



# *Math in Focus: Singapore Math* Parent University

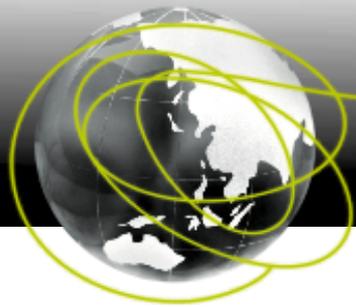
Ian Kerr

WCASD Math Supervisor

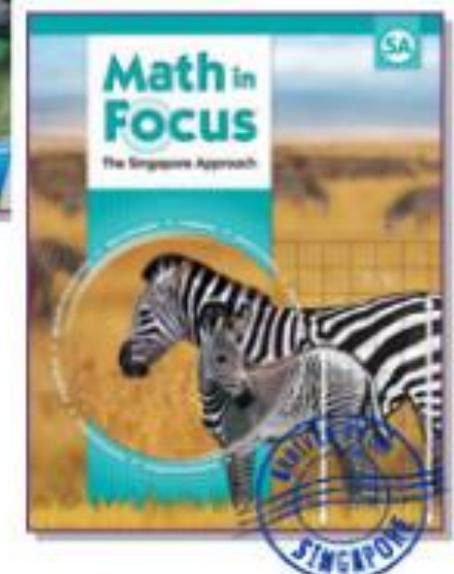
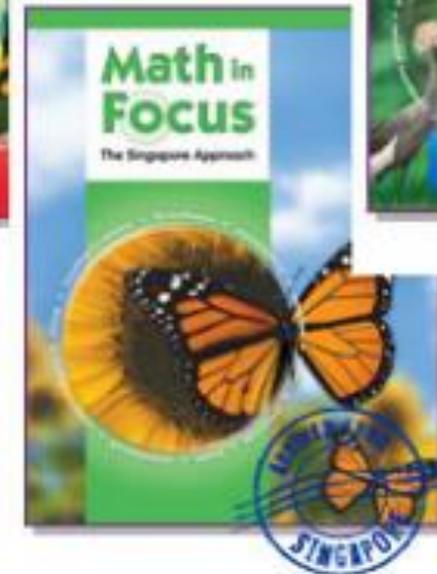
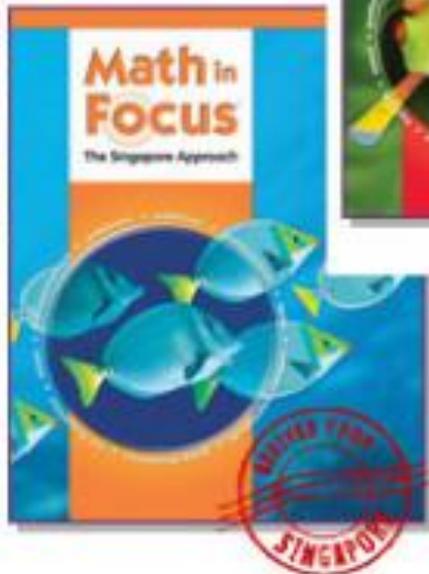
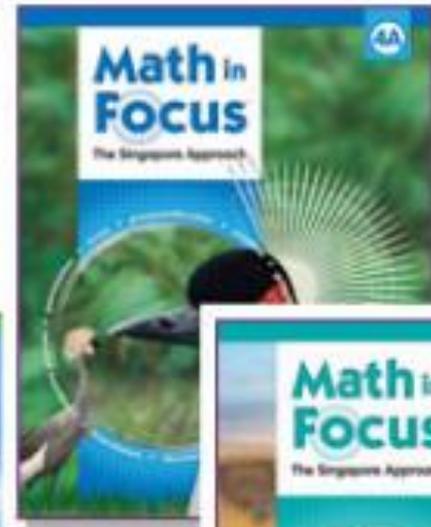
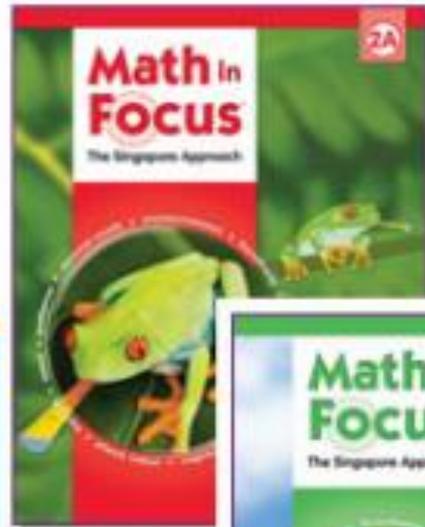
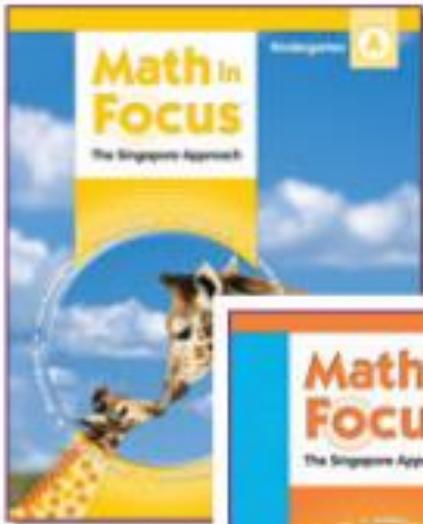
The bulgy chinzels slottled prazily  
over the flubbish wub.

Questions:

1. What did the bulgy chinzels do?
2. How did they slottle?
3. Where did they slottle?
4. What kind of chinzels were they?



# Math in Focus



# Singapore



# Singapore

A WORLD LEADER IN MATH EDUCATION

1	Hong Kong	607
2	Singapore	599
3	Japan	586
4	Chinese Taipei	576
5	Kazakhstan	549
6	Russian Federation	544
7	England	541
8	Lativa	537

9	Netherlands	535
10	Lithuania	530
11	United States	529
12	German	525
13	Denmark	523
14	Australia	516
15	Hungary	510

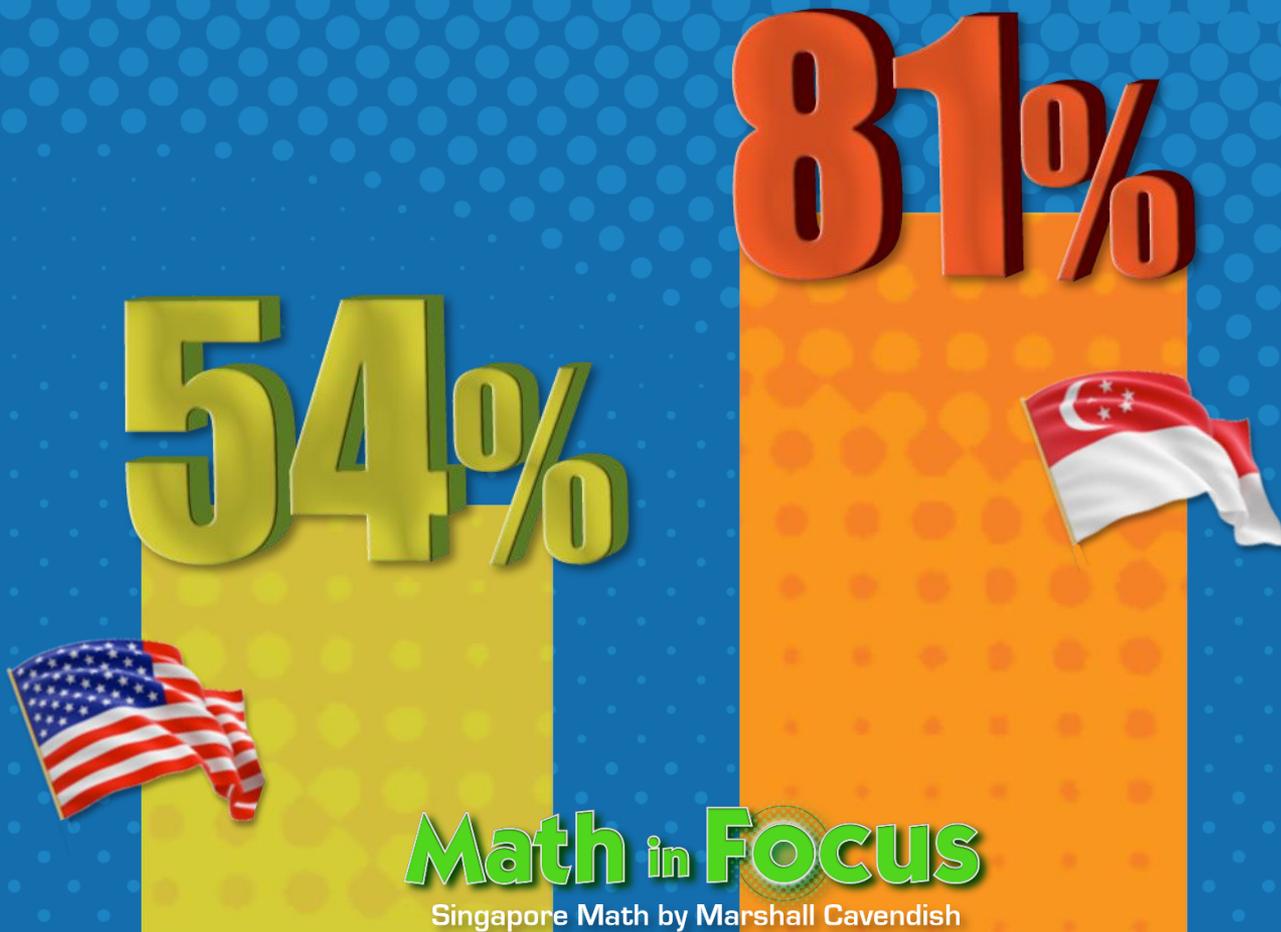
# Singapore

A WORLD LEADER IN MATH EDUCATION

COUNTRY	KNOWING	APPLYING	REASONING
Singapore	590	620	578
Taipei	569	584	566
Japan	566	565	563
Kazakhstan	547	559	539
Russia	547	538	540
England	540	544	537
United States	524	541	526

## TIMSS, grade 4

In Toshi's class there are twice as many girls as boys. There are 8 boys in the class. What is the total number of boys and girls in the class?



# TIMSS, grade 8

The length of a rectangle is 6 cm and its perimeter is 16 cm. What is the area of the rectangle in square centimeters?

