

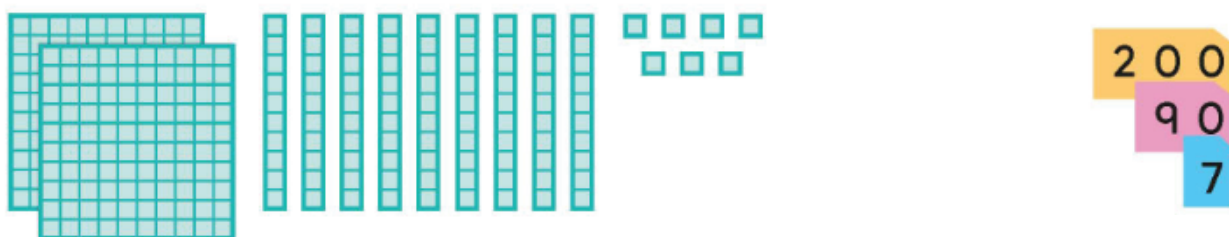
Developing a Strong Foundation

The instructional strategies in Primary Mathematics were created based on global research and best practices on how students develop understanding from an early age. The consistent use of the Concrete-Pictorial-Abstract approach and powerful visual models across chapters and grade levels help students to connect ideas and build upon their mathematical understanding. As students engage with these models, they develop a strong foundation that ensures successful progress to mastery.

The Concrete-Pictorial-Abstract Approach

The Concrete-Pictorial-Abstract approach allows students to “see” and make sense of abstract mathematical concepts.

In the CONCRETE stage, students use physical objects, or math manipulatives, to explore a new concept.



In the PICTORIAL stage, students see the same mathematical concepts represented in diagrams or visual models. They learn that models are strategic representations to understand quantities and relationships between numbers.

Hundreds	Tens	Ones
4	9	1
4	8	9

In the ABSTRACT stage, students connect their concrete and pictorial representations to abstract mathematical symbols such as numbers and operations.

- (a) 4,206 4,026
- (b) 9,005 9,050
- (c) 5,843 5,000 + 800 + 40 + 3

Primary Mathematics includes point-of-use instruction in the Teacher’s Guide to aid in the use of the Concrete-Pictorial-Abstract approach. Visual models and manipulatives are clearly described in the Chapter Overview. The Chapter Progression lists visuals of each stage for every lesson in the chapter.

CHAPTER OVERVIEW provides embedded professional development by providing insights into the Key ideas of the chapter. Concrete-Pictorial-Abstract Progression provides an overview of the materials used, and pictorial and abstract representations students will encounter in the chapter.

Chapter Overview

Concrete-Pictorial-Abstract Progression

In this chapter, students’ knowledge from Grade 4 of numbers to 1,000,000 is extended to understanding numbers to 10 million. Students will also learn to multiply and divide by tens, hundreds, thousands, and powers of 10.

Throughout the chapter, students will have multiple experiences working with concrete materials such as place-value chips and place-value strips. The use of concrete materials provides hands-on opportunities for students to build and extend their understanding of numbers to 10 million.

Key Ideas

- Multi-digit numbers of up to 10 million can be expressed in standard, expanded, and word forms.
- The value of each place is 10 times the value of the place to its right and $\frac{1}{10}$ the value of the place to its left.
- Strategies based on place value can be generalized to multiply and divide numbers by tens, hundreds, thousands, and powers of 10.

Standard form: 8,355,647
 Expanded form: $8,000,000 + 300,000 + 50,000 + 5,000 + 600 + 40 + 7$
 Word form: eight million, three hundred fifty-five thousand, six hundred forty-seven

These place-value chips show the value of each digit in a 7-digit number.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	4	5	8	8	1	9

This place-value chart shows the digit in each place.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	7	9	9	0	4	6

After students have built their understanding through concrete and pictorial representations, they will move to the abstract stage where they apply the understanding of place-value concepts to generalize patterns in multiplying and dividing by tens, hundreds, thousands, and powers of ten.

$12 \times 10 = 120$
 $42,000 \div 10 = 4,200$

Chapter 1 Multi-Digit Whole Numbers 18

Chapter Progression

In Section 5A, students use bar models and the four-step problem-solving model to help them solve part-whole and comparison problems involving the four operations of fractions using the unitary method. Students also use bar models to help them understand and solve problems involving finding a fraction of a fraction.

Mr. Reyes has a plot of land that is of 1,728 square meters. He has planted strawberries on $\frac{1}{3}$ of the land, and cherry tomatoes on $\frac{1}{4}$ of the remaining land. Mr. Reyes also wants to grow potatoes. Find the area of the land he can use to plant potatoes.

6 units = 1,728 square m
 1 unit = $1,728 \div 6$
 = 288 square m
 2 units = 2×288
 = 576 square m
 Mr. Reyes can use 576 square meters of the land to plant potatoes.

