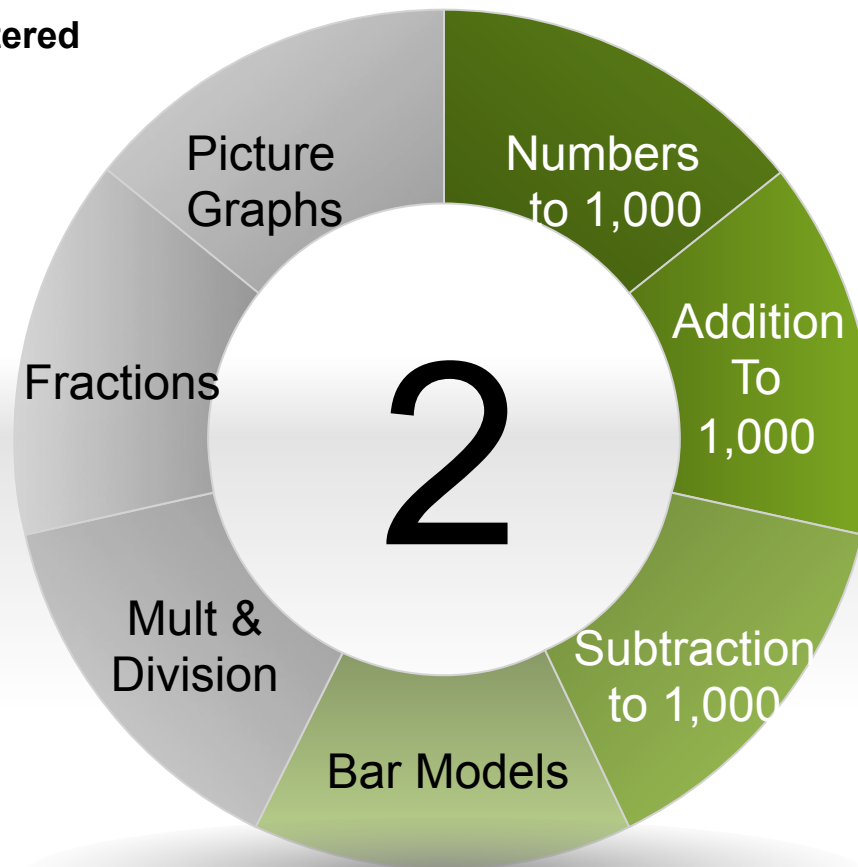
Grade: Second

Grade 1 Material Mastered

- Facts to 10 essential.
- Regrouping concepts essential.

Manipulatives

- Sufficient time needed with concrete materials to understand algorithms.
- Use paper strips and plenty of time when addressing fractions.
- Base Ten blocks



Topics Emphasized

- Chapters on Addition and Subtraction should be given extra focus.
- Problem solving using Bar models should to be taught slowly.

