

# Singapore Math

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Parent workshop: January 12, 2015



# Overview of Today's Workshop

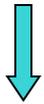
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- Importance of math facts fluency
- Bar modeling
- Questions

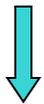
# Importance of Math Facts Fluency

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$$\frac{3}{8} + \frac{5}{6}$$



$$\frac{9}{24} + \frac{20}{24}$$



$$\frac{29}{24} \rightarrow 1 \frac{5}{24}$$

## Procedure

1. Find the LCD
2. Rewrite the fractions
3. Add fractions
4. Rewrite as mixed number
5. Check for reasonableness

# Importance of Math Facts Fluency

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## Number of math facts needed

- Finding the LCD
    - 3 to get to  $8 \times 3$
    - 4 to get to  $6 \times 4$
  - Convert the fractions
    - $24 \div 8 = 3$
    - $3 \times 3 = 9$
    - $24 \div 6 = 4$
    - $5 \times 4 = 20$
  - Add the fractions
    - $9 + 20 = 29$
  - Convert to a mixed number
- 14 or more math facts!
  - Put yourself in the shoes of a child with out automaticity (lost at multiples of 8)



# Importance of Math Facts Fluency

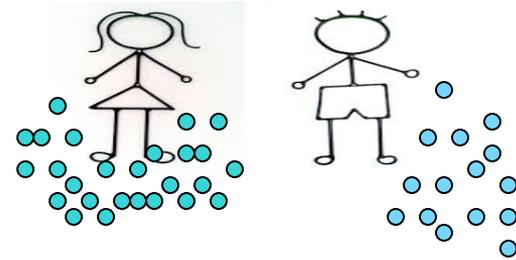
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## ○ Automaticity and the Brain

- Addition and subtraction fact retrieval speed predicted performance on word problems (Kail & Hall, 1999)
- Fact retrieval speed predicted performance on a broad range of math items on standardized tests, including items focused on conceptual understanding, data interpretation and reasoning (Royer et al, 1999)
- Longitudinal study of 300+ students from K to G3 showed that fact retrieval from long-term memory in early grades predicted eventual membership in High or Low Achieving groups (Geary et al, 2009)

# Bar Modeling

- Students in the U.S. are taught many strategies when trying to tackle word problems. One strategy includes “draw a picture”.
- Difference between traditional “draw a picture” and Singapore Math model.
  - Jill has 26 cookies and Jack has 15 cookies. How many cookies do they have in all?



$$26 + 15 = 41$$



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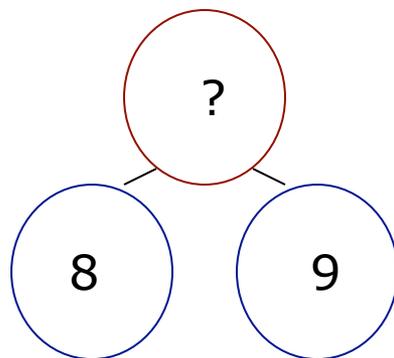
$$26 + 15 = 41$$

# Bar Modeling: Traveling through the years

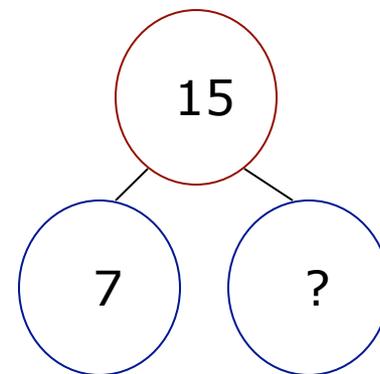
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## 1<sup>st</sup> and 2<sup>nd</sup> grade

- Bar modeling is not formally introduced until the 3<sup>rd</sup> grade.
- Number bonds are used to encourage the part-part-whole concept.



Two parts = add  
 $8+9=17$



1 part & 1 whole = subtract  
 $15-7=8$

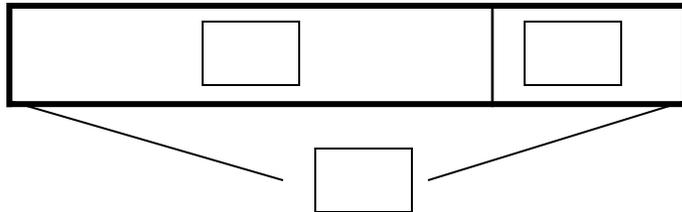
# Bar Modeling: Traveling through the years

