



## Singapore Math with Dawn Swartz

### Lesson 7: The Model Drawing Method: Addition and Subtraction

#### Outline:

What is model drawing? How will model drawing help your students?

- The purpose of model drawing is that it provides a strategy for students for solving word problems.
- This is a visual strategy that the student can use to relate the information that is known to an unknown quantity.
- The model drawing helps students to know how to get started in a problem.
- When you see the visual of the bar model it helps the students to know what mathematical operation use.
- The equal units method is a connection that bridges the chasm to pre-algebra and algebra.
- Singapore Math is very language based. This helps students develop reflective reading skills.

#### Two Types of Bar Models

- Part-Whole Bar Models
  - Kindergarten: Talked about it
  - First Grade: Part-whole represented in the number bond
  - Second Grade: Students use concrete/discrete models, students see individual unit and picture in the drawn bar model
  - Third Grade: Draw part-whole Bar Models
- Comparison Bar Models

#### Proportional Bar Modelling for Addition and Subtraction (Third Grade)

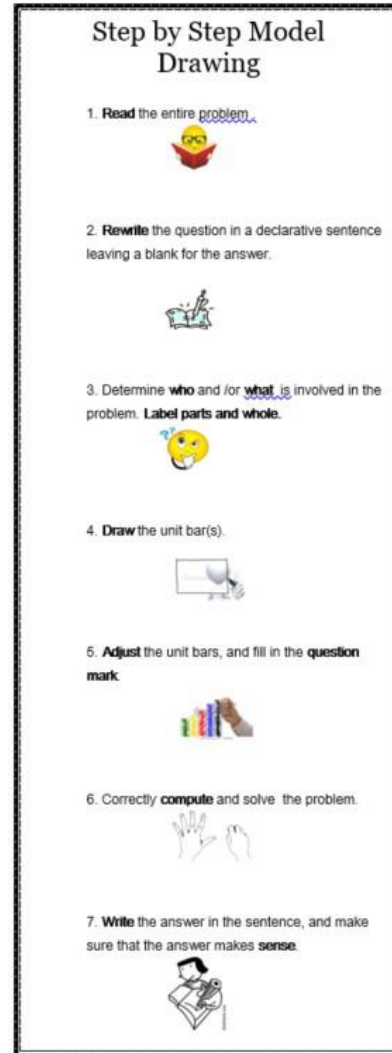
- Work together as a grammar school team to decide what you want bar modelling to look like. What kinds of things will we expect? What kinds of things will we assess?
- At the start of a new year, train the students about your expectations for working with a bar model.
- The part-whole model is another way to draw a number bond. Both of these help to see what computation is needed for the problem.
- **Drawing proportionally:** In a number bond, the pieces are the same size. In bar modelling, if one part is larger and one part is smaller, represent these values in the drawing. Train the students to draw the pieces of the bar proportionally.



- **Brackets:** Teach the students to draw brackets by drawing a carrot with two upside down smiles, or a “v” with two smiles. Students could also be taught to draw wide “V” shapes if they struggle with the other brackets.
- **Model drawing is process not a procedure.** You are developing a strategy for problem solving. You are not teaching computation, which already came in another part of the unit.
- **For the assessment of bar models and word problems, you need to assess the problem solving strategy and not just the answer.**

### Follow along with Dawn on your word problem print outs (24:00).

- Ask reflective questions about the problem to pull the pieces apart.
- Example question: What tense should we use to rewrite our sentence?
- Students could label the parts and/or whole in the word problem.
- **Teach the students to draw the bar model (36:30).**
  - Use comparison language that has already been developed.
  - Help students to learn to write problems from top to bottom and left to right. The teacher shouldn't need a map to find the pieces of the problem.
  - Math is orderly, teach the students to work in an orderly way.
  - The question mark on the bar model should match the blank in the rewritten sentence.
- **Question 2 (45:30)**
  - Example question: Ask students to read a statement that has a prepositional phrase or an adjective in it (in the rewritten sentence).
  - Example question: What is Olivia doing in this problem? What is she doing with the cookies? Do we know how many cookies Olivia made all together?
  - Integrate grammar about how use numbers as words or numbers as digits in a sentence.
- **Question 3 (55:20)**
  - Repeat the steps on the bookmark for your students over and over again.





- When sentences start with a subject, the rewritten sentences uses a subject noun rather than a pronoun. Ensure that the verb tense is the same.
- Example questions: What has just happened to Joseph? What did Joseph get for his birthday? What did he do with that money? Did he spend all of his money?
- Number bonds can be drawn with more than two parts.
- Numbers can be written with brackets or inside the bars in the bar model.
- Depending on the grade, a student would do this problem in two steps or written as one long equation.
- Help students learn to divide their workspace to keep part one separate from part two.

**Part-Whole Addition and Subtraction**

3. Joseph received \$75 for his birthday. He bought a new scooter for \$26 and a helmet for \$15. How much money did he have left to save?

$26 + 15 = ?$   
 $75 - 41 = ?$   
34  
Joseph saved \$34 from his birthday money.

• **Question 4 (1:11:00)**

- Sometimes you can check off a sentence to show that you have taken care of that sentence. As problems get complicated, if you cross them out then you know you have taken care of it. You can reread other parts of the question that aren't crossed off.
- The students would have strategies for computation. If all of the places need to be renamed, that is a good time use the algorithm.
- Ask students to tell about different ways to combine the numbers at the computation step in the problem.

**Part-Whole Addition and Subtraction**

4. During the month of July, 1255 adults and 3619 children visited the theme park. What was the total number of people who visited the park that month?

$1255 + 3619 = ?$   
 $1254 + 3620 = ?$   
4874  
4874  
In the month of July, 4874 people visited the park.

• **Question 5 (1:25:08)**

- Train the students to look at the numbers to determine how to compute the problem.