Bar Models

- Chapter 4 :Addition and Subtraction
- Chapter 16: Multiplication & Division

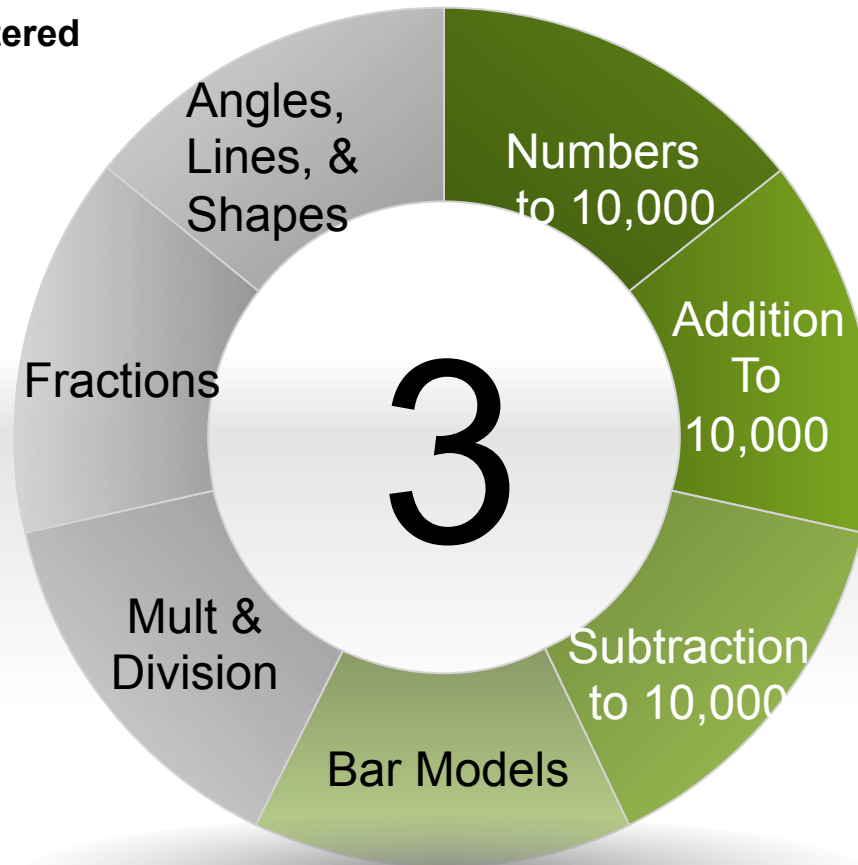
Grade: Third

Grade 2 Material Mastered

- Multiplication facts: 2,3,4,5, and 10 essential.
- This grade addresses: 6,7,8 & 9

Manipulatives

- Sufficient time needed with concrete materials to understand algorithms.
- Use paper strips and plenty of time when addressing fractions.
- Base Ten blocks.



Topics Emphasized

- Mastery of Addition and Subtraction a must.
- Problem solving using Bar models should to be taught slowly.

Bar Models

- First Year: Go back to 2nd grade Chapter 4.
- Chapter 5 :Multi-step and real world problems.
- Chapter 9: Multiplication & Division

Grade: Fourth

Grade 3 Material Mastered

- Multiplication facts.
- Estimation strategies need not be taught towards mastery but practiced year long.

Manipulatives

- Concrete materials and visuals cannot be short-changed.
- Use virtual manipulatives.
- Place Value Disks.



Topics Emphasized

- Number and Operation concepts
- Chapters 1-3 are the most difficult.

Bar Models

- First Year: Go back to 2nd grade Chapter 4 and 3rd grade Chapter 5.
- Bar Modeling technique must be taught.