22%

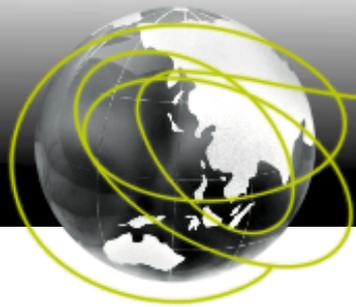


86%



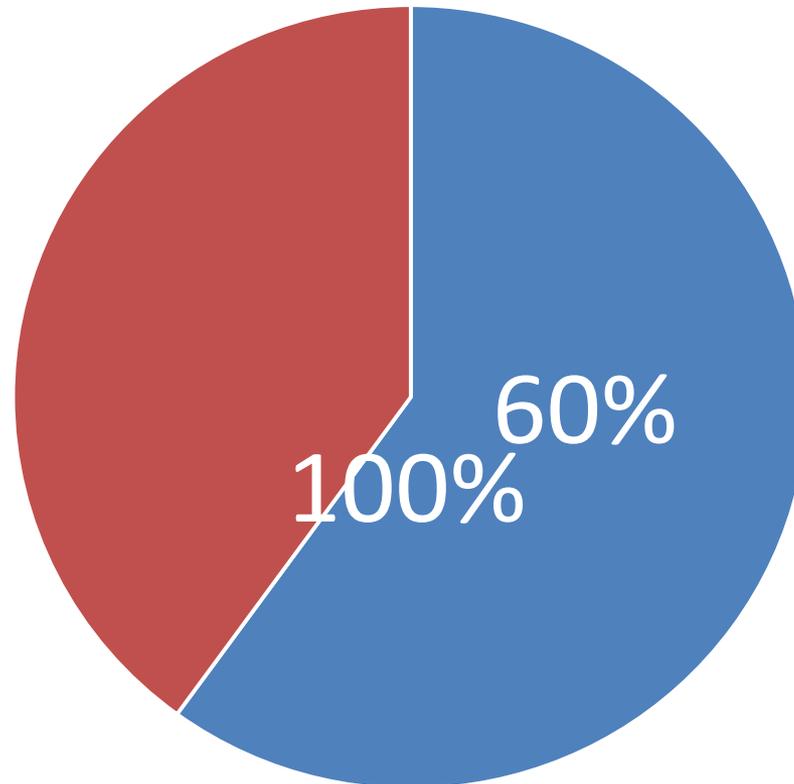
**Math in Focus**

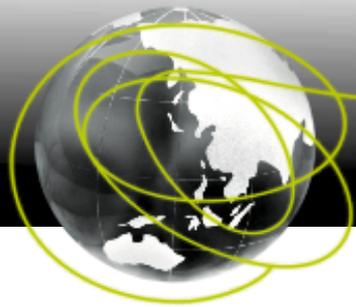
Singapore Math by Marshall Cavendish



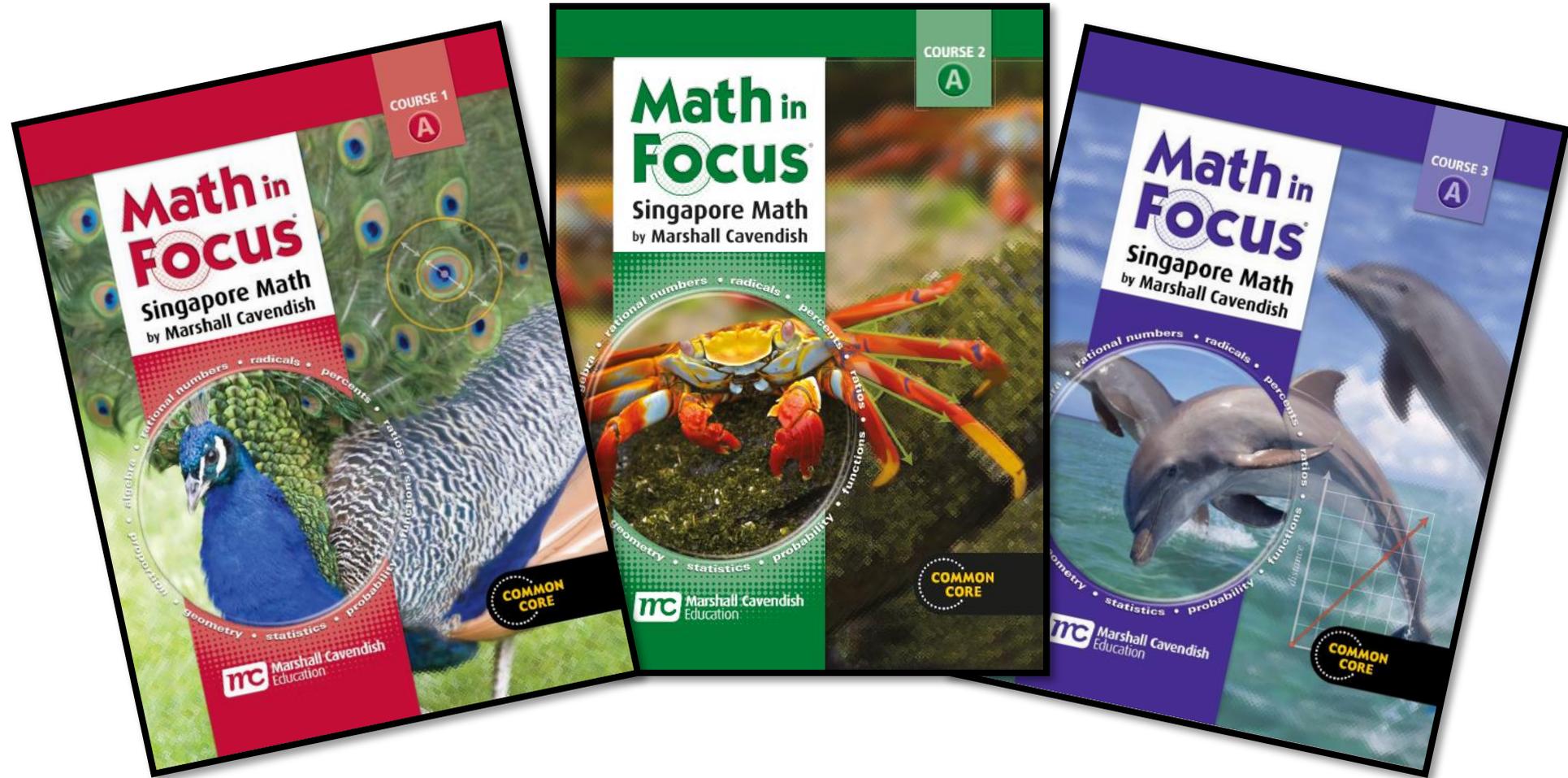
# Why *Math in Focus*?

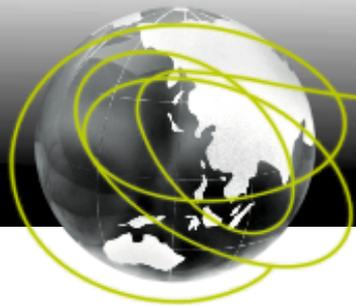
Percent of Assessed Content  
Taught in Singapore





# Why Math in Focus?



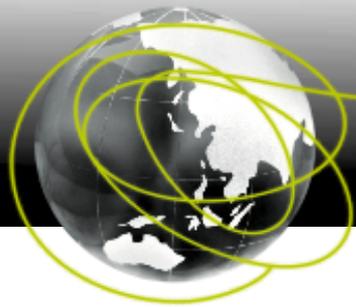


# Singapore's Methodology

## Interlocking Concepts and Skills

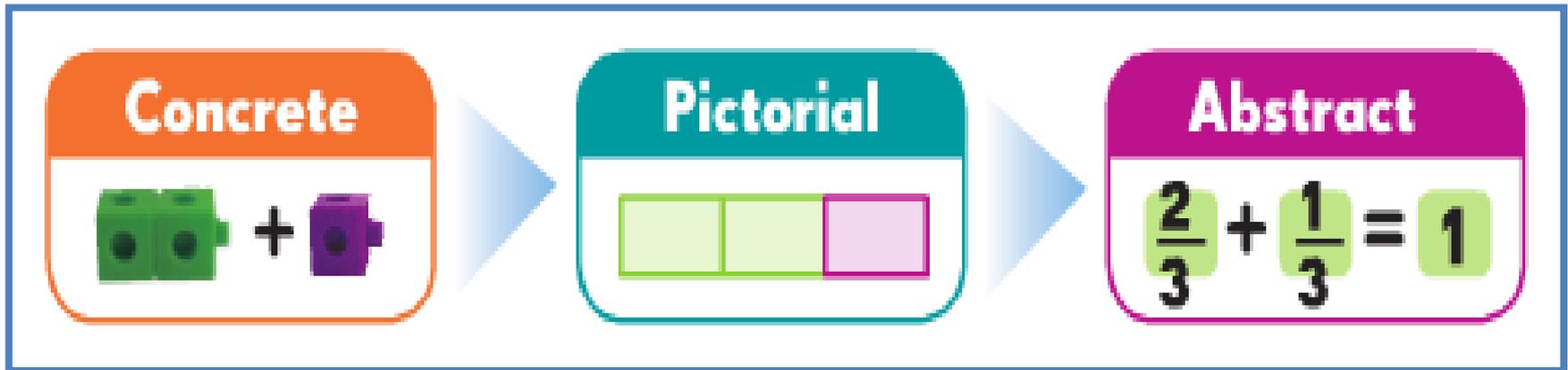


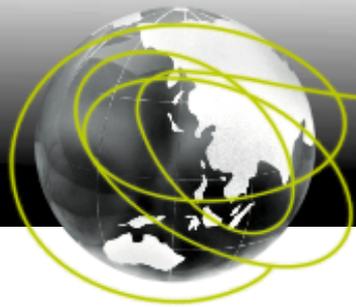
From “*remembering how*” to “*understanding why*”



