



Math

PersonalizedPD's continuous learning process has teachers surface challenges in their classroom and try proven teaching strategies to find what works to accelerate student learning. Our 5,000+ proven strategies (pulled from the lessons of our highly-effective Master Teachers) are organized in a strategy browser by Student Growth Areas and corresponding Teaching Challenges. Our **Math Teaching Challenges are aligned to the Math CCSS** and organized within the SGAs to build in complexity from entry to mastery.

Student Growth Areas & Teaching Challenges



Working Through a Complex Task

Make Meaning of Problems

- Meaningful Initial Approach
- Take Risks and Try Strategies
- Self-Monitor Progress
- Select Appropriate Strategies
- See Relationships between Various Representations
- Explain Problem Solving Strategies
- Independently Solve Complex Math Tasks



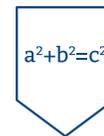
Building Conceptual Understanding

- Activate Prior Knowledge
- Employ Existing Strategies
- Self-Monitor
- Apply Existing Strategies to Solve Novel Problems
- Use Visual Models and Manipulatives
- Explain Thinking
- Recognize Patterns and Generate Rules
- Apply Conceptual Knowledge to Non-Routine
- Use Visual Models, Patterns, Rules, and Properties



Using Precise Mathematical Language

- Identify Previously Mastered Language
- Access Tools to Support Precise Math Language Usage
- Revise Math Language
- Speak with and Listen for Math Language
- Employ Math Language to Explain Math Thinking



Viable Arguments

- Explain Thinking
- Revise Thinking Based on Feedback
- Provide Feedback
- Justify Thinking with Evidence
- Evaluate Peer Arguments
- Construct Viable Arguments

How can I help students make meaning of a math problem?

INDICATORS OF SUCCESS

- » Students are able to access or use resources in order to support their problem solving process without teacher prompting
- » Students are able to identify the unknown quantity they need to solve for
- » Students are able to select the appropriate operation or algorithm for solving the problem
- » Students are able to verbalize what the problem is asking

Sample Strategies

Break Apart Method



Sarah introduces students to the break apart method as a means of chunking to making meaning of multi-step problems. Sarah's students underline each step of the problem to break the problem into more manageable chunks.

SOURCE: BetterLesson

GRADES: Upper Elementary

QUESTIONS TO CONSIDER

How could breaking apart multi-step problems help students making meaning of the problem?

How could you support students in breaking apart problems in the correct place?

What could be challenging about this strategy for your students?

How could you modify this strategy further to meet the needs of your students?

Act It Out To Make Meaning



Joyce reads a subtraction word problem to the class and her students (disguised with animal masks) act out the problem. The class then discusses the problem, its meaning, and how to solve it. Joyce continues this routine until all students have had a chance to act out a problem.

SOURCE: Teaching Channel

GRADES: Lower Elementary

QUESTIONS TO CONSIDER

How would you modify this strategy for the students in your classroom?

What might be challenging for students about this strategy?

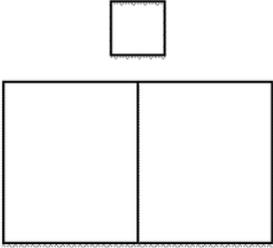
What routines could you implement to make this strategy a success?

How could acting out problems support students to make meaning of the problem?

Part-Part-Whole Model

Choose a domino from your group. Create a part/part/whole model for that domino. Write the addition sentences for that model.

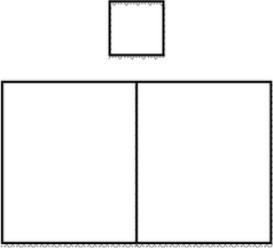
1.



_____ + _____ = _____

_____ + _____ = _____

2.



_____ + _____ = _____

_____ + _____ = _____

Kristen employs the use of the part/part/whole model, which is foundational to composing and decomposing problems. Using this model supports Kristen's students to understand the relationships of numbers in word problems and helps them to make meaning of the problem.

SOURCE: BetterLesson

GRADES: Lower Elementary

QUESTIONS TO CONSIDER

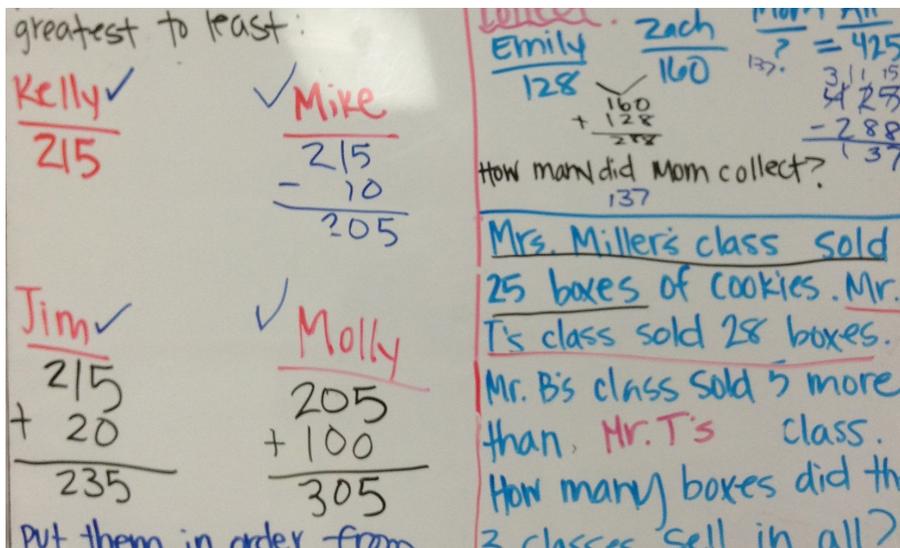
How could you introduce this strategy to your students?

How could you use models, such as part-part-whole, to help students make meaning of complex tasks?

How could these models support students to conceptually grow in their mathematical understanding?

How could you modify this strategy for your students?

Pull Out Information From Problems



Sarah begins the lesson with guided practice of pulling out important information from problems. After the guided practice, Sarah's students work in groups to complete problems and are encouraged to use this strategy. Sarah reflects on the student's work after this practice.

SOURCE: BetterLesson

GRADES: Upper Elementary

QUESTIONS TO CONSIDER

How could you introduce this strategy to your students?

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How could you modify this strategy for your students?