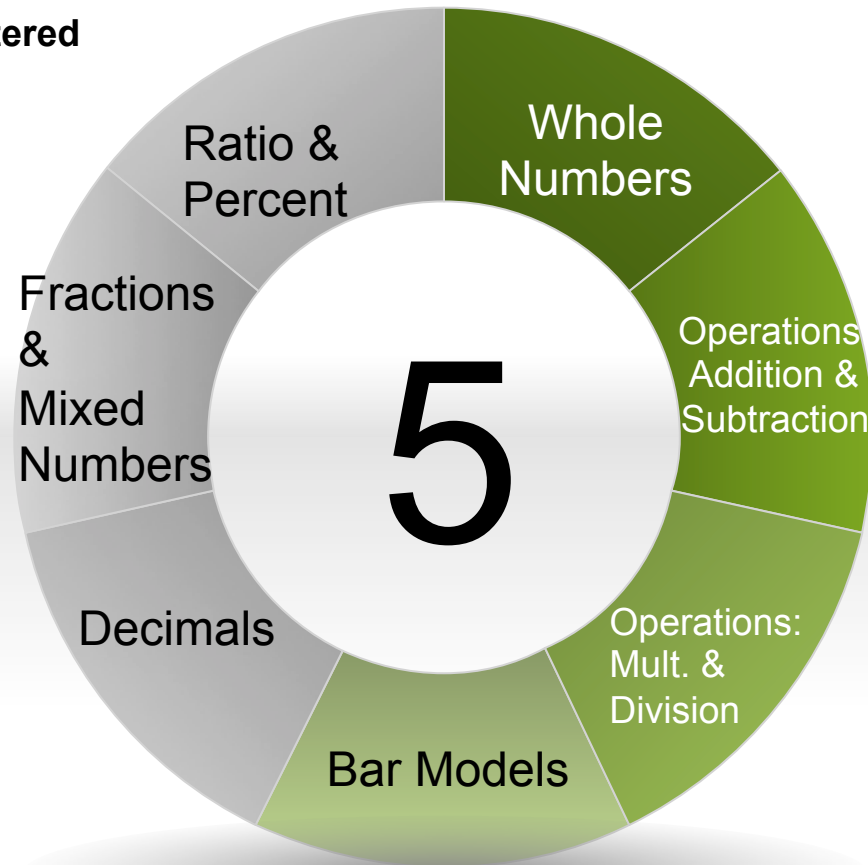
Grade: Fifth

Grade 4 Material Mastered

- Multiplication facts.
- Multiplication & Division
- Decimal & Fraction concepts
- Bar Model technique

Manipulatives

- Concrete materials and visuals cannot be short-changed.
- Use virtual manipulatives.
- Place Value Disks.



Topics Emphasized

- Multiplication & Division of: Whole Numbers, Fractions and Decimals.

Bar Models

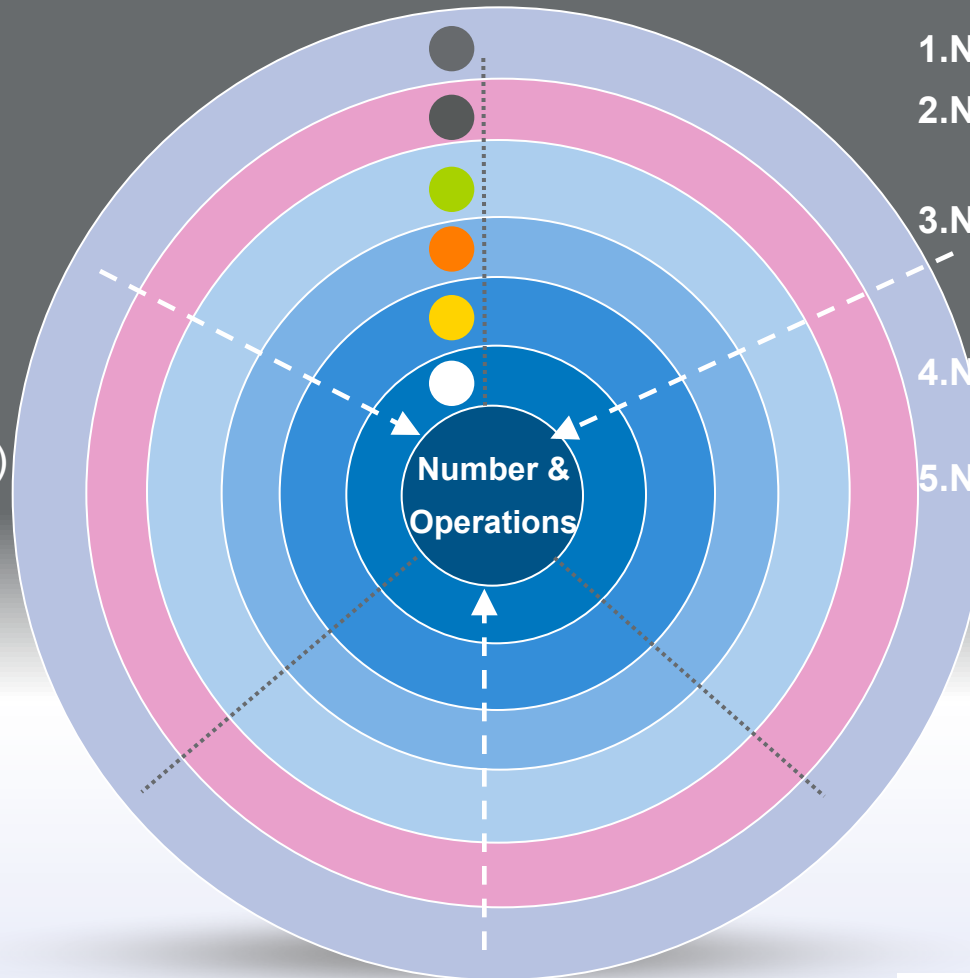
- First Year: Go back 3rd grade Chapter 5 and 4th grade Chapter 3.

