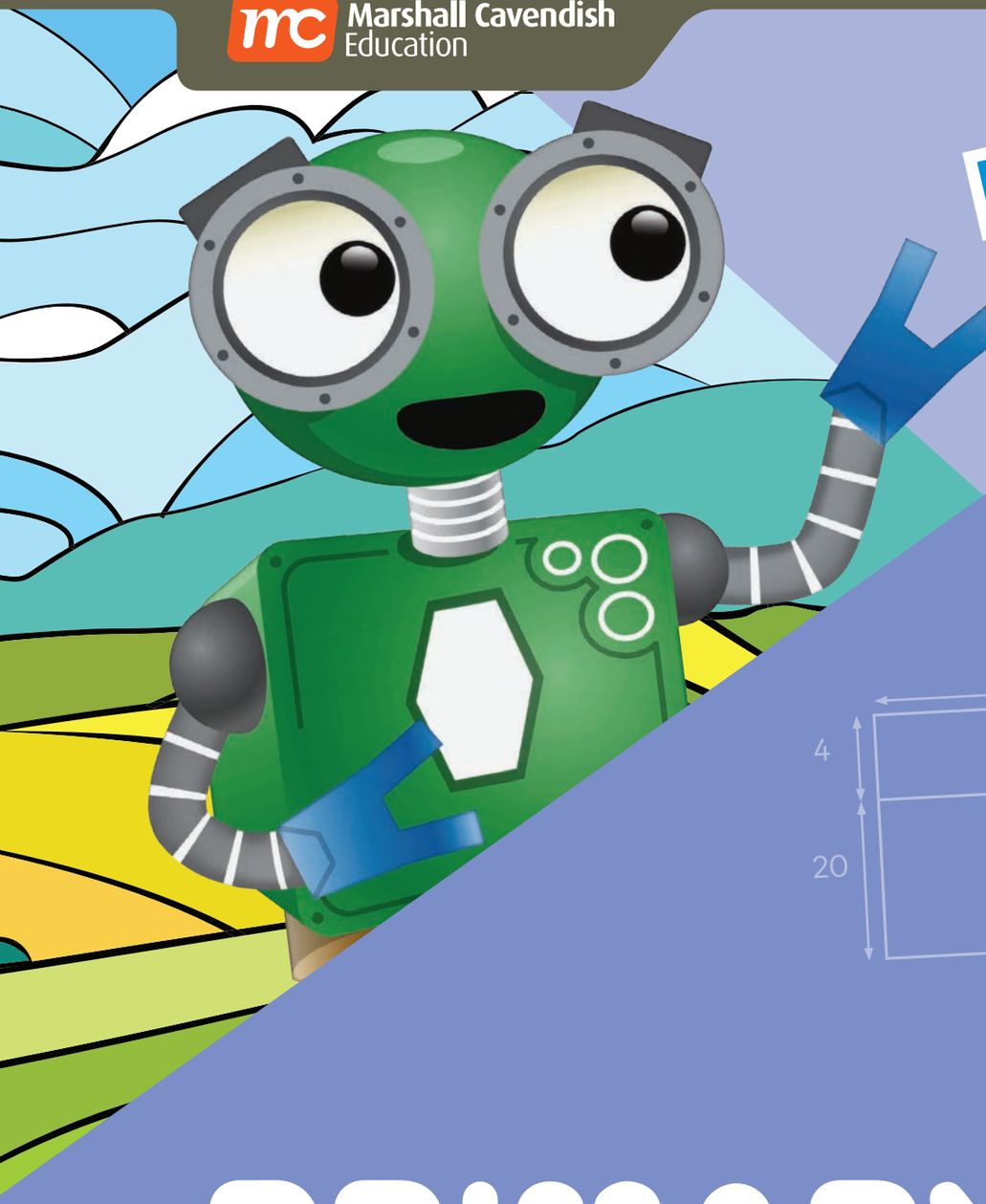
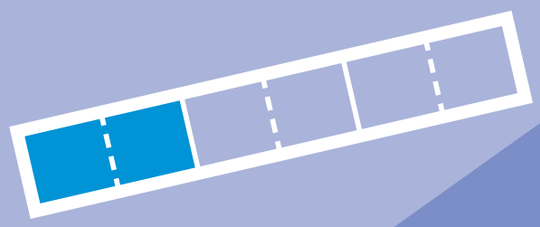
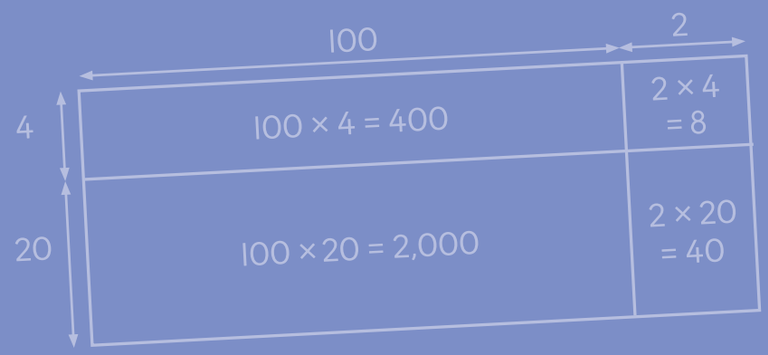
Marshall Cavendish Education