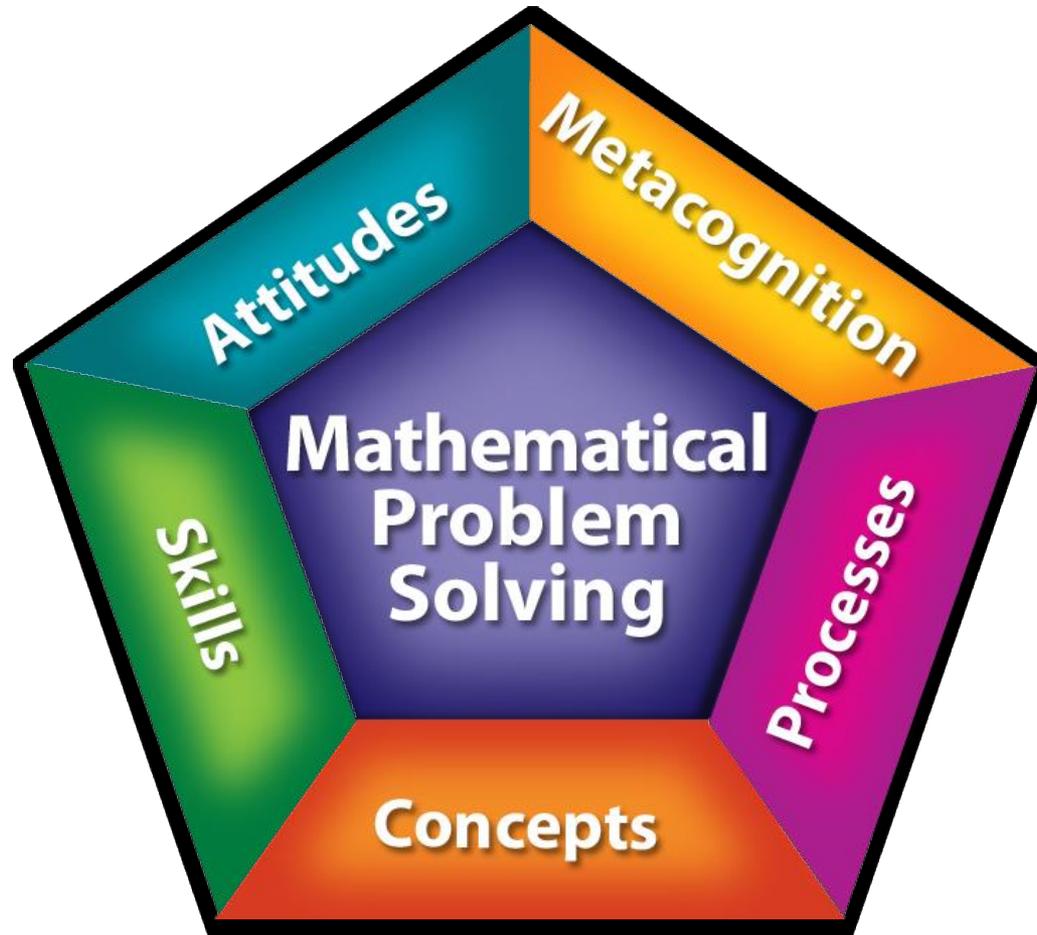
# Singapore's Methodology

Clear Visuals and Use of Models



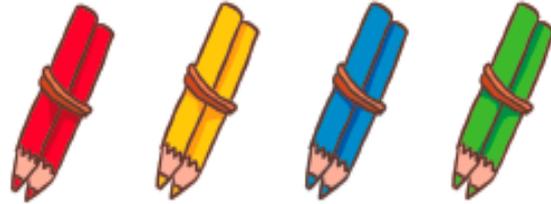


# Singapore Framework



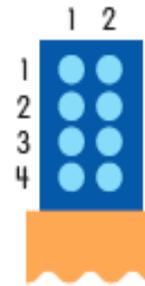
Use dot paper to find the missing numbers.

- 1 Sam has 4 bundles of pencils.  
Each bundle has 2 pencils.  
How many pencils does he have in all?



$4 \times 2 =$

Sam has  pencils in all.



Problem Solving

Skills

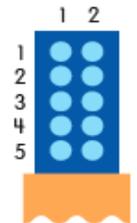
Concepts

Processes

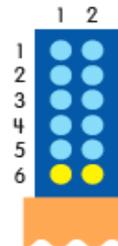
**Learn** You can use multiplication facts you know to find other multiplication facts.

$6 \times 2 = ?$

Start with 5 groups of 2.



$5 \times 2 = 10$



$6 \times 2 = 5 \text{ groups of } 2 + 1 \text{ group of } 2$   
 $= 10 + 2$   
 $= 12$

$6 \times 2$  is the same as adding 1 group of 2 to  $5 \times 2$ .



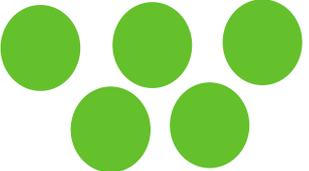
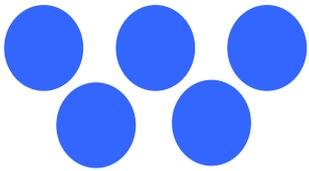
Metacognition

Attitudes

$$525 \div 3 =$$



# Long Division

Hundreds	Tens	Ones
		

$$525 \div 3$$



# Long Division

Hundreds	Tens	Ones
●	● ●	● ● ● ● ●
●	● ● ● ● ● ● ● ●	
●	● ● ● ● ● ● ● ●	

$$525 \div 3$$



# Long Division

Hundreds	Tens	Ones

$$525 \div 3$$



# Long Division

Hundreds	Tens	Ones
●	●●●	●●●
●	●●●●	●●●
●	●●●●	●●●

$$\begin{array}{r} \boxed{1} \boxed{7} \boxed{5} \\ 3 \overline{) 525} \\ \underline{300} \\ 225 \\ \underline{210} \\ 15 \end{array}$$



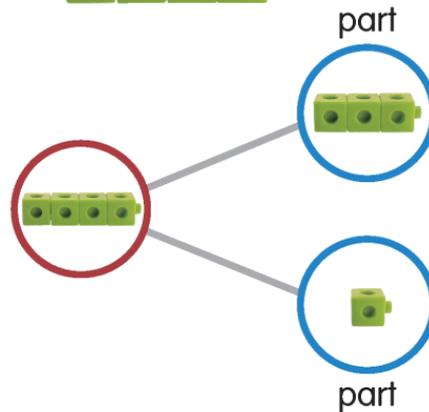
# Number Bonds

Learn

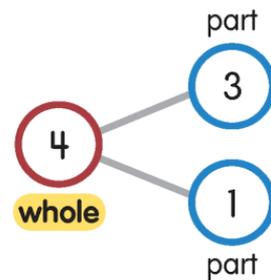
You can make number bonds with .

You can use a number train to make number bonds.

Sam put  into two parts.



How many are in each **part**?



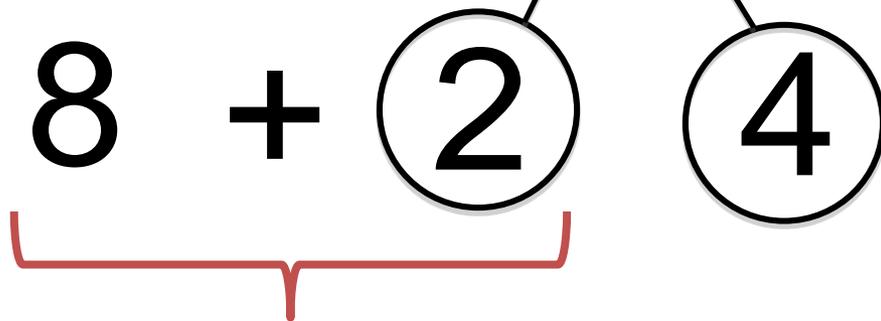
3 and 1 make 4.

This picture shows a **number bond**.



# Number Bonds

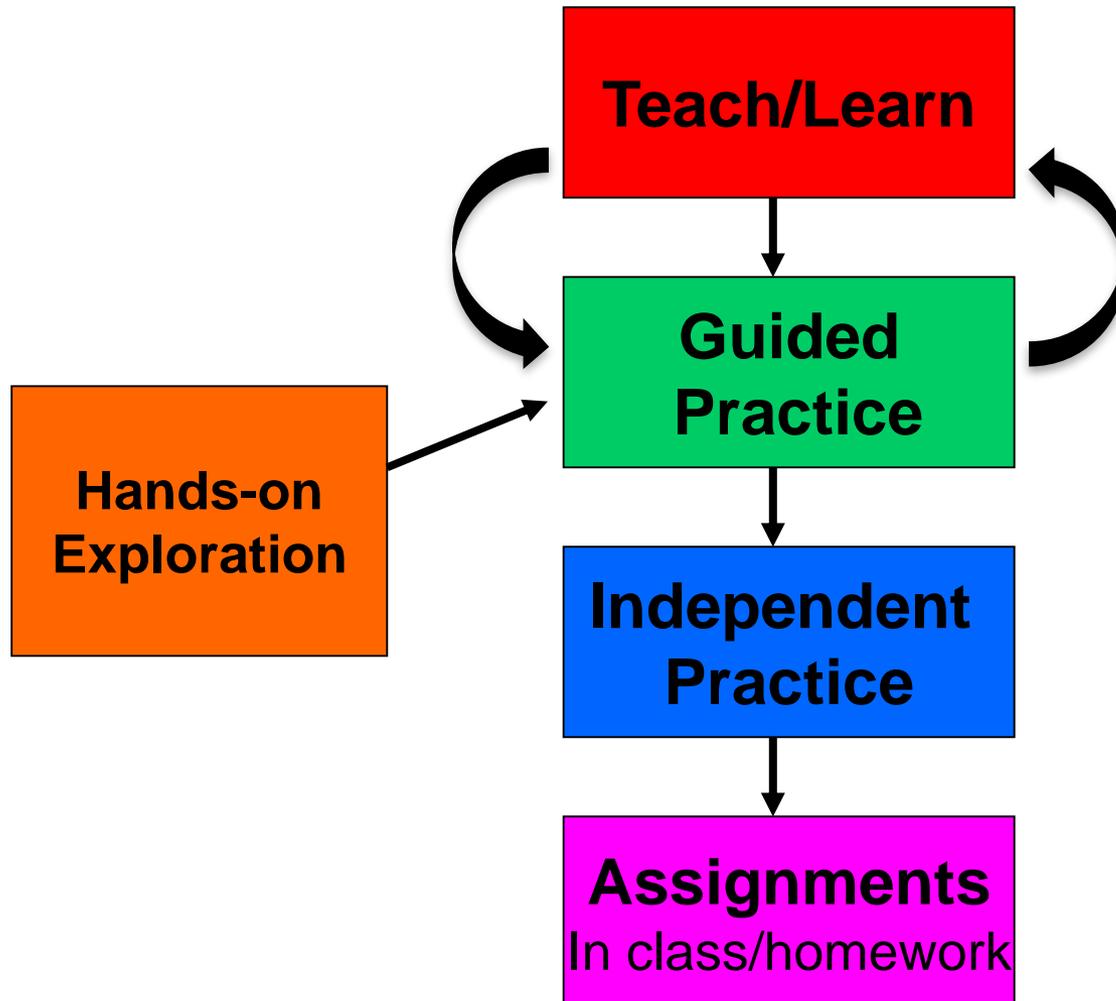
$$8 + 6 =$$



$$10 + 4$$



# Lesson Structure





# Singapore's Methodology

## Focus and Depth



### Numbers to 10,000

<b>Chapter Overview</b> .....	1A
<b>Differentiation Resources</b> .....	1B
<b>Assessment and Remediation</b> .....	1C
<b>Chapter Planning Guide</b> .....	1D
<b>Chapter Introduction</b> .....	1
<b>Recall Prior Knowledge</b> and <b>Quick Check</b> Counting • Place value.....	2–3