Number and Operations

Progressions across grade levels

- K: Chapter 14
- 1st: Chapter 17
- 2nd: Chapters 2 & 3
- 3rd: Chapter 7
- 4th: Chapter 3
- 5th: Chapter 9 (add/sub in 4th grade Chap 8)

- 5th Grade
- 4th Grade
- 3rd Grade
- 2nd Grade
- 1st Grade
- Kindergarten

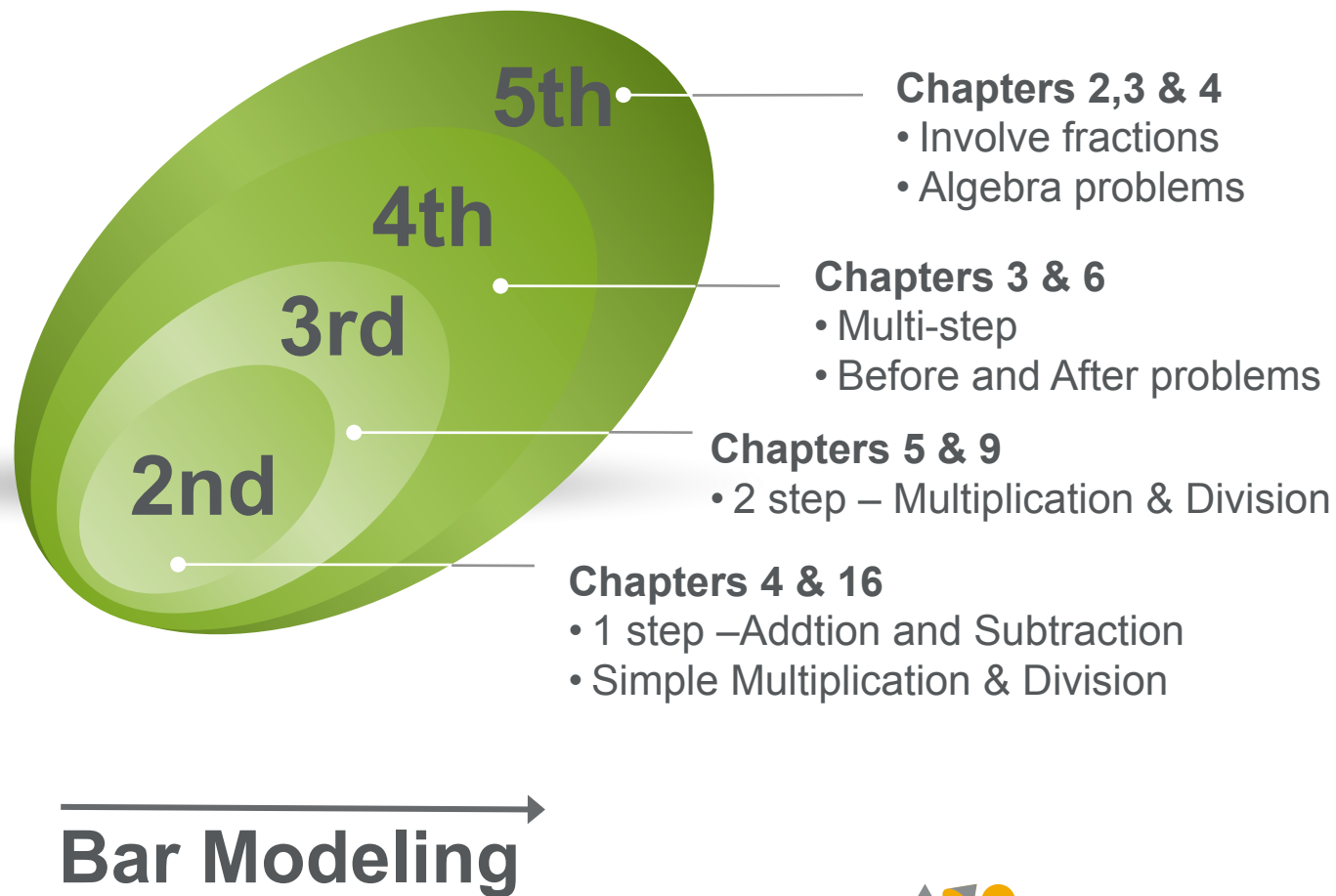


Common Core

- K.NBT.1 Numbers 11-19
- 1.NBT.4 Add/Subtract to 100
- 2.NBT.7 Add/Subtract to 1,000
- 3.NBT.3 Multiply 1-digit by multiples of 10 up to 90.
- 4.NBT.5-6 Multiply & Divide multi-digits.
- 5.NBT.7 Mult/Div/Add/Sub decimals.