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## 3<sup>rd</sup> grade

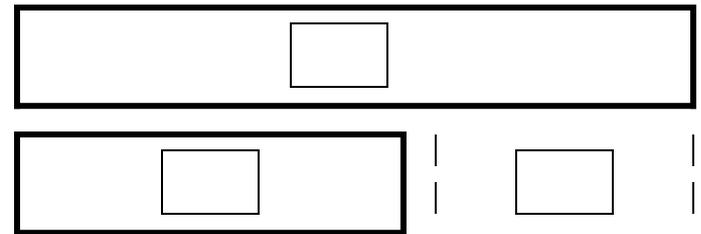
### Part/Whole Model

Sean had 379 stamps. His friend gave him 45 stamps. How many stamps did Sean have altogether?



### Comparison Model

Marco has \$162. Zoe has \$45. How much more money does Marco have than Zoe?



# Bar Modeling: Traveling through the years

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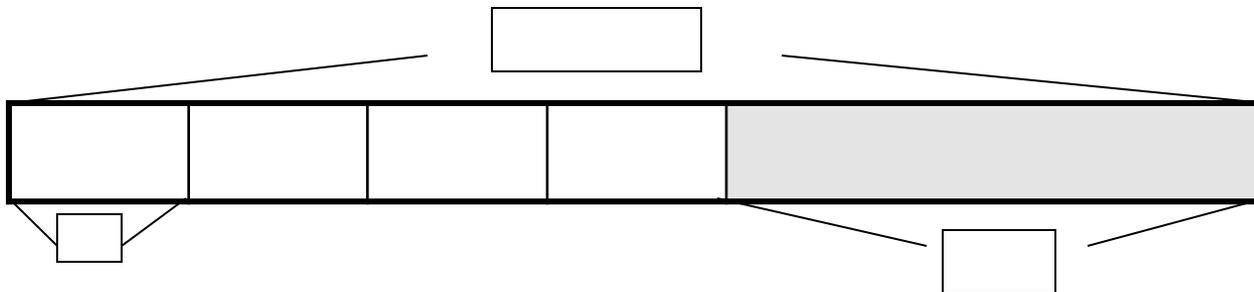
## 3<sup>rd</sup> grade

### Multi-stepped word problem example:

Sam spent \$32 on 4 toy cars and a toy airplane.

The airplane cost \$12.

How much more did the airplane cost than 1 toy car?

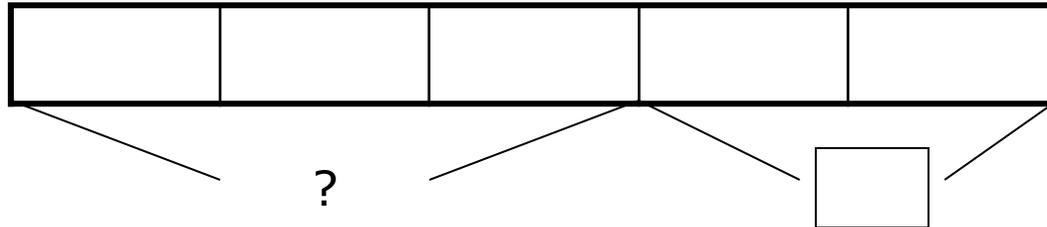


# Bar Modeling: Traveling through the years

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## 4<sup>th</sup> grade

John bought some stamps. He used  $\frac{3}{5}$  of them to mail letters. He had 12 stamps left. How many stamps did he use?