#### 1.1 Counting **2 DAY** Lesson ..... 5

**Learn** Use base-ten blocks to show numbers • express a number in different forms • Count to ten thousand • Count on by ones • Count on by tens • Count on by hundreds • Count on by thousands

**Let's Practice** and **Practice and Apply** Workbook A: Practice 1 ..... 10–11

#### 1.2 Place Value **2 DAY** Lesson ..... 12

**Learn** Use a place-value chart and place-value strips to find the value of each digit in a number

**Game** Roll and Show!

**Learn** Use a place-value chart and base-ten blocks to show greater numbers

**Let's Practice** and **Practice and Apply** Workbook A: Practice 2 ..... 18–19

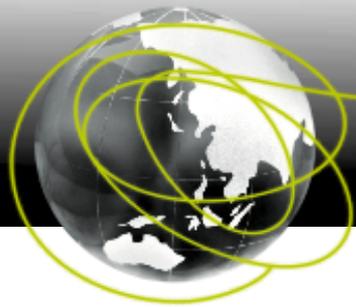


# Singapore's Methodology

## Focus and Depth

A comparison from the  
American Institute for Research:

	NO. OF CHAPTERS	NO. OF LESSONS	AVG PAGES PER LESSON
Singapore Math	18	34	15
Typical American Program	29	157	4



# Program Components

- Manipulatives
- Student Activity Books
- Extra Practice
- Re-teach
- Enrichment
- Textbooks

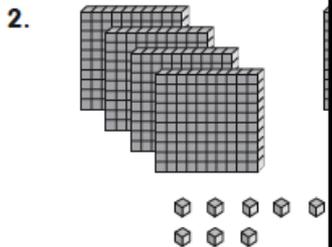
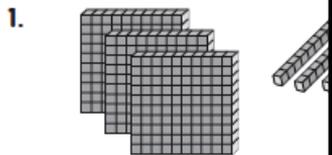
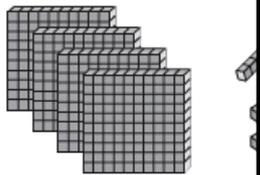
# CHAPTER 1

## Numbers

### Practice 1 Counting

Write the numbers shown.

Example



Name: \_\_\_\_\_

# CHAPTER 1

## Numbers

### Worksheet 1 Counting

What is the number shown by the base-ten blocks?  
Write the number in words.



Count on by ones.  
Use base-ten blocks to help.

2. 28, 29, \_\_\_\_\_, 31, \_\_\_\_\_

Count on by tens.  
Use base-ten blocks to help.

3. 22, 32, \_\_\_\_\_, \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

2. Five children play a game of pinball.  
How many points does each of them score?  
Read the clues.  
Then fill in the blanks.

#### Clues

- Kelly scores 590 points.
- Steven comes in last.
- Tammy scores 100 points less than 930.
- Gina misses a shot worth 100 points, so she does not score 650 points.
- Elle is one of the players.

#### Pinball Challenge Hall of Fame

Name	Score
_____	830
_____	284
_____	125
_____	550
_____	590



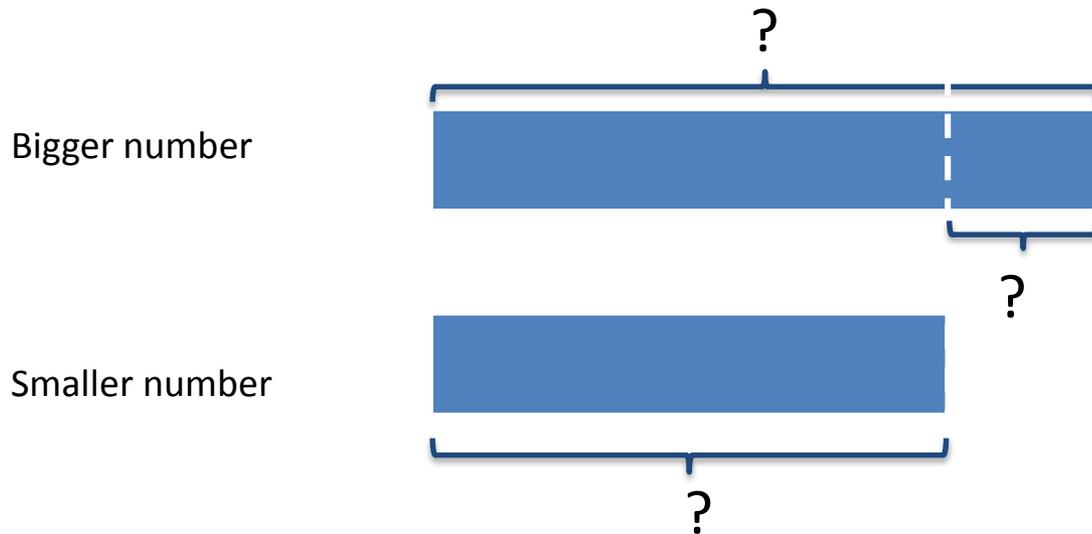
# Use of Assessments

- Formative vs. Summative
- Novel Problems



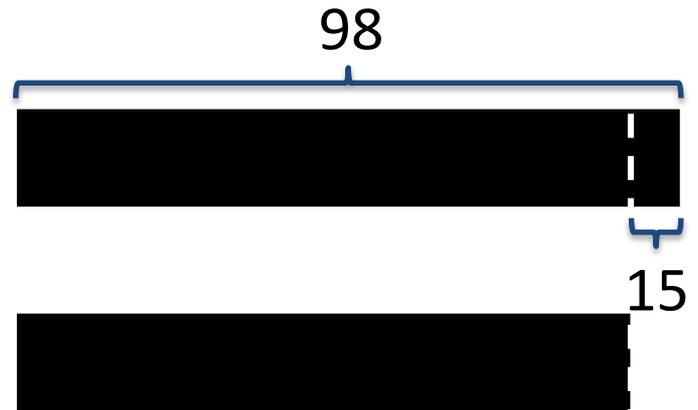
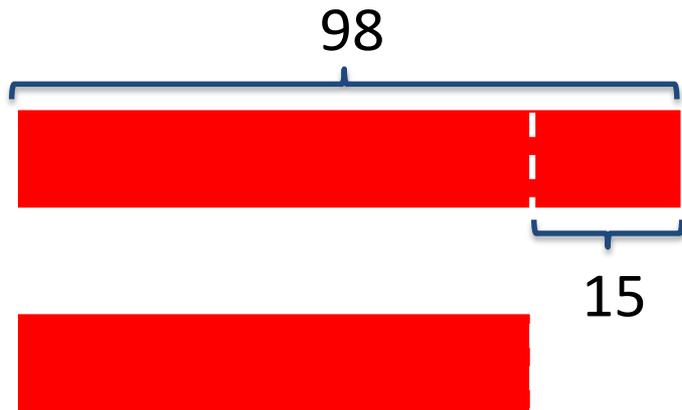
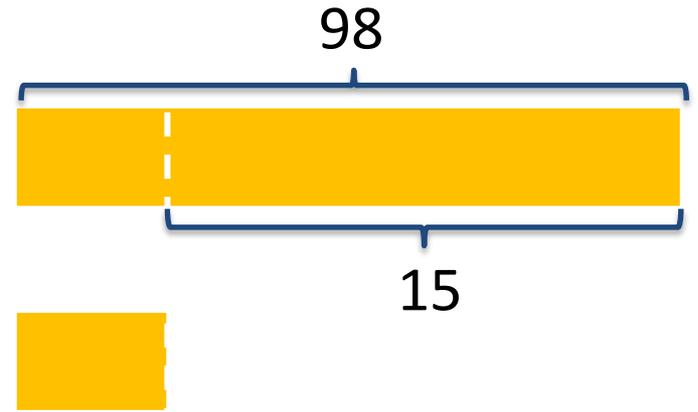
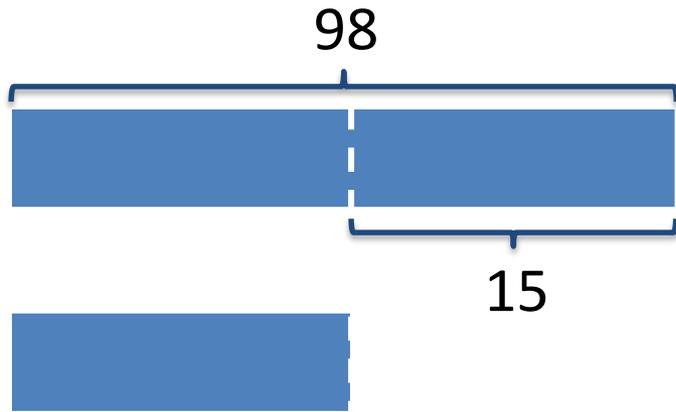
# Supporting visuals, Specific language

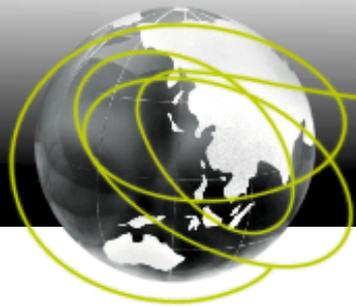
The difference between two numbers is \_\_\_\_\_. If the bigger number is \_\_\_\_\_, what is the smaller number?