Number and Operations

Bar Modeling Across Grade Levels



What to look for in a Math in Focus Classroom

Observation Checklist

What to Look for in a *Math in Focus* Classroom

Teacher _____ Observer _____

Class/Grade _____ Date _____ Time _____

Math Goal(s) addressed in lesson _____

Visible in the classroom...	Observed	Not Observed
Vocabulary support (math "word wall," vocabulary list)	+	+
Summary statements, evidence of conclusions and solutions	+	+
Easy access to student learning tools (manipulatives, rulers, etc.)	+	+
Lesson Structure includes...		
Whole group, direct instruction, and questioning	+	+
Guided groups with differentiation	+	+
Independent practice	+	+
Games, centers, or "Let's Explore" that allow for differentiation	+	+
Helping students make connections to prior knowledge	+	+
Closure/summary of key mathematical ideas	+	+
Teacher is...		
Connecting concrete manipulatives to visual models to abstract notation	+	+
Using pretests and other assessments to provide appropriate instruction	+	+
Helping students use visual models to explain their thinking	+	+
Asking questions that prompt higher-level thinking	+	+
Asking students to justify their answers	+	+
Students are...		
Able to identify what they are learning and how they are doing	+	+
Using manipulatives and other tools appropriately to solve problems	+	+
Interacting on task with others, as well as working independently	+	+
Communicating mathematical ideas to others through examples, models, demonstrations, and logical reasoning	+	+
Working with a partner or with group to justify solutions to problems with each person highly involved	+	+
Sharing strategies including mental math and problem-solving methods	+	+
Comments:		



LOOKFORS



LOOKFORS



Teacher is...

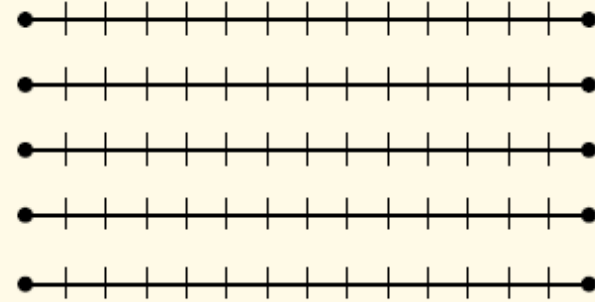
Connecting concrete manipulatives to visual models to abstract notation