$$1\frac{1}{4} \times 1\frac{2}{3} = \frac{5}{4} \times \frac{5}{3}$$



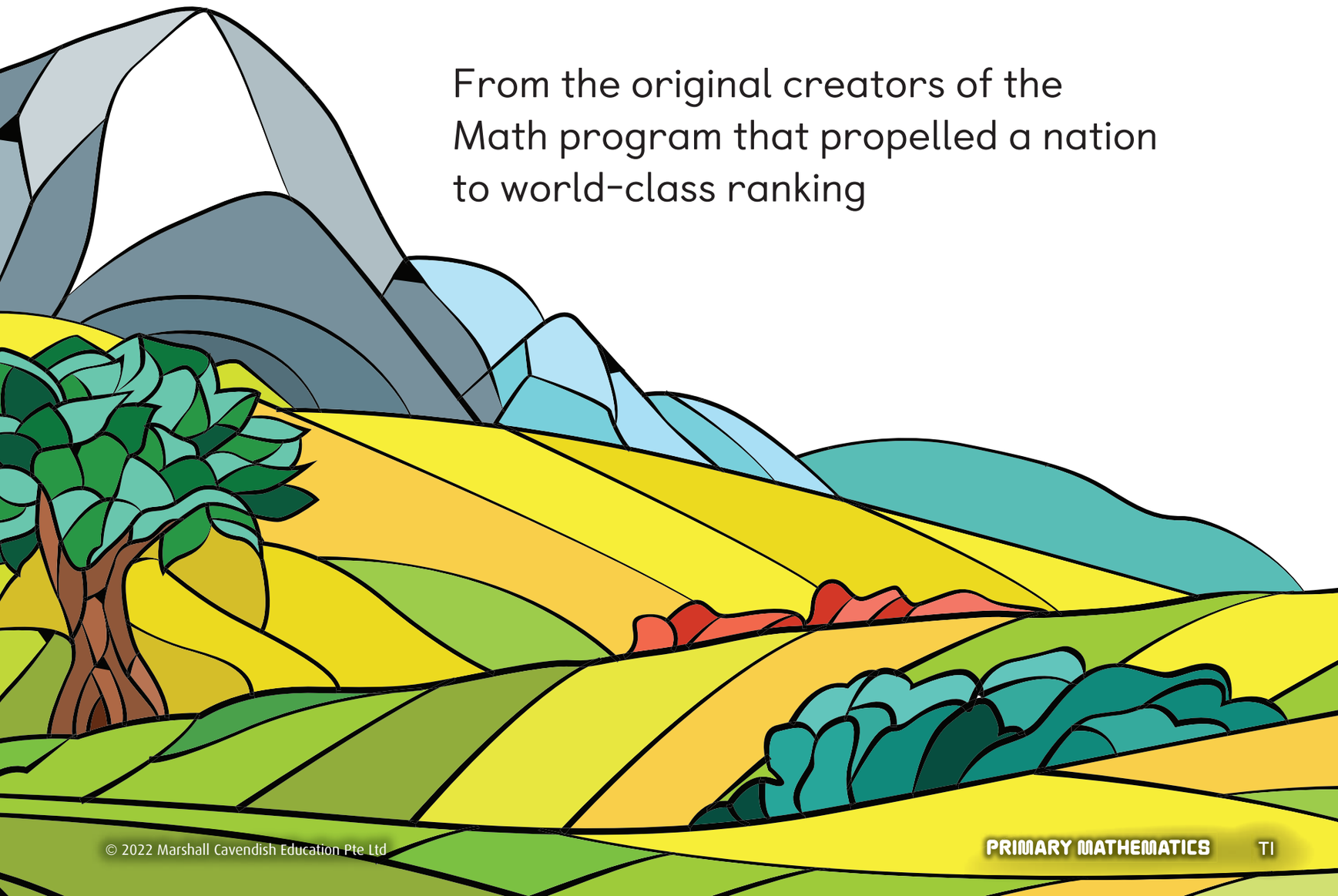
PRIMARY MATHEMATICS

Teacher's Guide

Grade 5A

PRIMARY MATHEMATICS

From the original creators of the Math program that propelled a nation to world-class ranking



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Robust fundamentals strengthened and refined

A program with a respected track record, updated with the latest mathematical thinking and best practices.

PRIMARY MATHEMATICS program – the premier instructional package that launched the Singapore Math® approach

Singapore students have consistently led in international rankings in Math. But four decades ago, this was not the case.

Singapore's past weakness in Math

A survey by the Ministry of Education Singapore in 1975 revealed that primary school students had not mastered basic math skills such as division.

Resolution

Dr. Kho Tek Hong was tasked to solve this problem with a team of nine curriculum specialists. Their challenge: to make an abstract subject easily understandable at a time when English proficiency was quite low.

Their studies and deep research led to the creation of the **Singapore Math®** approach, and the carefully formulated **PRIMARY MATHEMATICS** series. This series played a key role in raising Singapore's math standards.

Completely New and Updated in 2022

The meteoric rise of Singapore students' Math performance caught the attention of U.S. educators.

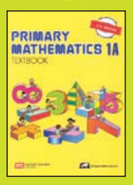
In 1999, the original **PRIMARY MATHEMATICS** program was introduced to schools and homeschools in the U.S., leading to a marked improvement in student performance.

Over the years, the **PRIMARY MATHEMATICS** program has been regularly adapted and updated to fully align with U.S. State Standards. The program has always remained true to the original **Singapore Math®** approach.

