



# Primary Math Classroom Practices to Support Coherent Understanding and Application of New Learning



Joan Commons, UCSD San Diego Math Network  
Linda Roach, retired Educator

*Why is precision important in supporting cohesive and coherent learning across the grades?*

With this question in mind, share your responses to these 3 questions with a table or elbow partner:

1. How would guide students in finding a solution to the following subtraction problem:  $200-38$ ?
2. What does “=” represent?
3. If 3 and 5 are shown on a number line, how would you guide students on what to put in the blank?  $3 \quad \_ \quad 5?$

What if it the number line is presented like this:  $3 \quad \_ \quad 5?$

Or like this:  $3 \quad \_ \quad 5?$

*Why is precision important in supporting cohesive and coherent learning across the grades?*

## I. Standards of Mathematical Practice (SMP)

SMP 1: Make sense of problems and persevere in solving them.	SMP 2: Reason abstractly and quantitatively.	SMP 3: Construct viable arguments and critique the reasoning of others.	SMP 4: Model with mathematics (apply the math you know to solve problems).
SMP 5: Use appropriate tools strategically.	SMP 6: Attend to precision.	SMP 7: Look for and make use of structure. (patterns, properties, attributes, overview and shift perspective).	SMP 8: Look for and express regularity in repeated reasoning. (general methods, more efficient, abstract equations, general formulas, maintain oversight of the process while attending to details, evaluate the reasonableness of their intermediate results.

SMP 6



Mathematically proficient students try to communicate precisely to others.

They try to use clear definitions in discussion with others and in their own reasoning.

They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately.

They are careful about specifying units of measure,

and labeling axes to clarify the correspondence with quantities in a problem.

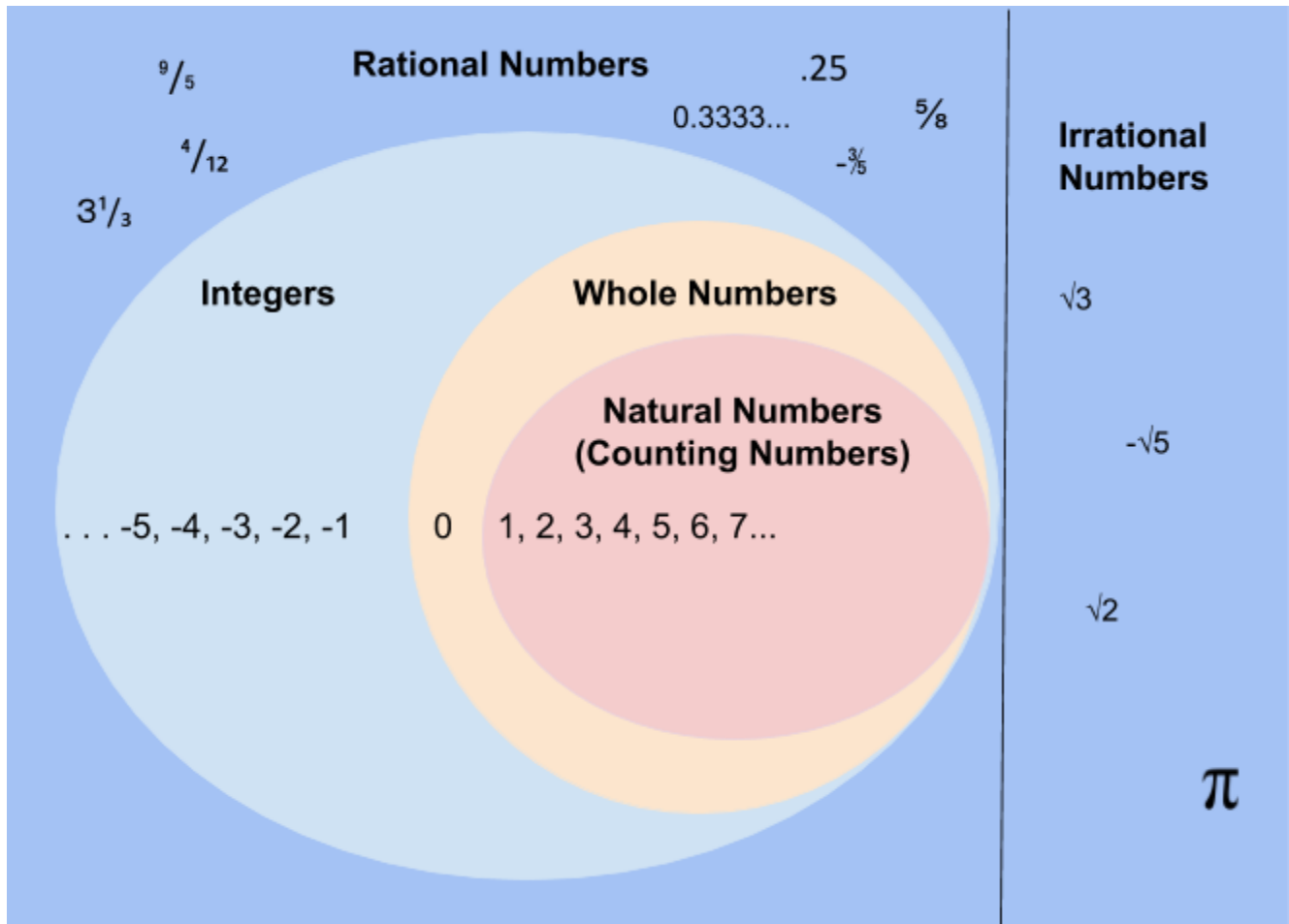
They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context.