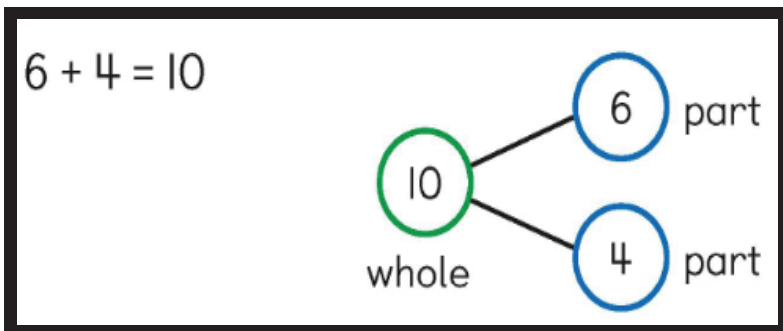
225C Chapter 5 Word Problems: The Four Operations of Fractions © 2022 Marshall Cavendish Education Pte Ltd

CHAPTER PROGRESSION is an overview of what students will learn in each section of the chapter. CPA icons show each stage of the approach and the accompanying math concepts.

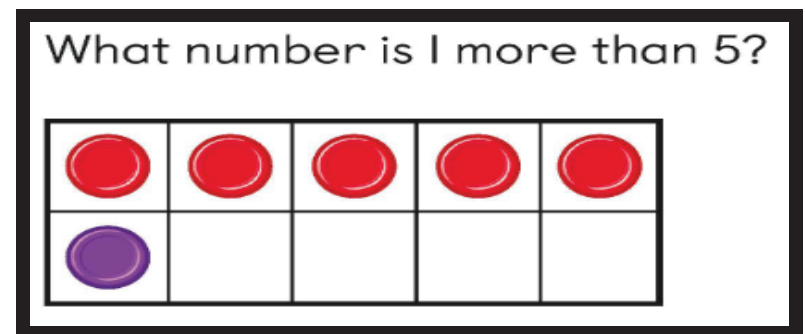
Visualization Through Pictorial Models

Powerful visual models are hallmarks of the Singapore Math[®] approach. These models help students visualize and understand abstract mathematical concepts. Working with the Concrete-Pictorial-Abstract approach, students consistently use these models across grade levels to develop their critical thinking and problem-solving skills.

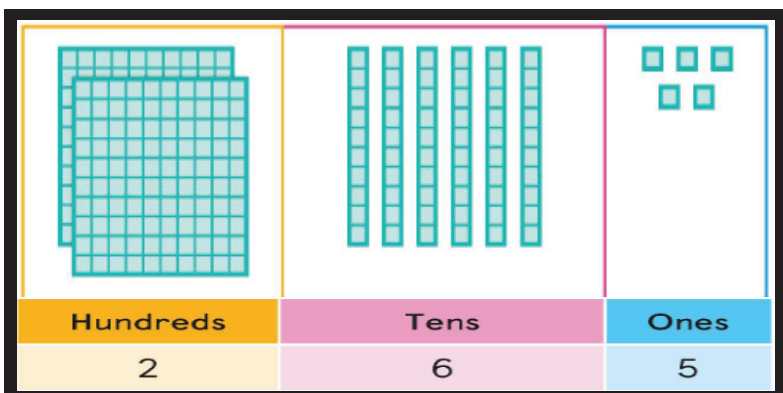
Number Bonds



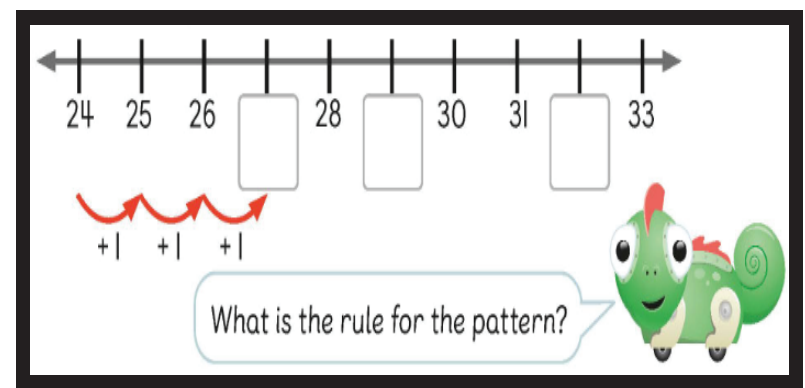
Ten Frames



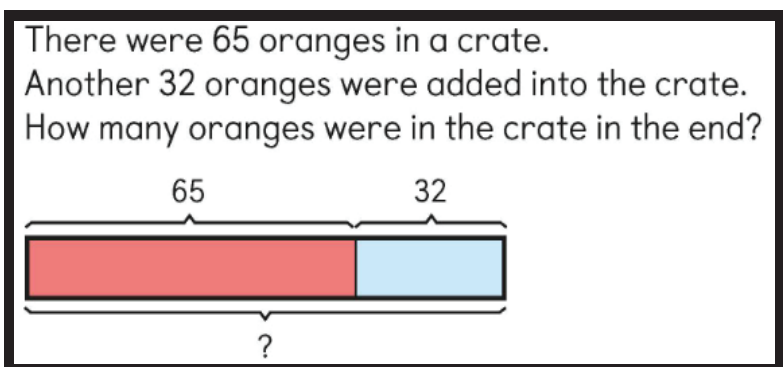
Place Value Charts



Number Lines



Bar Models



Fraction Models