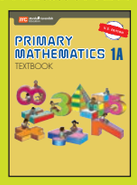
Today, a new, updated **PRIMARY MATHEMATICS** program has been created, completely aligned to U.S. Standards, and incorporating the latest thinking in the teaching and learning of mathematics.

THE PRIMARY MATHEMATICS PROGRAM IN THE U.S. OVER THE YEARS

1999
PRIMARY MATHEMATICS
(3rd Edition)
Singapore edition used in the U.S.



2003
PRIMARY MATHEMATICS
(U.S. Edition) created for U.S. market



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The NEW PRIMARY MATHEMATICS program —

a Grades K to 5 program, providing a robust math learning journey from Kindergarten to elementary school.

Engaging a new generation of teachers and students, the fundamentals of the original **PRIMARY MATHEMATICS** program have been strengthened with the following:

Learning Experiences

Carefully constructed activities give students opportunities to develop mathematical thinking, metacognition, and 21st century competencies such as critical and inventive thinking, collaboration and communication skills.

Growth Mindset

Activities are designed to instill in students a belief that most abilities can be developed through dedication and hard work. This belief encourages students to maintain a positive learning mindset and to persevere in problem solving.

Assessment & Data-driven Reports

Online formative and summative assessment reports help students track their own progress and become self-directed learners. The reports also inform differentiated instruction.

Heuristics

Dedicated problems teach students math problem-solving strategies, developing their ability to think mathematically and extending their problem-solving skills.

Productive Struggle

Students apply prior knowledge and work hard to solve problems slightly above their current level of learning. This productive struggle instill in students perseverance, and develops critical thinking and problem-solving skills.

Digital Resources

Closely integrated print and digital resources enhance the teaching and learning processes. Digital tools help students to visualize and master concepts.

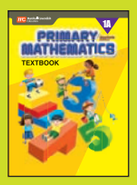
STEAM Project Work

Interdisciplinary projects provide opportunities for collaboration and creative thinking in real-world contexts.

Write-in Student Book

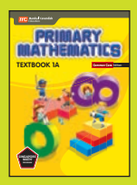
The new **PRIMARY MATHEMATICS** Student Book is now a consumable, write-in book, allowing students to work in the book as they learn.

2007
Aligned to California State Standards. Approved for schools in California by California State Board of Education

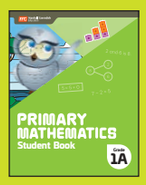


2008
Approved for the Instructional Materials List by Oregon State Board of Education

2013
Aligned to the Common Core State Standards



2022
Completely new and updated edition



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Comprehensive and Integrated Student and Teacher Resources for a Blended Experience

A program packed with learning experiences facilitated by print and digital resources that encourage a growth mindset and confidence in problem solving.

Teaching and Learning

Teachers will plan how to conduct each lesson using the **Teacher's Guides***, **Transition Guide**, and **Interactive Class Presentations**.

Lesson Preparation

Teachers will facilitate discussions using **Interactive Class Presentations** and refer to the **Teacher's Guides** for more strategies to support varied learners.

Teachers will address students' learning gaps with the **Transition Guide** and selected **Key Concept Interactives** for challenging concepts.

READINESS

Students will be engaged in discussions through the **Student Books** or **eBooks** Chapter Opener. They will attempt the questions in Recall* which will help them recall their prior knowledge that serves as a springboard for the new lesson.

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LEGEND

- Print resource
- Student Book feature
- Digital resource
- * Available online

Note: Product offerings may differ from country to country. Refer to the online platform for more details.

Teachers will facilitate the concrete experiences using concrete manipulatives or **digital manipulatives** to help students visualize the math.

ENGAGEMENT

Students will explore in pairs or groups to examine a problem in the **Student Books** or **eBooks** Task, using concrete manipulatives or **digital manipulatives** where applicable. Next, in Learn, students will be introduced to the fundamental aspect of a concept following a Concrete-Pictorial-Abstract approach. Finally, in Learn Together, students will do questions that are carefully varied. With each question, they will gain understanding of a different aspect of the concept.

Teacher may use the **reports** from Practice On Your Own* to monitor students' mastery at a lesson level and kickstart Differentiated Instruction found in the **Teacher's Guides**. Differentiated resources include **Additional Practice***, **Reteach**, and **Extension**.

MASTERY

Students will achieve mastery of the concepts and skills in a chapter through the **Student Books** or **eBooks** Practice On Your Own*, Performance Task, STEAM Project Work, and Chapter Practice. They may play the selected **digital games** to practice what they have learned in a fun manner.
For homework, students will consolidate, deepen, and extend their learning through a variety of practices found in **Additional Practice**, **Mastery and Beyond***, and **Extension**.

Teachers will check and monitor students' performance through the **Assessment Guide Teacher Edition** or **Digital Assessments** and the **reports**.