Using pretest and other assessments to provide appropriate instruction

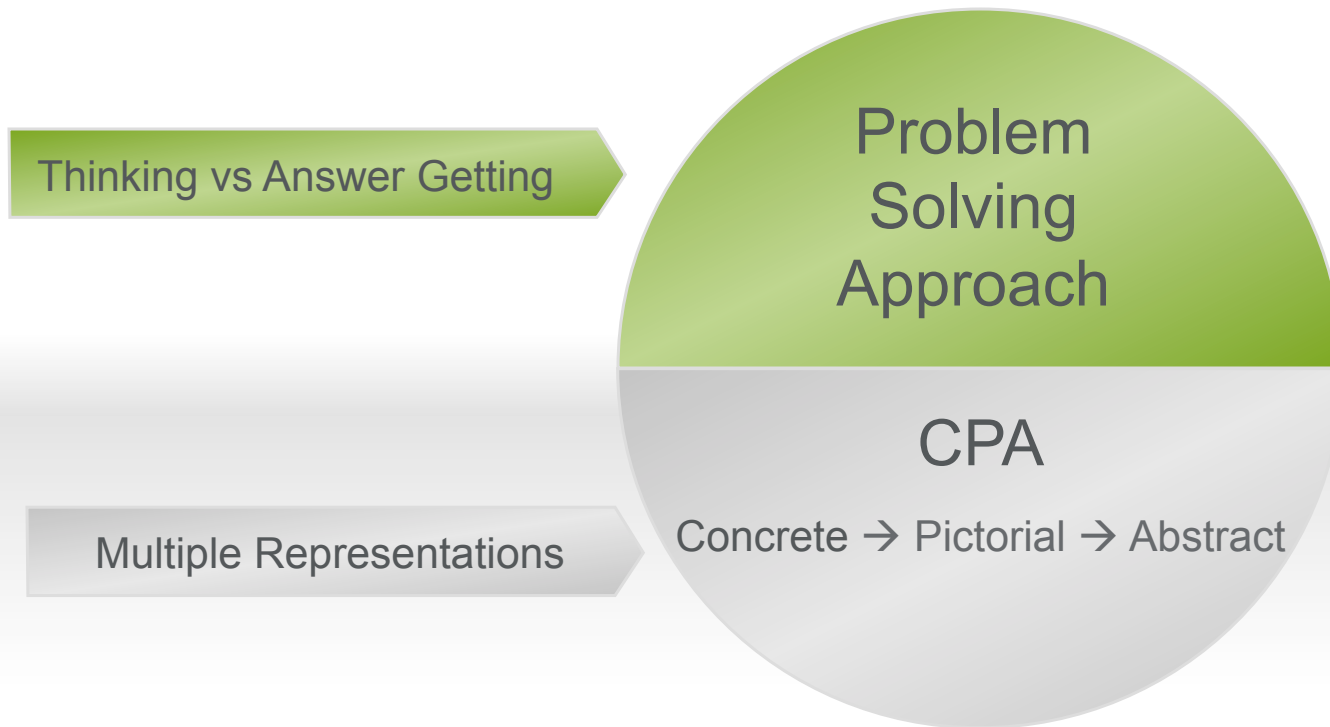
Helping students use visual models to explain their thinking