# Supporting visuals, Specific language



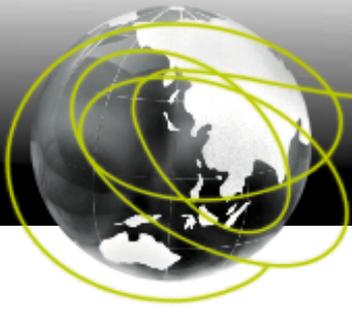


# Fractions, Fractions, Fractions

$$1 \text{ } ^s \text{ } \frac{1}{2}$$

$$\frac{1}{2} \text{ } ^s \text{ } \frac{1}{4}$$

$$3 \text{ } ^s \text{ } \frac{2}{3}$$



# Fractions, Fractions, Fractions

$$\frac{1}{2} + \frac{1}{3}$$



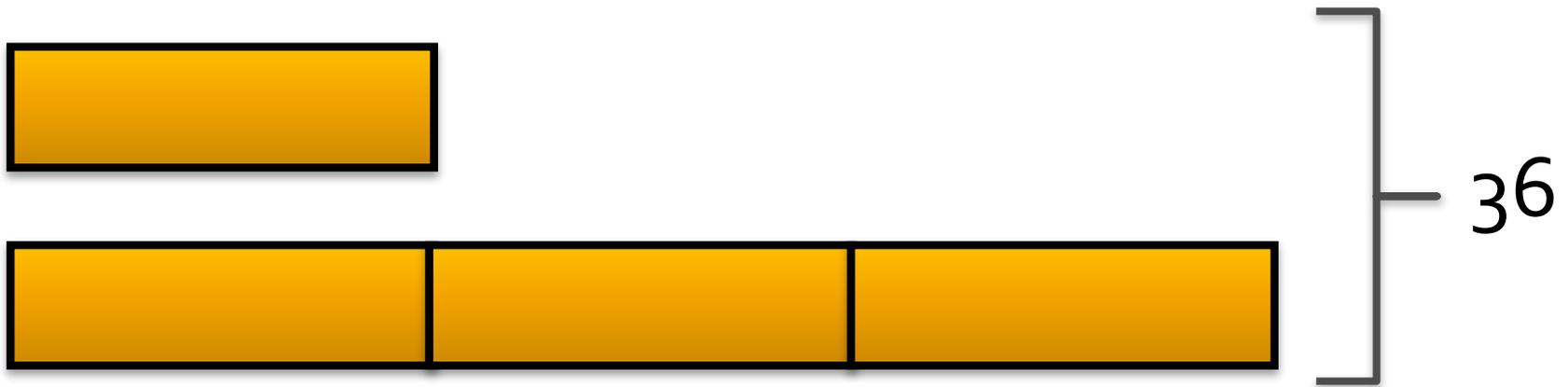


# Supporting visuals, Specific language

The sum of two numbers is 36.

The smaller number is  $\frac{1}{3}$  of the larger number.

Find the two numbers.

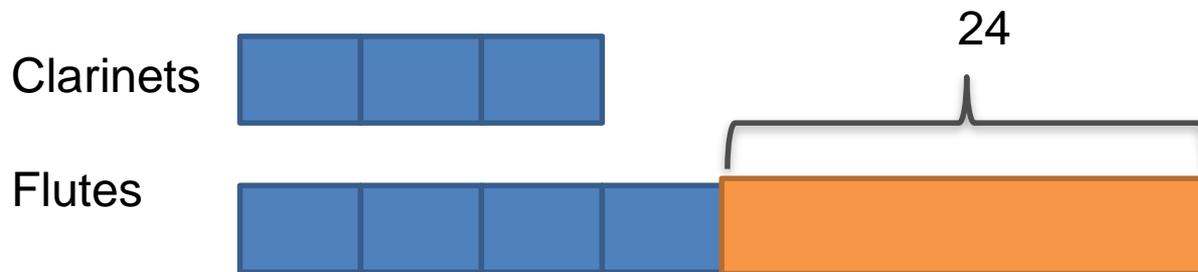


$$x + 3x = 36$$

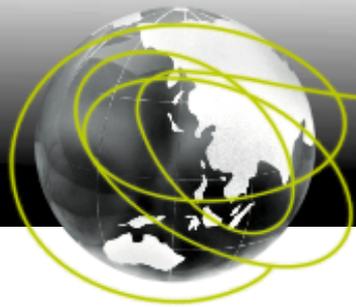


# Supporting visuals, Specific language

In a music room, the ratio of the number of clarinets to the number of flutes was 3:4. After the school bought another 24 flutes, the ratio became 3:8. How many clarinets were there in the music room?



$$\frac{3x}{4x + 24} = \frac{3}{8}$$



# Beyond Math in Focus

Ability to apply Mathematics

Ability to Reason Algebraically

Ability to Persevere

The Art of Questioning



# SCHOOL to HOME

## Connections

### Chapter 2 Addition up to 1,000

#### Dear Family,

In this chapter, your child will learn to add numbers up to 1,000. Some of the skills your child will practice are:

- using place-value charts to add numbers with and without regrouping
- solving real-world addition problems

#### Activity Use Grids to Add

As children start working with greater numbers, they must be able to use the vertical form correctly to add.

Write the numbers 278 to 281 on a sheet of paper.

On another sheet of paper, draw a grid like the one shown.

	2	7	8
+	2	7	9
	5	5	7

- Ask your child to use the grid to add two numbers at a time, for example,  $278 + 279$ , or  $278 + 280$ , and so on.
- Ask your child to find the two numbers which give the greatest number and the least number when added.  
(Adding the two greatest numbers, 280 and 281, gives the greatest sum and adding the two least numbers, 278 and 279, gives the least sum.)

#### Vocabulary to Practice

This place-value chart shows the number 326.

Number	Hundreds	Tens	Ones
326	3	2	6

To **regroup** numbers when adding, you change:

- 10 ones to 1 ten
- 10 tens to 1 hundred

For example,

$$\begin{array}{r} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{0} \phantom{0} \phantom{0} \\ + 3 \phantom{0} \phantom{0} \\ \hline 6 \phantom{0} \phantom{0} \end{array}$$



# Online Components



Subject: All

Grade: All

## Resources



Math in Focus  
Teacher eBook G5



Math in Focus  
Teacher eBook G2



Math in Focus  
Student Workbook  
eBook, G1



Math in Focus  
Teacher eBook G4



Math in Focus  
Teacher eBook G1



Math in Focus  
Teacher eBook G3



Math in Focus  
Teacher eBook GK



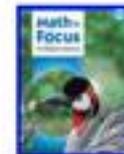
Math in Focus Pupil  
eBook, G5



Math in Focus Pupil  
eBook, G2



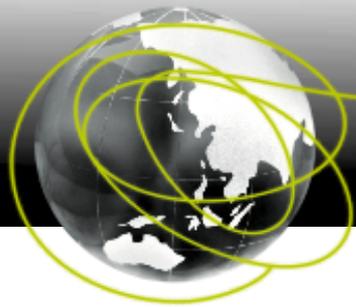
Math in Focus Pupil  
eBook, GK



Math in Focus Pupil  
eBook, G4



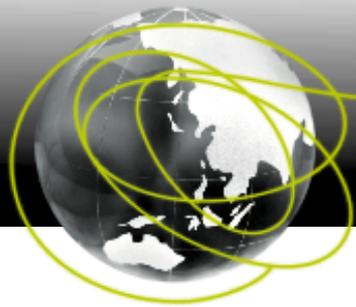
Math in Focus Pupil  
eBook, G3



# Additional Resources

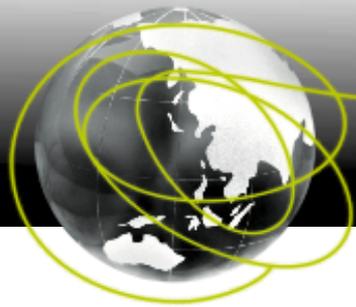
<http://www.mathplayground.com/thinkingblocks>

[www.thesingaporemaths.com](http://www.thesingaporemaths.com)



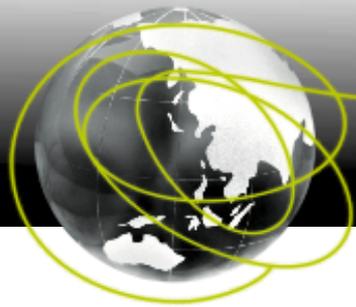
# Learning along the way...

- It's not exactly how WE learned Math
- Transitions to a new program are never seamless
- **Visualization** of numbers
- Use of Assessments
  - Novel Problems



# Learning along the way...

- Rigor
- Endurance
- There's not a 'catch all' problem-solving process
- Standards-aligned



# Learning along the way...

- We're not alone
  - Downingtown
  - Episcopal Academy
  - Great Valley
  - Haverford
  - T/E
  - Unionville (K-8)
  - Wallingford-Swarthmore (K-8)
  - Westtown School



# Using a Bar Model

Ricardo spends  $\frac{8}{9}$  hour reading the newspaper. He spends  $\frac{1}{4}$  of the time reading the world news and splits the remaining time equally between the sports news and the comics. How much time does he spend reading the comics?





# Using a Bar Model

Ricardo spends  $\frac{8}{9}$  hour reading the newspaper. He spends  $\frac{1}{4}$  of the time reading the world news and splits the remaining time equally between the sports news and the comics. How much time does he spend reading the comics?



**Ricardo reads comics for  $\frac{1}{3}$  of an hour**

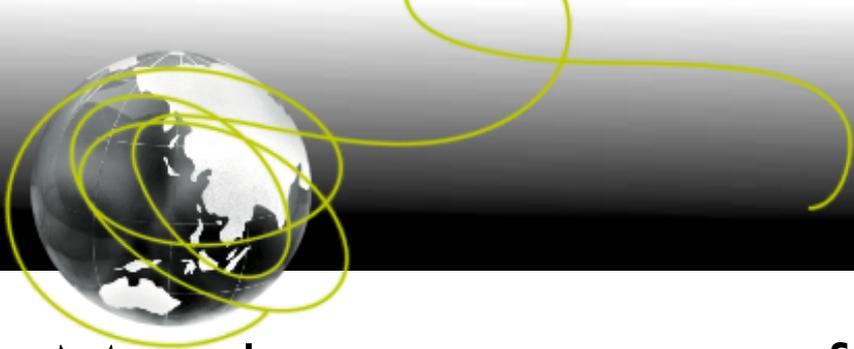


# Using a Bar Model

Ricardo spends  $\frac{8}{9}$  hour reading the newspaper. He spends  $\frac{1}{4}$  of the time reading the world news and splits the remaining time equally between the sports news and the comics. How much time does he spend reading the comics?



$$\frac{8}{9} - \frac{1}{4} = 2$$



# Ratios

Meghan prepares fruit punch using apple, orange and grape juice in the ratio 5 to 3 to 2. If there are 150 oz more apple juice than grape juice, how many oz of juice are there all together?