Assessment

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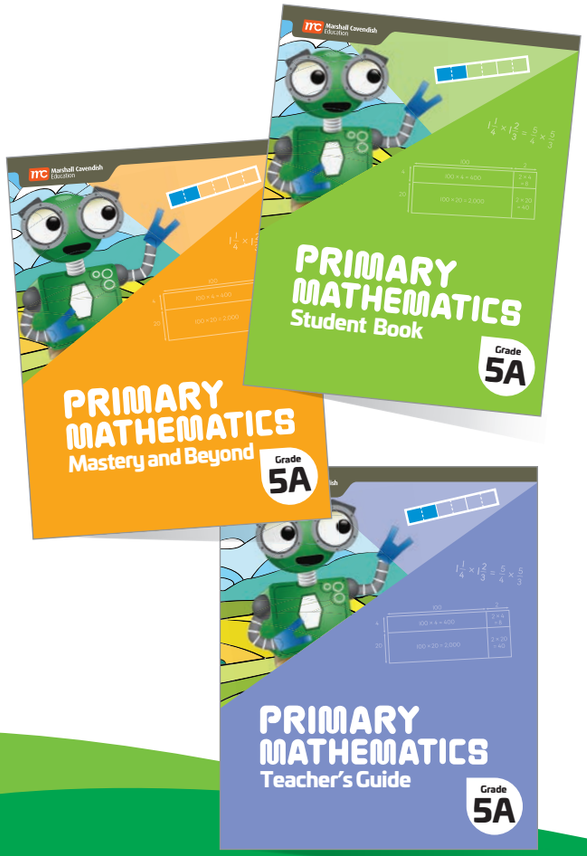
Components

Core Components



As a core component of **PRIMARY MATHEMATICS**, the **Student Book** aims to equip students with strong conceptual understanding, critical thinking, and problem-solving skills. Mathematical concepts are developed in a clear and sequential way to facilitate understanding.

Student Books are also available as **eBooks** for students to access during home-based learning.

The **Teacher's Guide** is designed to accompany the **Student Book**. The guide provides teachers with teaching ideas and arms them with a repertoire of strategies to facilitate exploration, classroom discussions, and student-centric learning. Provided in the **Teacher's Guide** are ideas for differentiation at appropriate junctures in a lesson, including concept development. Differentiated resources are provided to help with small group learning.

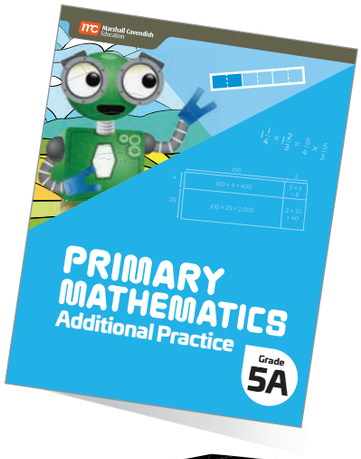
Mastery and Beyond provides consolidated homework across sections in a chapter. Practices in **Mastery and Beyond** guide students to apply essential mathematical concepts in unfamiliar contexts. This provides continued support to sustain learning and foster a strong foundation for future learning. Together, the **Student Book**, **Additional Practice**, and **Mastery and Beyond** are designed to develop fluency and flexibility in math.

Resources For Differentiated Instruction

Reteach exercises are written to help students who need additional support gain required conceptual understanding and skills. Each exercise directly correlates to a lesson in each section of a chapter. Greater scaffolding is provided for each teaching point to guide students to acquire the required knowledge. Parallel questions are provided to give students more opportunities to apply the knowledge learned. Tips to help students are provided in the **Teacher's Guide** at point-of-use.

Additional Practice supplements the **Student Book** and is targeted at providing students with on-level practice of concepts and skills learned in each chapter.

Extension exercises are written to develop creative problem-solving skills in students. Each exercise directly correlates to a lesson in each section of a chapter. The problems in each practice provide additional challenges and hone critical and creative thinking.



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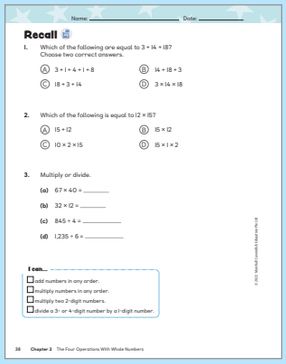
Assessment Opportunities

Assessment is an integral part of the teaching and learning process. The assessment opportunities in **PRIMARY MATHEMATICS** offer a complete picture of students' progress.

In the **Student Book**:

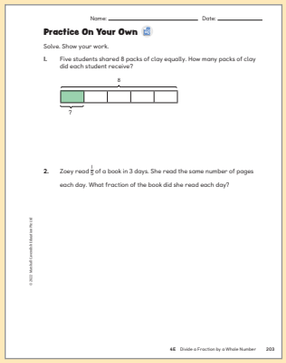
Recall at the start of each chapter assesses students' **readiness** for the chapter. It serves as a diagnostic assessment to measure students' prerequisite knowledge. Students will also self assess their readiness using the "I can" statements.


Recall

1. Which of the following are equal to 3 × 14 + 18? Choose two correct answers.
   (A) 3 × 1 + 4 × 1 + 8 (B) 14 × 18 × 3
   (C) 18 × 3 × 14 (D) 3 × 14 × 18
2. Which of the following is equal to 12 × 15?
   (A) 15 × 12 (B) 15 × 12
   (C) 10 × 2 × 15 (D) 15 × 1 × 2
3. Multiply or divide.
   (a) 67 × 40 = _____
   (b) 32 × 12 = _____
   (c) 845 ÷ 4 = _____
   (d) 1,235 ÷ 6 = _____

I can...
- ☐ add numbers in any order.
- ☐ multiply numbers in any order.
- ☐ multiply two 2-digit numbers.
- ☐ divide a 3- or 4-digit number by a 1-digit number.

