Principles to Action & Interventions: High Quality Education for ALL Students

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Goals: Leave with ideas to…

- establish clear goals and focus learning,
- nurture reasoning and problem solving,
- facilitate discourse with genuine questions, how, why, when?
- build fluency through a conceptual understanding.

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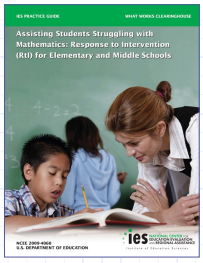
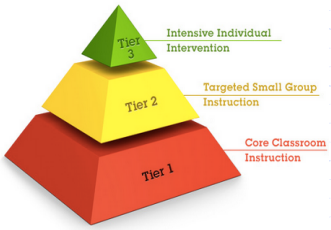




PtA 1: Establish mathematics goals to focus learning

Teachers state the learning goal.

Students discuss what they are learning and why.

Teachers understand the learning progressions and make "in the moment" decisions during their instruction.

Students make connections to previous learning and monitor their progress toward the goals.

Instructional materials should focus on whole numbers K–5

Grade	Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction-counting concepts, skills, place value and problem solving
Grade	**Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding**
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving

Major Clusters – areas of intense focus, where students need fluent understanding and application of the core concepts (approximately 70%)

PtA 2: Implement tasks that promote reasoning & problem solving

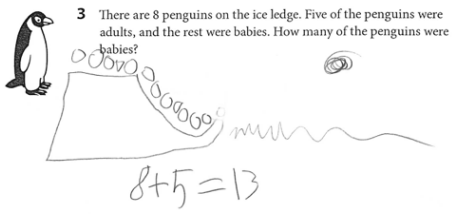
Teachers select tasks with multiple entry points.

Students persevere in exploring and reasoning, using tools and representations to support their thinking.

Teachers pose tasks at a high cognitive demand and support students without taking over their thinking.

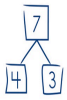
Students use a variety of approaches and justify their strategies to one another.

What's wrong with this picture?



Include instruction on solving word problems based on common underlying structures.

4 + 3 = 7



Matching Pairs with kinders

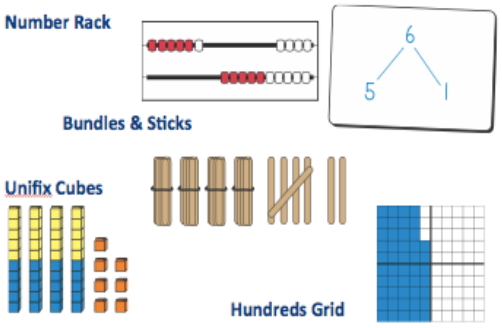
PtA 3: Use & connect mathematical representations

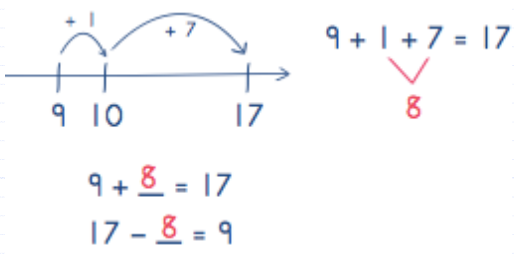
Teachers provide time for students to use, discuss, and make connections among representations.

Students describe and justify their understanding with drawings, diagrams, and other representations.

Teachers introduce forms of representations that can be useful to students.

Students contextualize mathematical ideas by connecting them to real-world situations.





Free digital apps from MLC

Number Frames

Number Frames help students structure numbers to 5, 10, 20, and 100. Students use the frames to count, represent, compare, and compute with numbers in a particular range.

Open Web App
Apple App Store
Windows Store
Chrome Store

Number Line

Number Line helps students visualize number sequences and illustrate strategies for counting, comparing, adding, subtracting, multiplying, and dividing. Choose number lines labeled with whole numbers, fractions, decimals, or negative numbers.

Open Web App
Apple App Store
Windows Store
Chrome Store

Number Pieces

Number Pieces helps students develop a deeper understanding of place value while building their computation skills with multi-digit numbers. Students use the pieces to represent multi-digit numbers, regroup, add, subtract, multiply, and divide.

Open Web App
Apple App Store
Windows Store
Chrome Store

Number Pieces Basic

Number Pieces Basic is a simplified version of Number Pieces. It has fewer features, putting greater focus on place value, counting, addition, and subtraction with multi-digit numbers.

Open Web App
Apple App Store

Show how would you solve…

- 17 + 9
- 26 + 52
- 29 + 37
- 103 + 78

PtA 4: Facilitate meaningful discourse

Teachers select and sequence student work.

Students listen to the peers, seeking to understand each other.

Students compare and contrast approaches to solving a task.

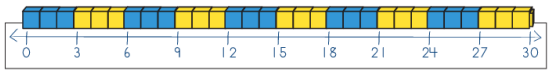
PtA 5: Posing purposeful questions

PtA 6: Build procedural fluency from conceptual understanding.

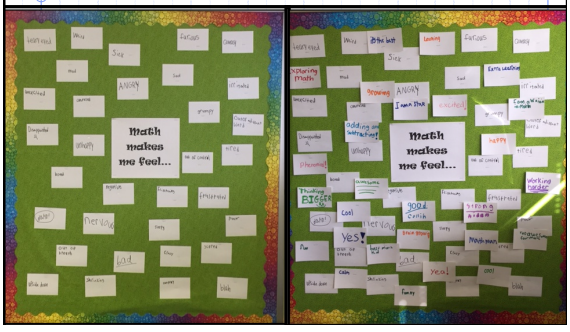
Teachers give students access to materials and the gift of time to construct meaning and methods of their own.

Students use flexible, accurate, efficient and appropriate strategies.

Have the students identify the multiples of 3 again and take turns labeling each of the points.



PtA 7: Support productive struggle in learning mathematics



Productive struggle…

PtA 8: Elicit and use evidence of student thinking

Teachers elicit and gather evidence of student understanding, progress monitoring through interview and paper-pencil tasks.

Students reveal their reasoning in written work and discussions.

Show $\frac{2}{6}$ of this rectangle.

What do you wonder about?

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