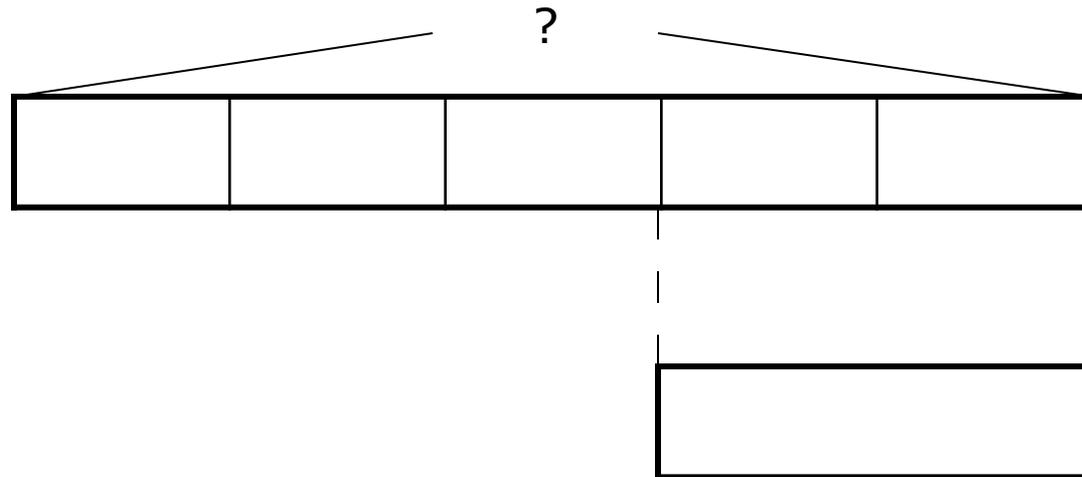


# Bar Modeling: Traveling through the years

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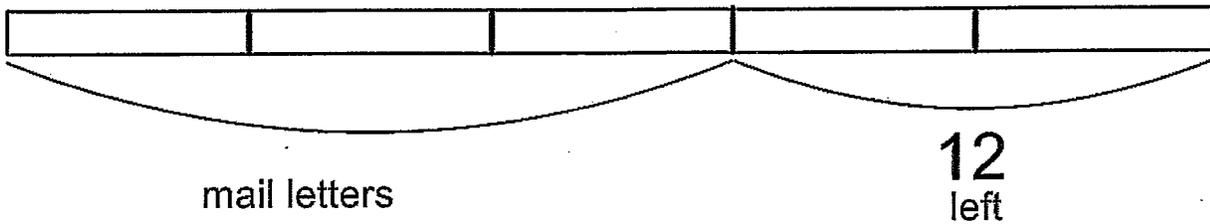
## 5<sup>th</sup> grade

Christina made some pancakes. She sold  $\frac{3}{5}$  of them in the morning and  $\frac{1}{4}$  of the remainder in the afternoon. If she had 300 pancakes left, how many pancakes did she make?



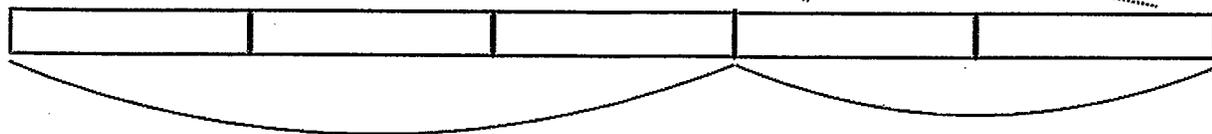
John bought some stamps. He used  $\frac{3}{5}$  of them to mail letters. He had 12 stamps left. How many stamps did he use?

The first thing to do is draw a bar and label it. Divide the bar into fifths.



John bought some stamps. He used  $\frac{3}{5}$  of them to mail letters. He had 12 stamps left. How many stamps did he use?

A mini-total of 12 has been divided into two units. Now you can find the value of the basic-unit that makes up the total bar.



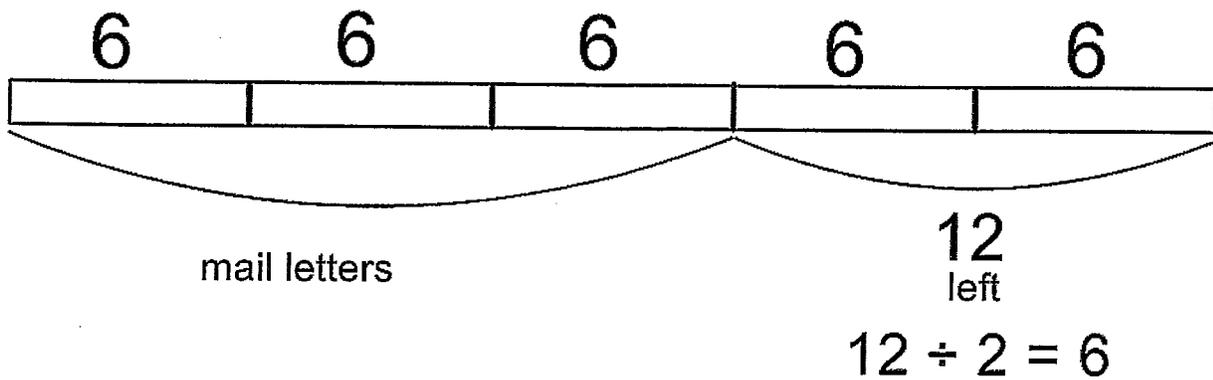
mail letters

12  
left

$$12 \div 2 = 6$$

John bought some stamps. He used  $\frac{3}{5}$  of them to mail letters. He had 12 stamps left. How many stamps did he use?