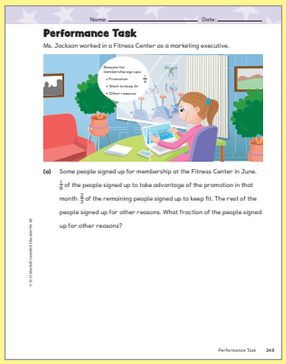
Practice On Your Own at the end of each lesson is a **formative assessment** to inform teachers about the appropriate differentiated resource to assign.


Practice On Your Own

Solve. Show your work.

1. Five students shared 8 packs of clay equally. How many packs of clay did each student receive?
2. Zoey read $\frac{1}{3}$ of a book in 3 days. She read the same number of pages each day. What fraction of the book did she read each day?

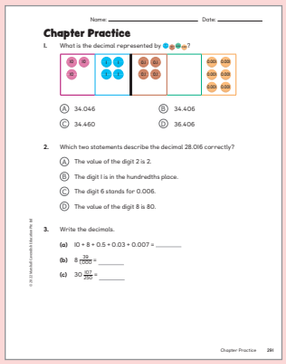
Performance Task is a **formative assessment** task at the end of each chapter. It is set in a real-world context that provides opportunities for students to demonstrate their understanding and proficiency.


Performance Task

Ms. Jackson worked in a Fitness Center as a marketing executive.

(a) Some people signed up for membership at the Fitness Center in June. $\frac{2}{3}$ of the people signed up to take advantage of the promotion in that month. $\frac{3}{5}$ of the remaining people signed up to keep fit. The rest of the people signed up for other reasons. What fraction of the people signed up for other reasons?

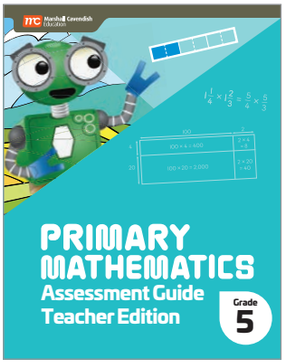
Chapter Practice at the end of each chapter is used to consolidate students' learning. Students apply the concepts and skills learned in the chapter. The questions are leveled using the *Depth of Knowledge* to prepare students for summative assessments.

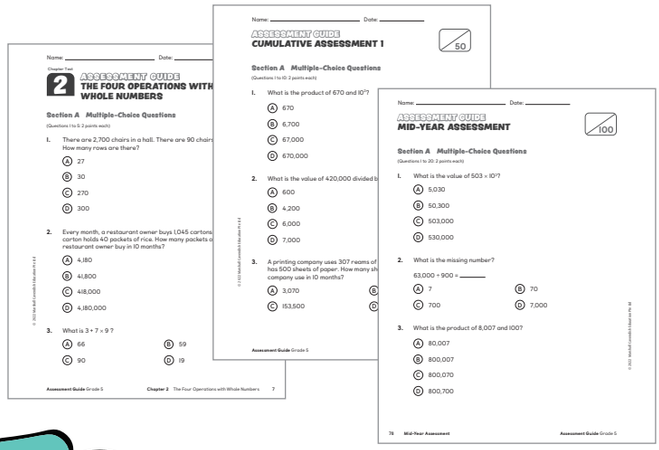

Chapter Practice

1. What is the decimal represented by ?
   (A) 34.046 (B) 34.406
   (C) 34.460 (D) 36.406
2. Which two statements describe the decimal 28.016 correctly?
   (A) The value of the digit 2 is 2.
   (B) The digit 1 is in the hundredths place.
   (C) The digit 6 stands for 0.006.
   (D) The value of the digit 8 is 80.
3. Write the decimals.
   (a) 10 + 8 + 0.5 + 0.03 + 0.007 = _____
   (b) $8\frac{48}{1000}$ = _____
   (c) $30\frac{402}{100}$ = _____

While the assessments in the **Student Book** are formative in nature, assessments that are available digitally and in the corresponding **Assessment Guide Teacher Edition** are **summative**. These assessments serve as a reporting tool for teachers to assess students' learning as well as gather feedback on their teaching.

In the digital assessments and **Assessment Guide Teacher Edition**, Chapter Tests, Cumulative Assessments, Mid-Year and End-of-Year Assessments are provided to assess students' mastery of concepts and skills. Reports for these assessments are provided to give feedback on students' learning.





- **Chapter Test** is administered at the end of each chapter to assess students' mastery of the concepts and skills in the chapter.
- **Cumulative Assessment** occurs at the end of a few chapters to assess students' mastery of the concepts and skills across the chapters.
- **Mid-Year** and **End-of Year Assessments** are given to students to assess their mastery levels and provide feedback on their learning midway and at the end of the year.