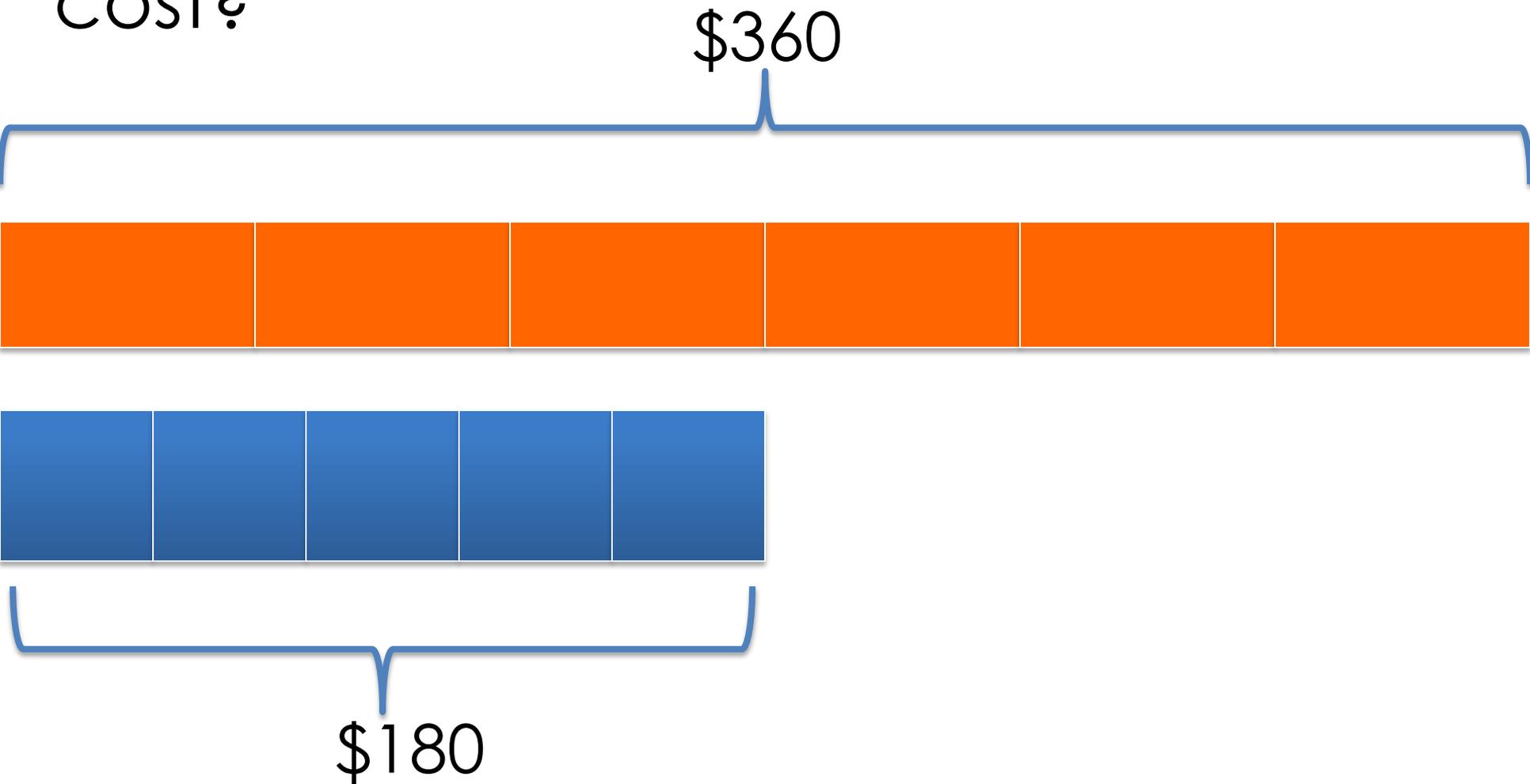


A bicycle store sells  $\frac{4}{7}$  of the mountain bikes in the store. Then only 24 mountain bikes remain. How many mountain bikes were there originally?



There were 56 bikes originally.

Three similar tables cost as much as five similar chairs. If six tables cost \$360, how much would each chair cost?



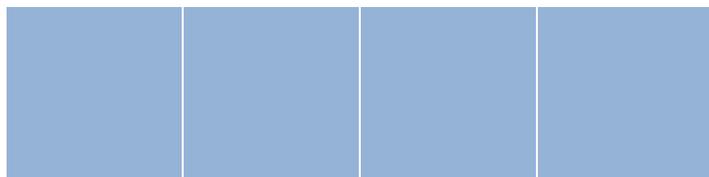
Mary had  $\frac{1}{4}$  as much money as Nancy. Pat had \$24 more than Nancy. They had \$168 all together. How much money did Pat have?

**Mary had  $\frac{1}{4}$  as much money as Nancy.** Pat had \$24 more than Nancy. They had \$168 all together. How much money did Pat have?

**Mary**

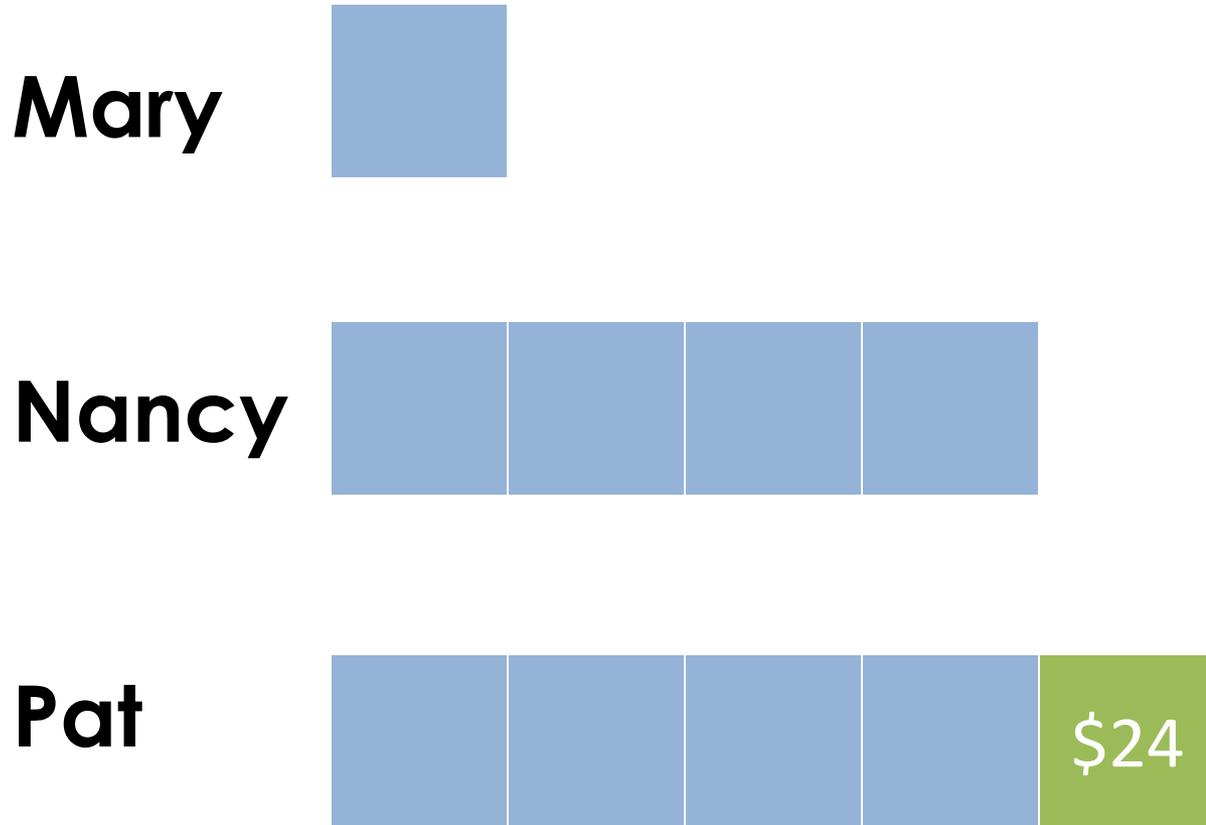


**Nancy**

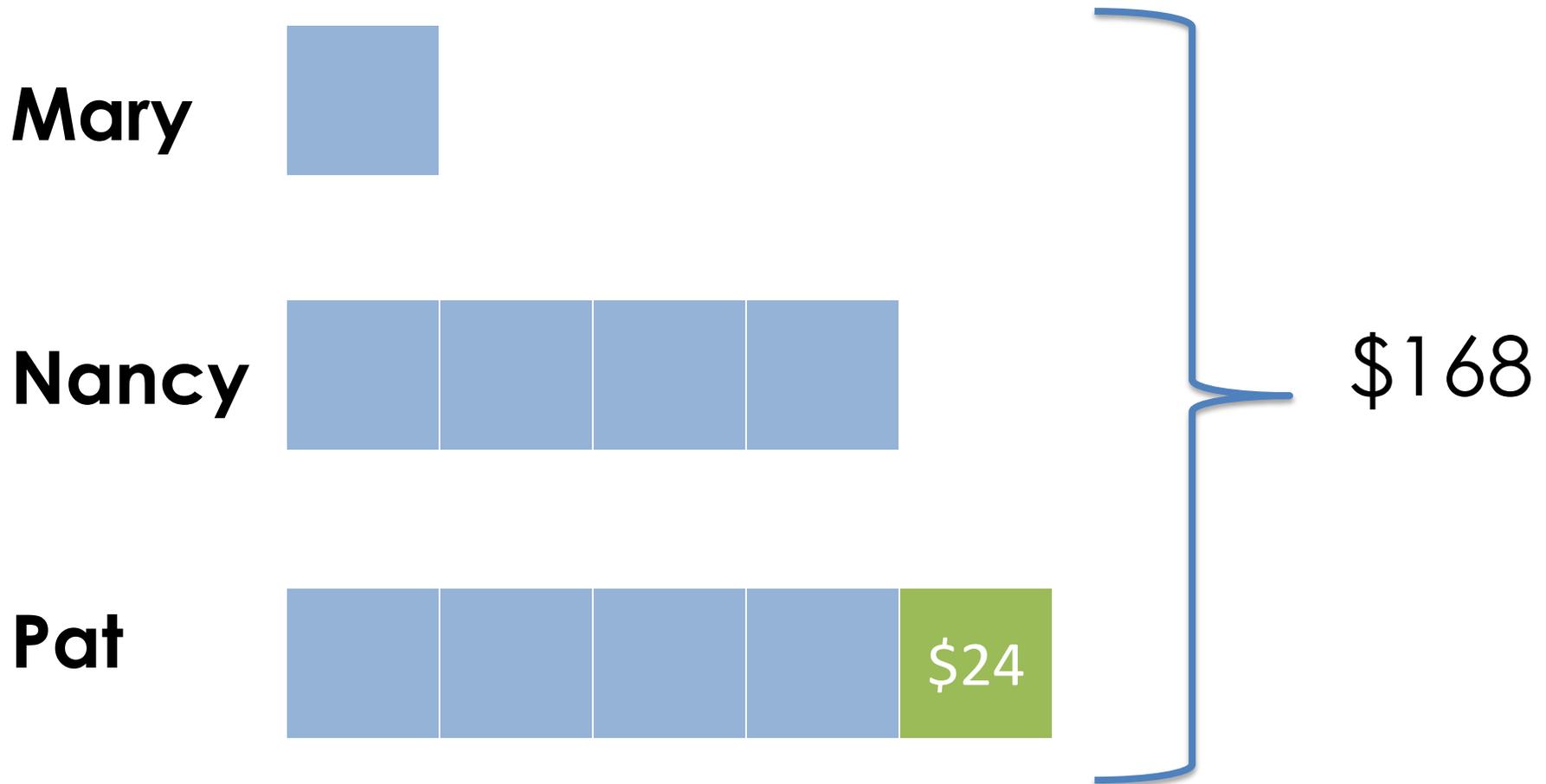


**Pat**

Mary had  $\frac{1}{4}$  as much money as Nancy. **Pat had \$24 more than Nancy.** They had \$168 all together. How much money did Pat have?