Now we know the value of the basic unit. It is 6.

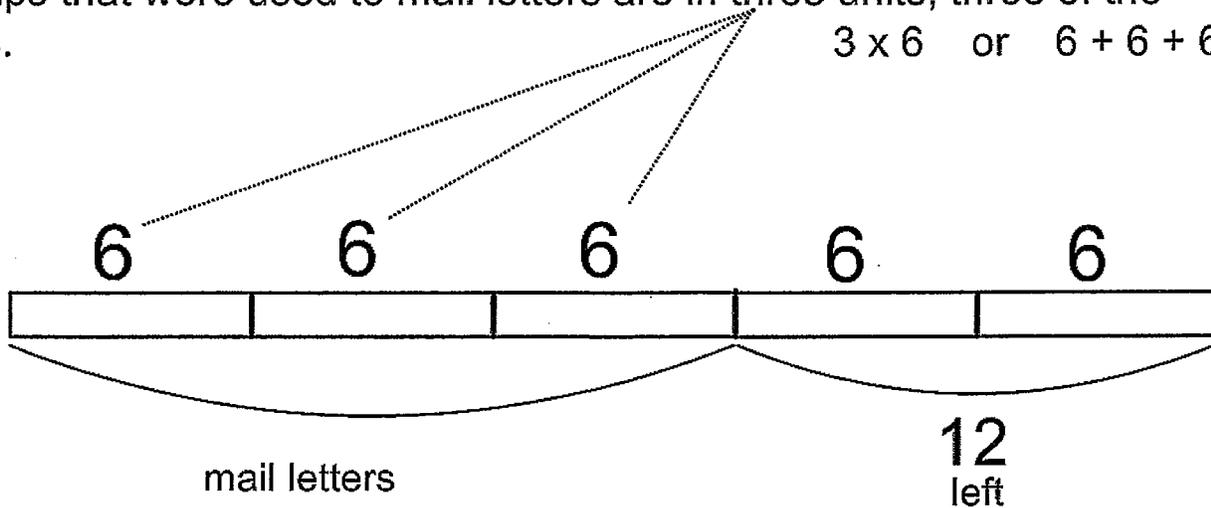


6

John bought some stamps. He used  $\frac{3}{5}$  of them to mail letters. He had 12 stamps left. How many stamps did he use?

Now we have enough information to answer the problem. The stamps that were used to mail letters are in three units, three of the fifths.

$$3 \times 6 \text{ or } 6 + 6 + 6 = 18$$

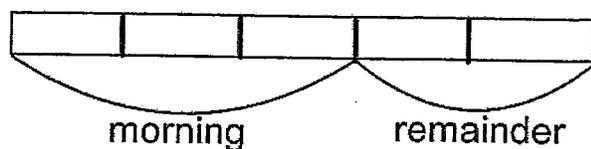


$$12 \div 2 = 6$$



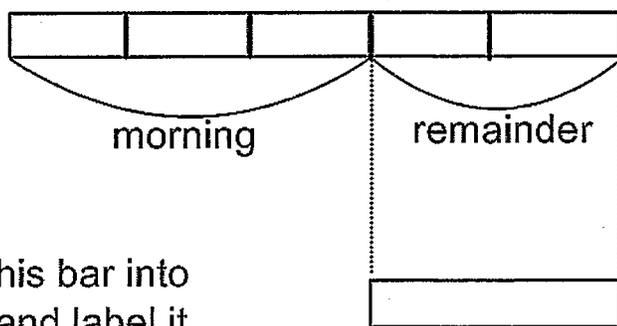
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The first thing to do is to make a bar that is divided into fifths. Label the bar with words.



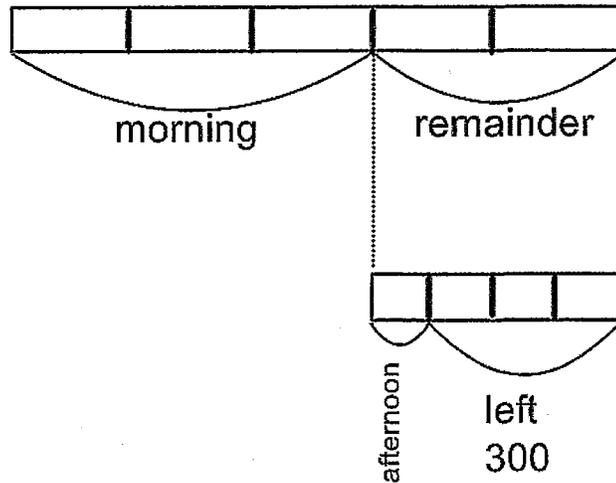
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Next, take the part that is the "remainder" and make that a new bar!

