

Model Drawing for Higher-Level Word Problems



 **Math With Meaning**
Success the Singapore Way

On-Site Training for 6-9 Educators

Mathematical achievement requires basic number sense and an ability to solve problems. All too often, children in the U.S. are lacking in both areas, as international testing in recent years has shown. For our students to master these essential building blocks of algebraic thinking, educators need to learn new strategies for teaching them. That's where the power of Math With Meaning comes in, providing your staff with targeted but flexible tools that will help every student truly understand and succeed in mathematics.

Who Should Attend

- 6-9 Classroom Teachers
- Math Coaches/Mentors
- Principals
- Lead Teachers
- Math Curriculum Specialists & Directors
- Special Education Teachers
- Gifted & Talented Teachers

Participants Will:

- Learn valuable strategies that can be applied to word problems appropriate for students in upper primary through algebra 1.
- Translate multi-step word problems into visual models, providing graphic representations of the information in the problems. This model “talks to the students,” helping them to visually identify the question they are trying to answer and to figure out adjustments that need to be made to the model to get to that answer.
- Gain knowledge of how to use a problem both as a jumping-off point for higher-level mathematical thinking and as a vehicle for practicing other mathematical skills.
- See how this approach to problem solving will build the confidence students need to persevere and find solutions to more complicated word problems.
- Discover how to build conceptual understanding by posing questions to students that require them to think, rather than just asking them for the answer.
- Learn to encourage students to justify their answers and to celebrate alternative approaches to solving problems. Questions like “Why?” “Can you explain that?” and “How do you know that?” become part of all instruction.

Why Singapore Math?

- In international testing known as TIMSS (Trends in International Mathematics and Science Study), Singapore students in grades 4 and 8 have scored at or very near the top—well ahead of the U.S.—since 1995.
- A 2007 report from the National Mathematics Advisory Panel noted how critical it is for students to develop computational proficiency with whole numbers. This includes automatic recall of number facts and fluency with the standard algorithms of the 4 mathematical operations. Singapore Math and Model Drawing in particular, offer a powerful way to build this proficiency.



Model Drawing for Higher-Level Word Problems

NCTM has defined problem solving as “engaging in a task for which the solution method is not known in advance.” Too often, when students are faced with problems that are wordy or complicated, they get frustrated and just throw out some random answer or make no attempt at all at the problem. They don’t feel confident enough even to start considering the “solution method” because the methods they’ve been taught are not visual, and definitely haven’t built understanding.

Model Drawing for Higher-Level Word Problems will provide you with techniques for working through problems that require multi-step solutions. When you share these strategies with your students, they will become more confident and competent problem solvers.

Program Outline

Participants will learn how to use Model Drawing with math content from upper primary grades through algebra 1 and will be introduced to various techniques that help make these more challenging problems easier to comprehend.

Much of the training will focus on problems that are based on whole numbers, fractions, ratios, decimals, and percents, and that involve multiple step solutions. In addition it will tackle rate/distance, consecutive-number, and age problems as well as word problems normally solved by using a system of linear equations in which the unknowns are described by expressions containing variables.

Also using the “Working Backwards” approach, participants will learn how to develop word problems based on a given bar model or algebraic equation. The ability to translate from one form of a word problem to another form reinforces true comprehension.

Attendees will have many occasions to try out their new skills with the practice problems provided throughout the day. They’ll have the opportunity to ask questions and to share ideas with colleagues. And, they’ll come away with a new understanding of an incredibly powerful strategy for building their students’ problem-solving skills.

Program Materials

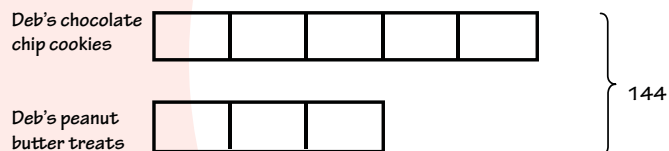
Comprehensive Resource Book

As part of the training, every participant will receive a Resource Book containing all problems in all topic areas covered during the training. This resource will become invaluable to you when you are looking for good (and challenging) word problems to practice with your students. Complete solutions are provided for all problems.

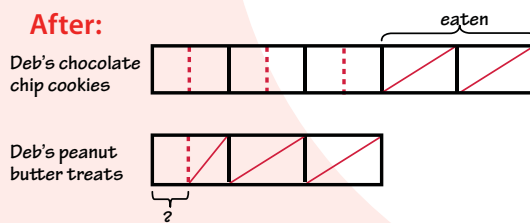
What Does Model Drawing Look Like?

Deb baked a total of 144 chocolate chip cookies and peanut butter treats. Initially the ratio of chocolate chip cookies to peanut butter treats was 5:3. After Deb’s friends ate $\frac{2}{5}$ of her chocolate chip cookies and some of her peanut butter treats, the cookies outnumbered the treats 6 to 1. How many peanut butter treats did she have left?

Before:



After:



$$8u = 144$$

$$1u = 18$$

$$\frac{1}{2}u = 9$$

Deb had 9 peanut butter treats left.



About the Program Developer

ANNI STIPEK

Anni writes and presents from more than twenty years of classroom teaching experience. In addition to creating on-line Singapore Math courses, she has taught in classrooms from kindergarten through eighth grade, and she is eager to share with other educators the Singapore strategies that have made such a difference for her own students.



What Teachers Say

“This needs to be an element in all of our math instruction!”

– Lucy Stratton, 6th Grade Teacher, Murfreesboro, TN

“WOW! You have changed how I will teach math.”

– Rachel Throneberry, 9th Grade Teacher, Smyrna, TN



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