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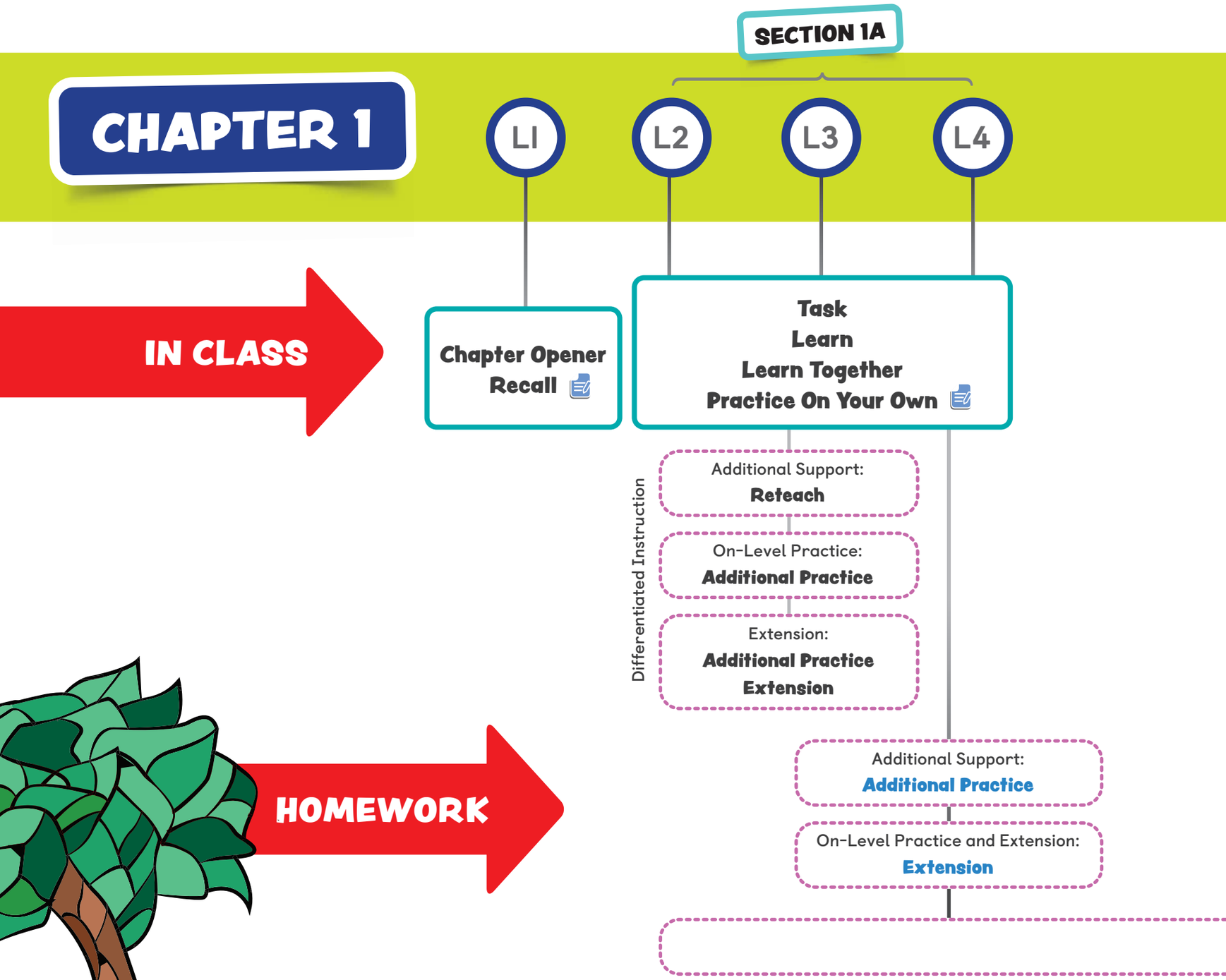
Chapter Pathway

The instructional pathway across a chapter provides an effective learning experience for small-group and whole-class implementations. The different sections and features in each chapter help students build conceptual understanding through a range of practice and fluency-building activities as well as frequent opportunities for classroom discussions, timely differentiated instruction, and problem-solving opportunities.



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LEGEND

- Lesson
- Assessment
- Homework
- Student Book
- Differentiated Instruction
- Digital

SECTION 1B

L5 L6 L7 L8 L9 L10

Task
Learn
Learn Together
Practice On Your Own

Performance Task

STEAM Project Work

Chapter Practice

Assessment:
Chapter Test

Differentiated Instruction

Additional Support:
Reteach

On-Level Practice:
Additional Practice

Extension:
Additional Practice Extension

Additional Support:
Additional Practice

On-Level Practice and Extension:
Extension

Mastery and Beyond

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Strong fundamentals based on proven Singapore Math® approach

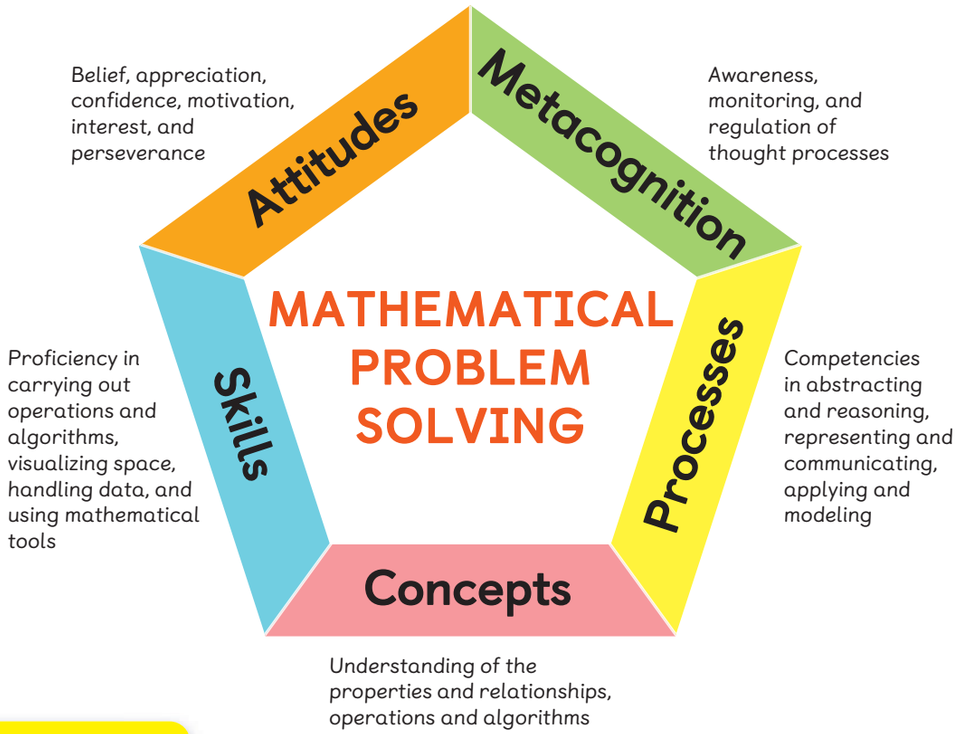
PRIMARY MATHEMATICS is centered on the approach developed and used in Singapore since the early 1980s. This approach is still used in Singapore schools today.