In the elementary grades, students give carefully formulated explanations to each other.

By the time they reach high school they have learned to examine claims and make explicit use of definitions.

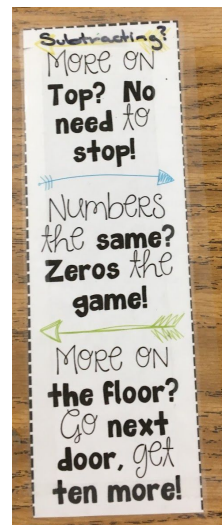
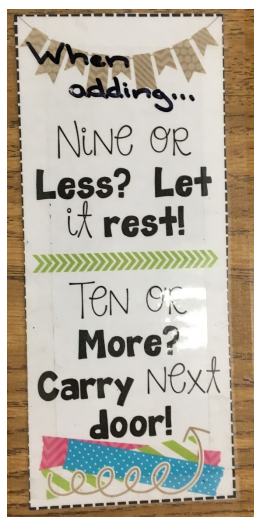
*Why is precision important in supporting cohesive and coherent learning across the grades?*

## II. The Real Number System



What are the implications of this chart in developing number sense?

## III. Building Appropriate and Coherent Understanding of Basic Mathematical Principles: “=”, “-” (subtraction); “+” (addition)



*Why is precision important in supporting cohesive and coherent learning across the grades?*

#### IV. Sense-making in Context: Multiple Meaning Keyword “Clues”

Key Word: **AND**

Example	Context meaning
7=2 <b>and</b> 5	adding together
2½	Two <b>and</b> one-half (whole number and a fractional part)
2.5	Two <b>and</b> 5 tenths (whole number and a decimal fractional part)
\$2.05	Two dollars <b>and</b> 5 cents (two whole dollars and a fraction of another dollar)
Chances of rolling both a 5 <b>and</b> a 3 on dice	Two events that <b>both</b> happen
Sue <b>and</b> Jorge went for a walk	Multiple individuals doing the same activity together
Peanut butter <b>and</b> jelly	One sandwich with two separate ingredients
What is the difference between 6 <b>and</b> 4?	Do we add or subtract to find response?

Key Word: **MORE**

Example	How do we find the solution?
Alice had 5 books. Jill had 9 books. How many <b>more</b> books did Jill have than Alice?	
Alice had 5 books. Jill had 4 <b>more</b> books than Alice. How many books did they have altogether?	
Alice had 5 books. Jill had 4 times as many (or <b>more</b> ) books as Alice. How many books did Jill have?	
Alice had 5 books. She wanted 9 books. How many <b>more</b> books did she need to get?	

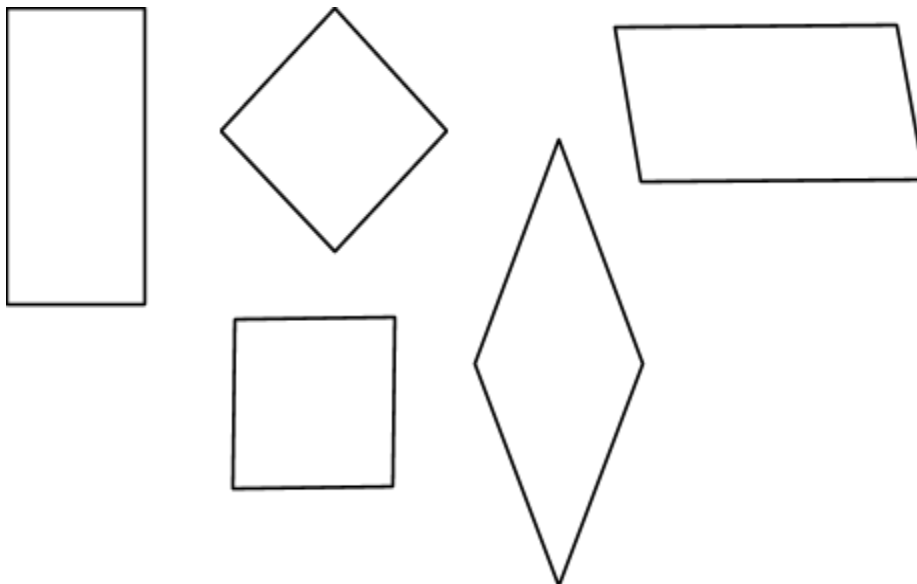
*Why is precision important in supporting cohesive and coherent learning across the grades?*

Key Word: **EVEN** (excerpt from Table UA-1, CA Math Framework, Universal Access Chapter, page 670)

Words with multiple meanings in everyday English	The floor is <u>even</u> . The picture is <u>even</u> with the window. Breathing develops an <u>even</u> rhythm during sleep. The dog has an <u>even</u> temperament. I looked sick and felt <u>even</u> worse. <u>Even</u> a three-year-old child knows the answer.
Words with multiple meanings in academic English	Number: <u>Even</u> numbers (e.g., 2, 4, 6, and so on) Number: <u>Even</u> amounts (e.g., even amounts of sugar and flour) Measurement: An <u>even</u> pound (i.e., an exact amount)

Having seen these examples, what do you think of the the keyword shortcut? What alternative strategy(ies) could be used to support students?

**V. Geometry: Attribute precision**



Is a square a rectangle? Is a rectangle a square? Or are they two entirely different shapes? What is a diamond? How important is shape orientation?

***With all we've discussed, what are at least 2 practices, strategies, actions that you feel you can and will implement next week in your classroom?***

***THANK YOU!***