Math

Personalized PD’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

![Diagram of Student Growth Areas and Teaching Challenges]

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**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.

**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.

**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?

**SOURCE:** BetterLesson  
**GRADES:** Upper Elementary

**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.

**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.