What is the SINGAPORE MATH® APPROACH?

The **Singapore Math®** approach emphasizes developing conceptual understanding, mathematical skills and processes, metacognition, and right attitudes. At the heart of this approach is mathematical problem solving.

Enabling Problem Solving

This is done with a consistent problem-solving process and the use of heuristics. Students are encouraged to persevere to discover mathematical results for varied situations and contexts.



Referred from Singapore Ministry of Education Math Curriculum

SINGAPORE STUDENTS CONSISTENTLY RANK TOP IN INTERNATIONAL BENCHMARK ASSESSMENTS

Singapore's consistently outstanding achievements in international Mathematical benchmark assessments such as **TIMSS** and **PISA** are well-documented.

Because of its proven effectiveness, the Singapore Math® approach has been adapted successfully in over 50 countries.

All data is taken directly from TIMSS reports, 2019 and PISA reports, 2018.

TIMSS 2019* Grade 4	
Singapore	625
United States	535
TIMSS Scale Centerpoint	500

PISA Mathematics Scale 2018**	
Singapore	569
OECD average	491
United States	470

*https://timss2019.org/reports/achievement/

**https://www.oecd.org/pisa/Combined_Executive_Summaries_PISA_2018.pdf

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Key characteristics of the SINGAPORE MATH® APPROACH

CONCRETE-PICTORIAL-ABSTRACT	Students engage with mathematical concepts by first handling **physical objects**, then representing mathematical ideas using **diagrams**, and finally using **abstract representations**. Through the use of concrete materials and visual representations, students are able to "see" and make sense of the math and the abstract representations.
VISUAL MODELS	Visual models such as number bonds, bar models, and fraction models are hallmarks of the **Singapore Math®** approach. These models help students visualize and understand abstract mathematical concepts.
PROBLEM SOLVING	**Heuristics** are introduced at each grade level to equip students with strategies to solve increasingly complex problems. Students apply these heuristics to solve real-world problems through a **consistent problem-solving process**.
MATHEMATICAL & PERCEPTUAL VARIATIONS	**Mathematical variation** presents opportunities for students to experience the same mathematical concept through various applications. **Perceptual variation** showcases a mathematical concept using different representations. Variation deepens understanding as students apply mathematical concepts in different ways.
LEARNING PROGRESSION	Math is learned **incrementally**, with one concept building on the next. More depth is added, linking new concepts to the learning that has already taken place. Learning math this way leads to **deeper conceptual understanding**.
DIFFERENTIATION & ASSESSMENT	Students' learning is supported through **differentiated activities** and **practices**. Students receive timely feedback on their learning through **formative** and **summative assessments**.