Asking questions that prompt higher-level thinking

Asking students to justify their answers

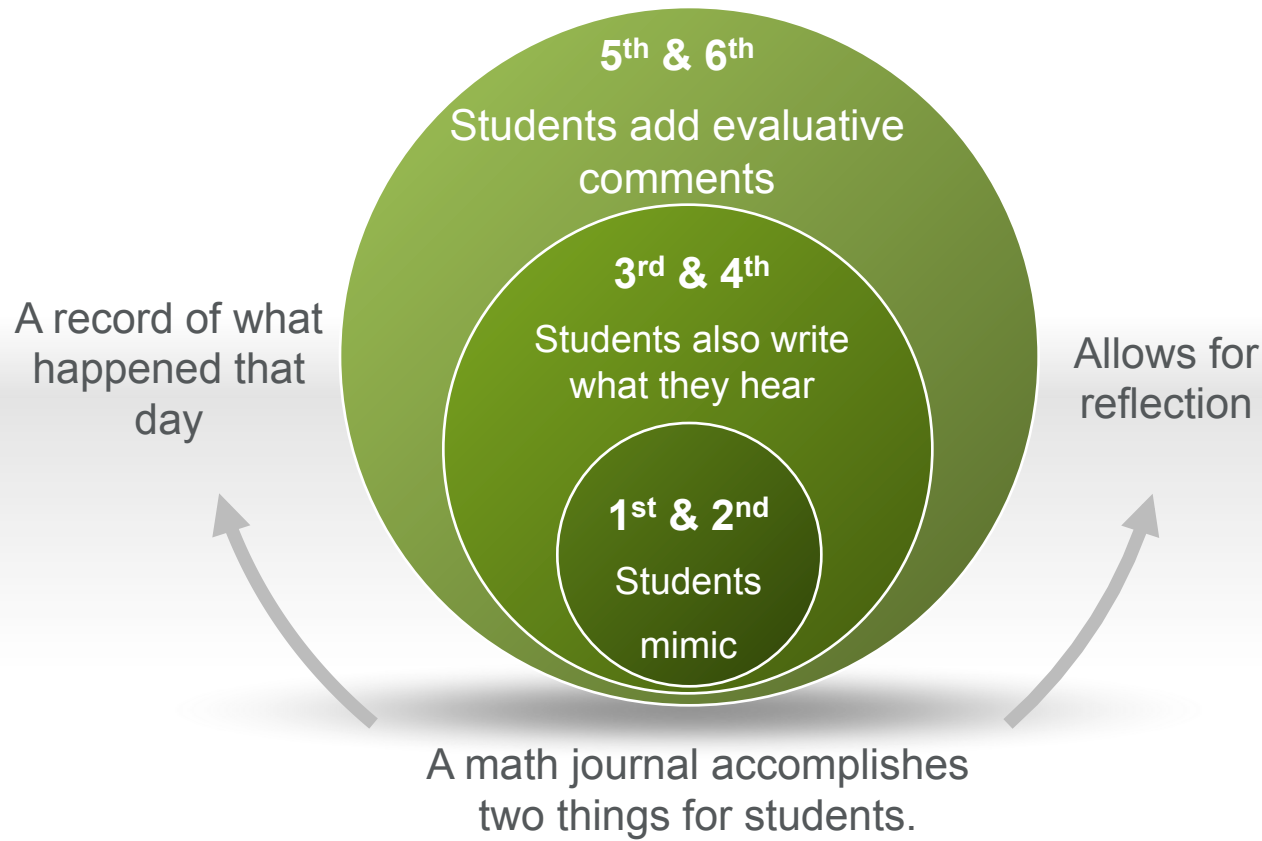


TWO APPROACHES



MATH JOURNALS

Grades 1 to 6 Development





READING AND WRITING MATH
Math Journal

Look around your classroom. Complete the sentences.

- 1 The books on the shelf are near the .
- 2 My backpack is my table.
- 3 sits behind me.
- 4 The is far from me.
- 5 sits to the left of me.

Answers vary.



READING AND WRITING MATH
Math Journal (page 157)

The journal exercises help children to be more aware of their immediate physical environment, and enable them to describe the positions of objects and people around them in the real world using the newly learned vocabulary. Guide individual children to complete the sentences as answers may vary from child to child.



READING AND WRITING MATH
Math Journal

Write real-world multiplication problems using the words and numbers given.
Then solve the problems.

1

5 times

manager

\$860

Mr. Rodriguez

Ms. Jackson

2

12 bags

each

bag

weight

127 pounds

total weight



READING AND WRITING MATH

Math Journal (page 114)

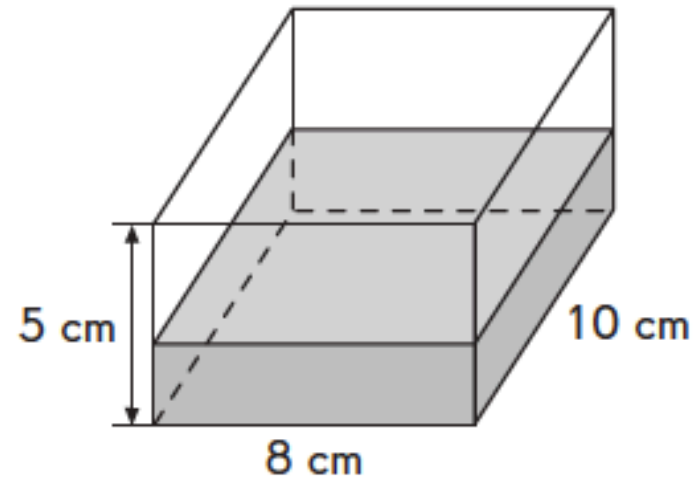
This section allows students to apply their knowledge of multiplication. Students write their own problems using the given words, and then solve their problems. Partners check each other's work. Remind students to use the different operations they have learned when writing their problems. Encourage students to explain the procedure they used when solving the problems to check their understanding.



Math Journal

This rectangular container is $\frac{2}{5}$ -filled with water.
How much more water is needed to increase the height of the water level to 3 centimeters?

Show two methods of solving this problem.
Which method do you prefer? Why?



MATH JOURNALS



Day 1

Day 20

Subtraction

Take Away

Subtract

Minus (-)

Subtraction Sentence

$$10 - 5 = 5$$

Subtraction story

fact form IV

$$8 - 4 = 4$$

$$3 - 0 = 3$$

$$10 - 10 = 0$$



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