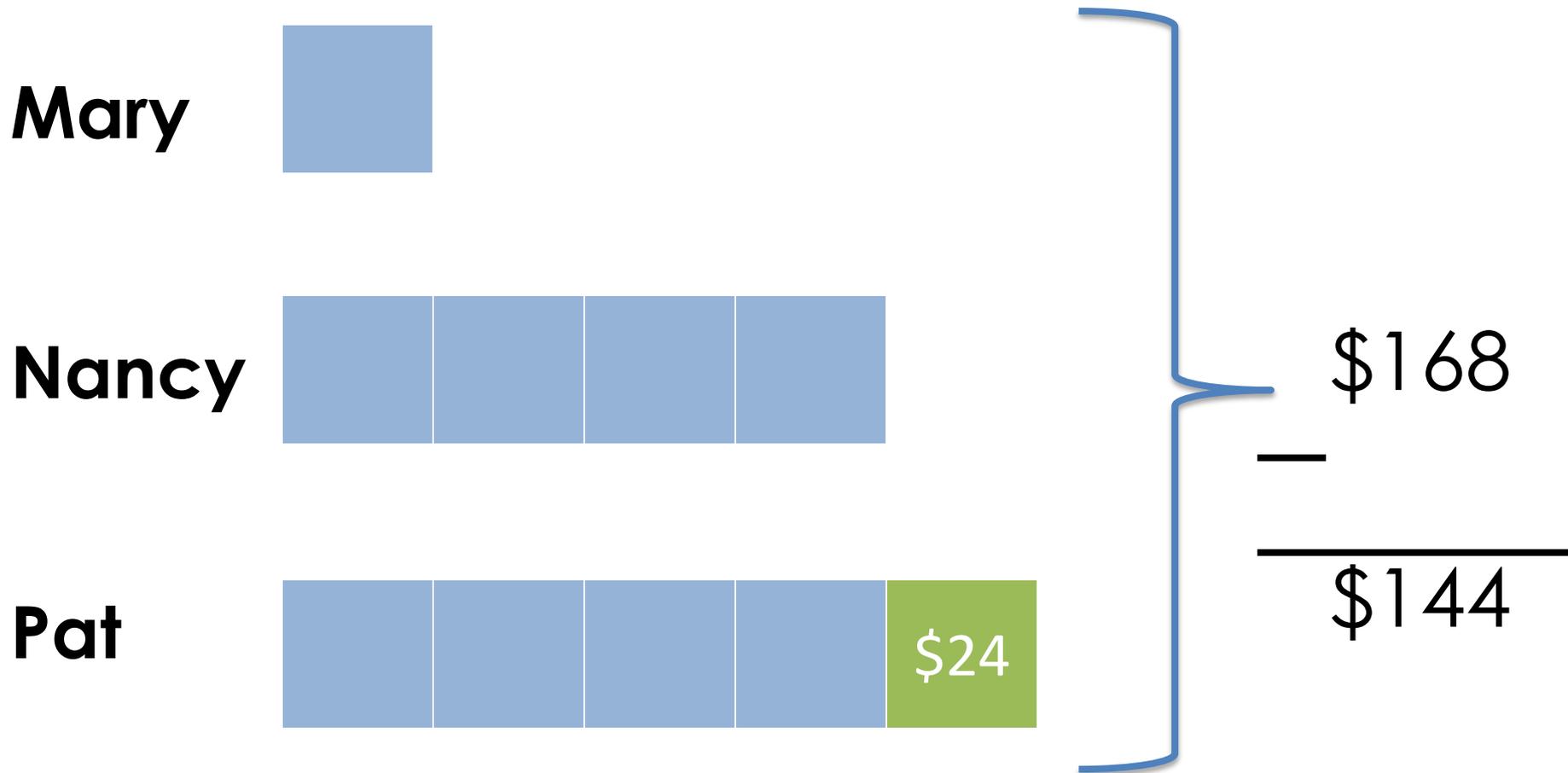


Mary had  $\frac{1}{4}$  as much money as Nancy. Pat had \$24 more than Nancy. **They had \$168 all together.** How much money did Pat have?

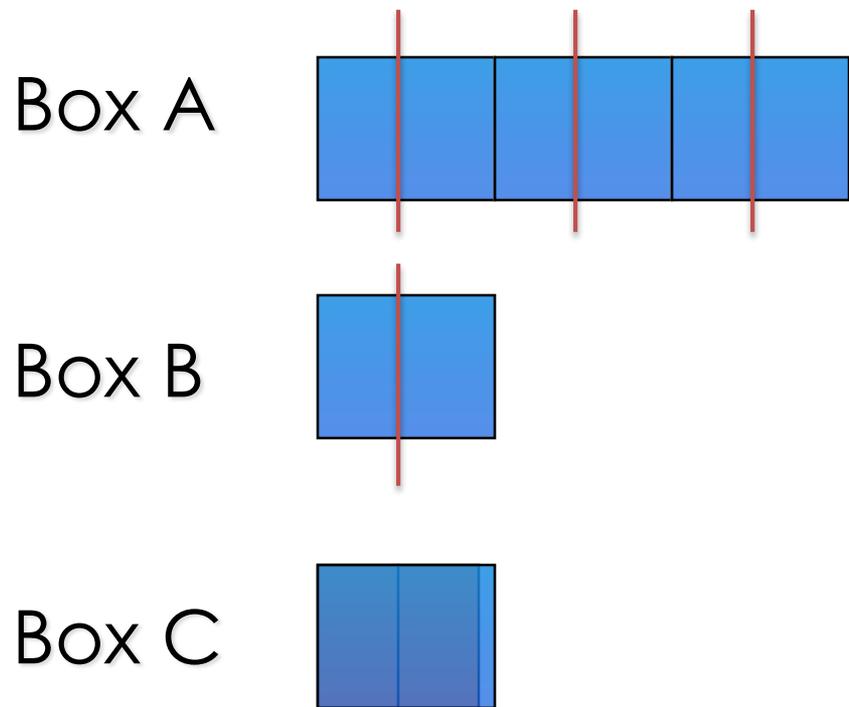


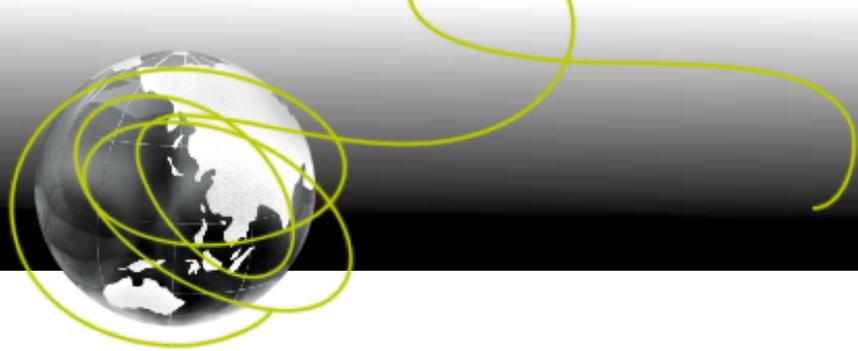
Mary had  $\frac{1}{4}$  as much money as Nancy. Pat had \$24 more than Nancy. They had \$168 all together.

**How much money did Pat have?**



There were three times as many oranges in Box A as in Box B. Box B contained twice as many oranges as Box C. If the total number of oranges was 72, how many more oranges were there in Box A than in Box C?





# Fractions

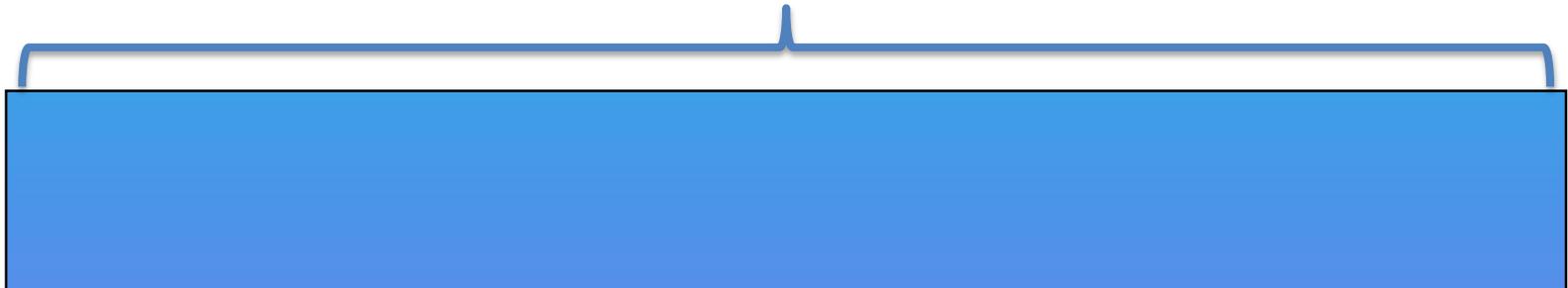
Carter has 9 pounds of sand to put in fish tanks. He uses 5 pounds of sand for a large fish tank and puts the rest equally in the small fish tanks. If he puts  $\frac{1}{3}$  pound of sand in each small fish tank, how many fish tanks does he put sand into?



# Fractions

**Carter has 9 pounds of sand to put in fish tanks.** He uses 5 pounds of sand for a large fish tank and puts the rest equally in the small fish tanks. If he puts  $\frac{1}{3}$  pound of sand in each small fish tank, how many fish tanks does he put sand into?