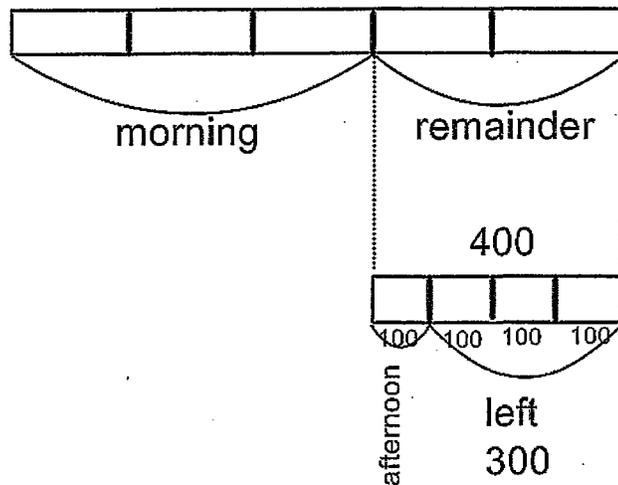


Divide this bar into fourths and label it.

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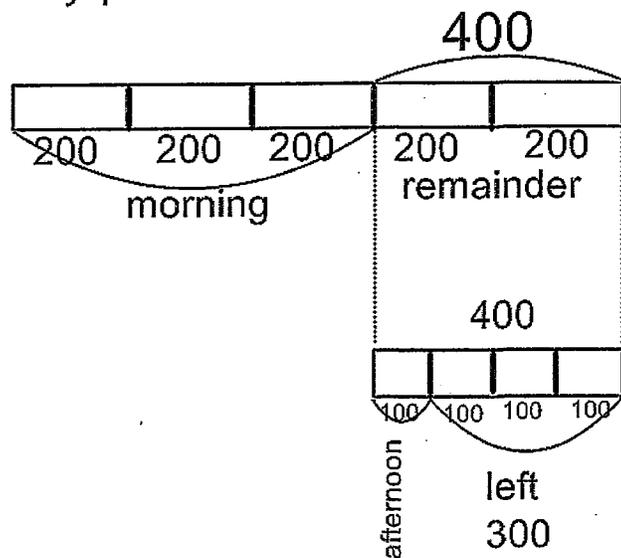


You have 300 divided by 3 units.

$$300 \div 3 = 100$$

That means each small unit is 100 and the entire remainder's value is 400.

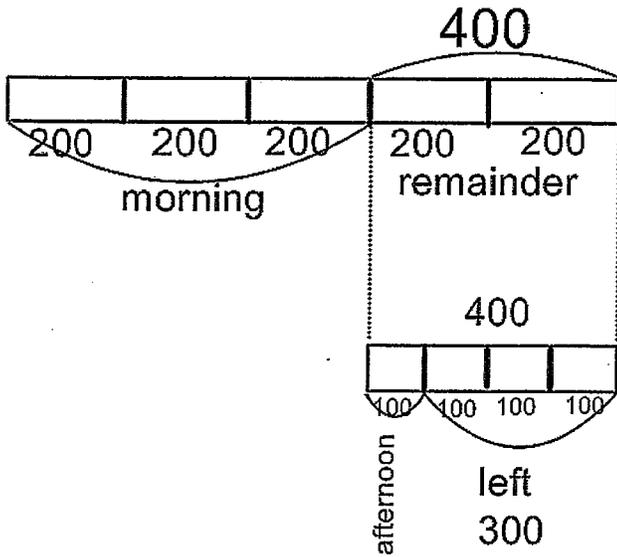
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This means that, in the original bar, 2 of the fifths together are 400.

Each of the fifths is therefore 200.

Christina made some pancakes. She sold  $\frac{3}{5}$  of them in the morning and  $\frac{1}{4}$  of the remainder in the afternoon. If she had 300 pancakes left, how many pancakes did she make?



Multiply the value of the unit by the number of units.  $200 \times 5$ .

You have the answer.

She made  
1000 pancakes.