9 lb

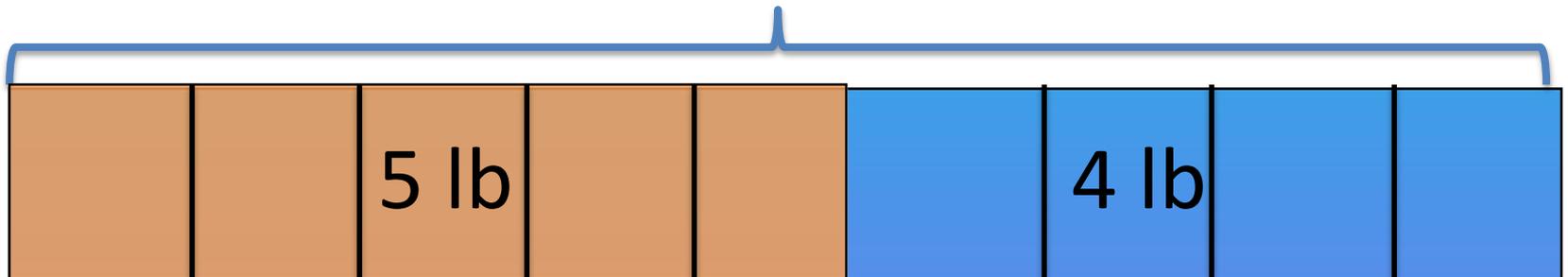




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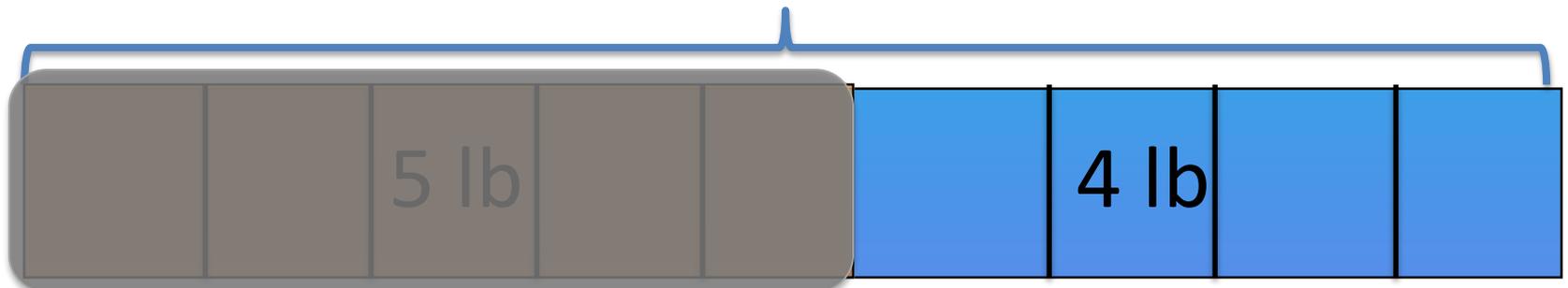




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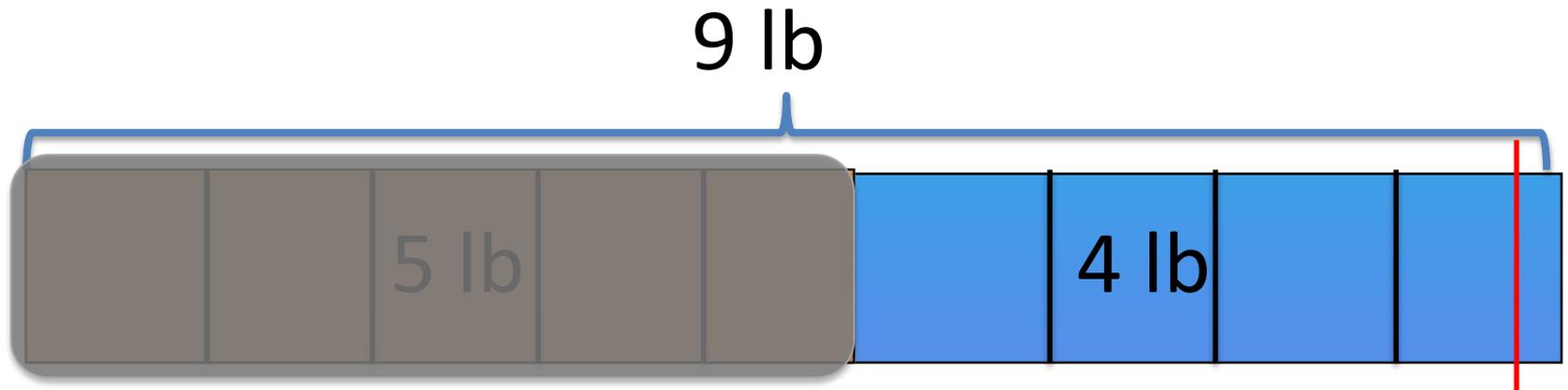
9 lb





# Fractions

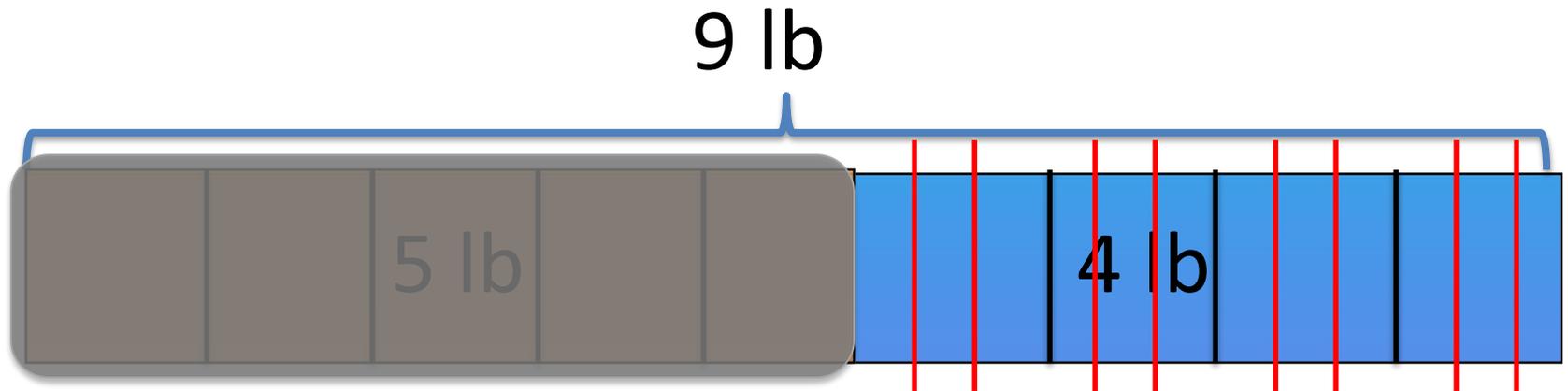
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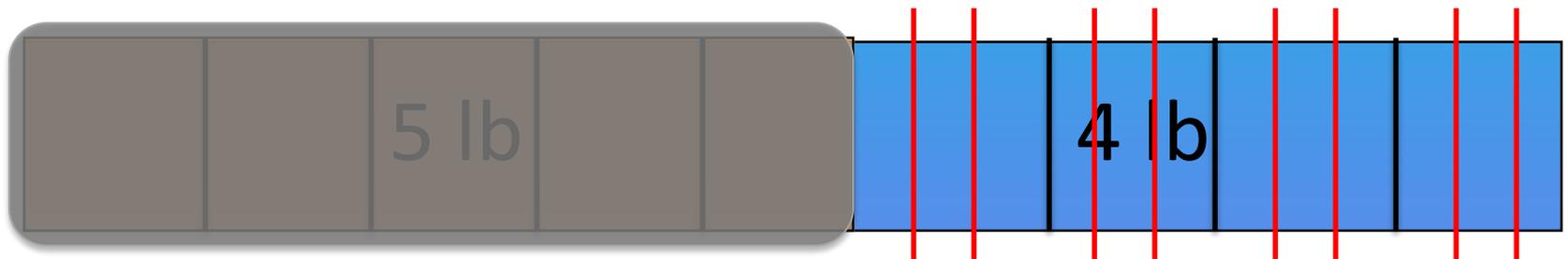




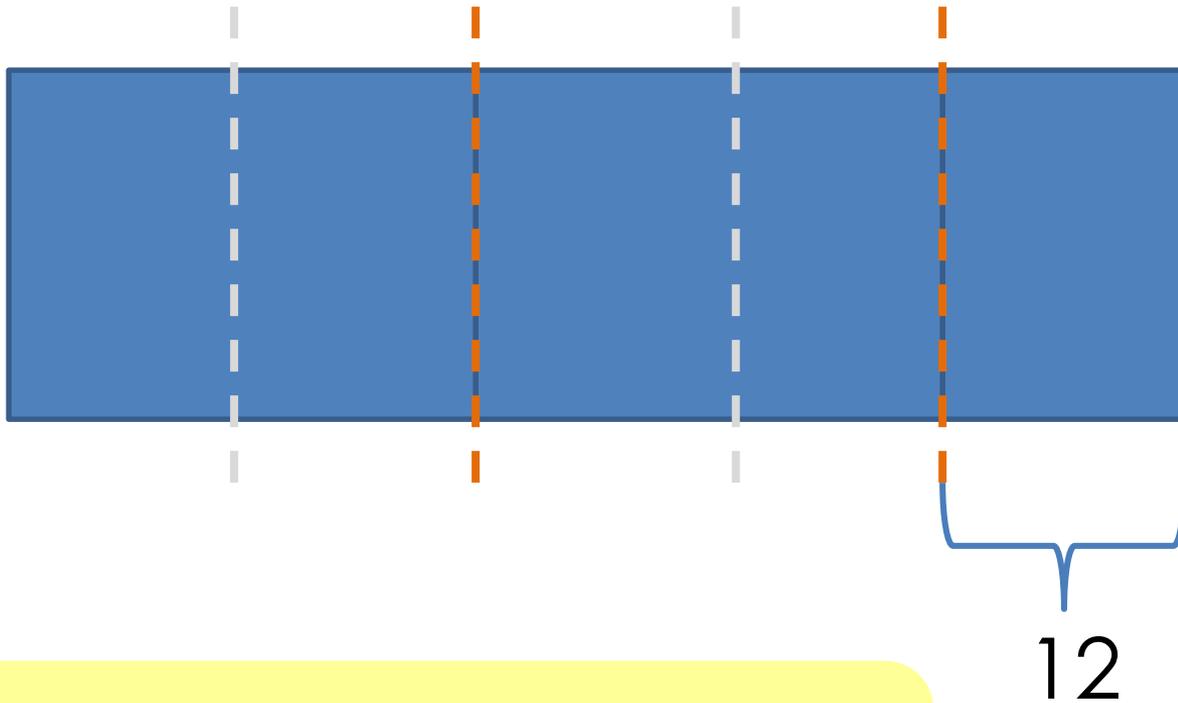
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**He put sand into 13 fish tanks.**



250% of a number is 60. Find the number.



$$2.5x = 60 \quad \frac{250}{100} = \frac{60}{?}$$