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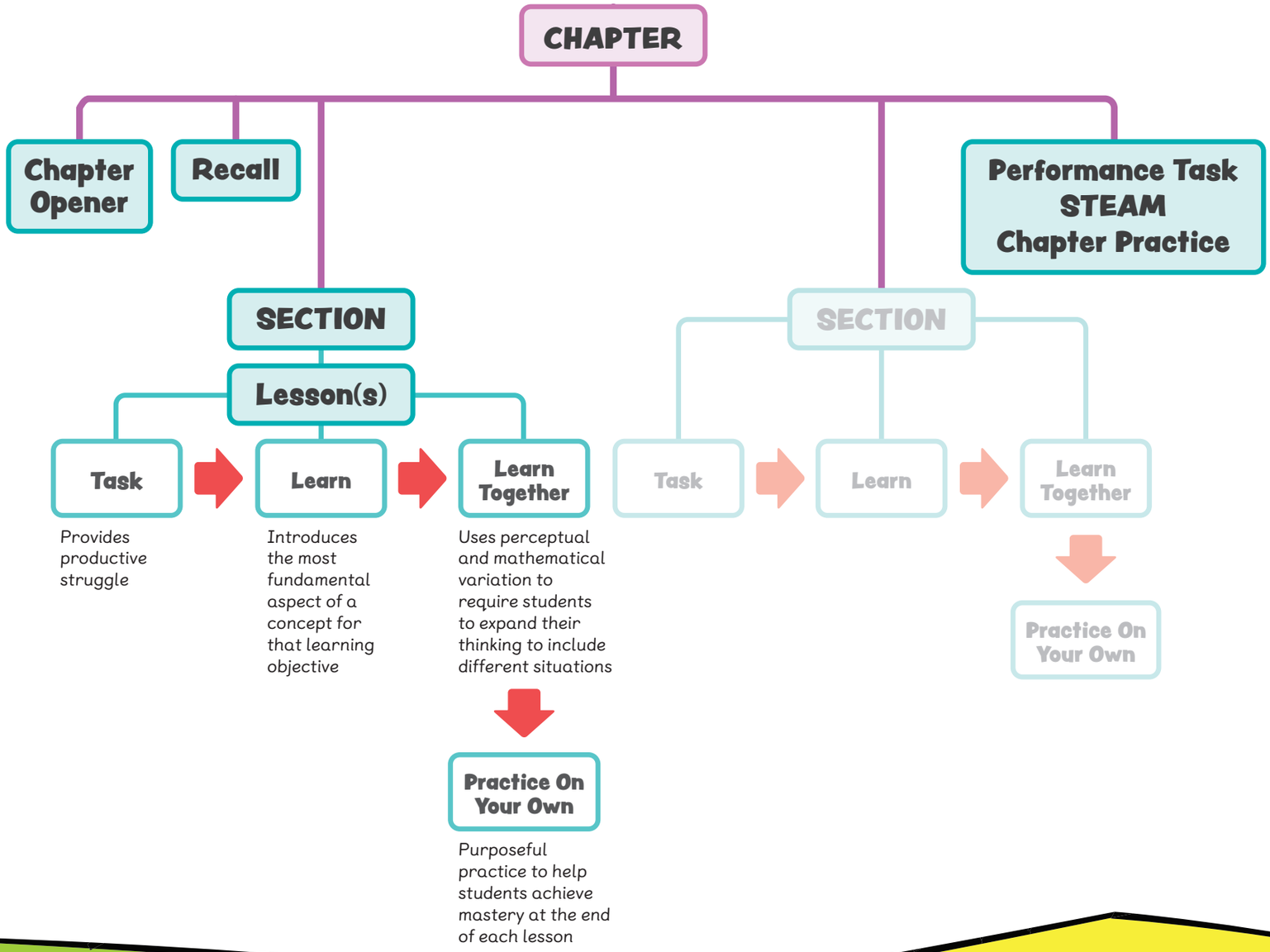
Rich learning delivered effectively and simply

Progression to MASTERY

In every lesson, mathematical concepts are presented from the simplest and most basic aspect to the most complex aspect for that grade. This is done to build a strong foundation that ensures successful progression to mastery.

With simple language and captivating visuals that support learning, all students can achieve mastery.

Students construct knowledge and build skills through a deliberate set of tasks/questions. Each is carefully designed to expose students to a different aspect of a concept. This process of learning helps students make new connections and progress to the next level of understanding.



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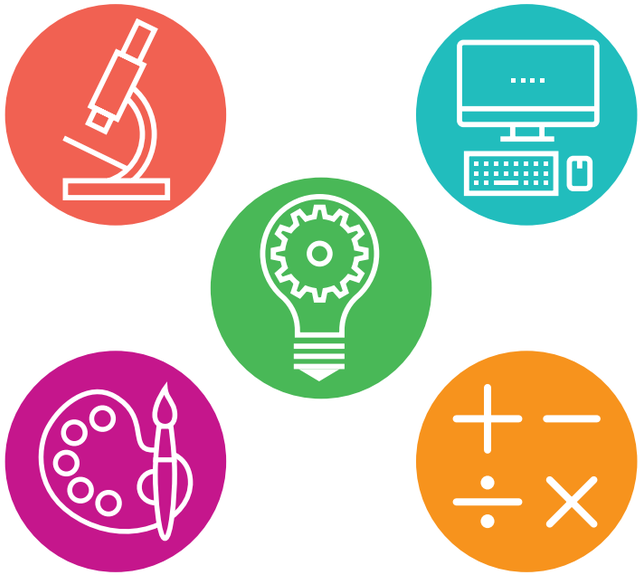
CULTIVATING
Mathematical Practices

The successful learning of mathematics involves applying the following mathematical practices. These mathematical practices are built into the activities, explorations, practices, and discussions.

MP.1 PERSEVERE
MP.2 REASON
MP.3 CONSTRUCT VIABLE ARGUMENTS
MP.4 MODEL
MP.5 USE TOOLS
MP.6 USE MATH LANGUAGE
MP.7 USE STRUCTURE
MP.8 LOOK FOR PATTERNS

CONSOLIDATING
Through "STEAM" Project Work

The ability to synthesize and apply knowledge across disciplines develops important, transferable skills, and engages students' varied interests. Project work combines **S**cience, **T**echnology, **E**ngineering, and the **A**rts with **M**athematics in realistic and relatable contexts. This gives students opportunities to collaborate, and to think creatively and critically.



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Structured for effective instruction

PRIMARY MATHEMATICS is based on the Readiness-Engagement-Mastery instructional design.

Phases of LEARNING

Readiness–Engagement–Mastery is the instructional model advocated for in the Singapore mathematics curriculum.

READINESS

In this phase, teachers engage students, capturing their attention through interesting and relatable scenarios. Teachers ascertain readiness to learn by helping students make connections to previously-learned concepts and skills.

ENGAGEMENT

Students learn by doing, and are challenged to construct new knowledge through engaging activities and guided inquiry.

MASTERY

Students gain fluency and confidence through leveled practice. They gain mastery through review and reflection in oral and written forms. They also tackle problems in unique and effective ways.

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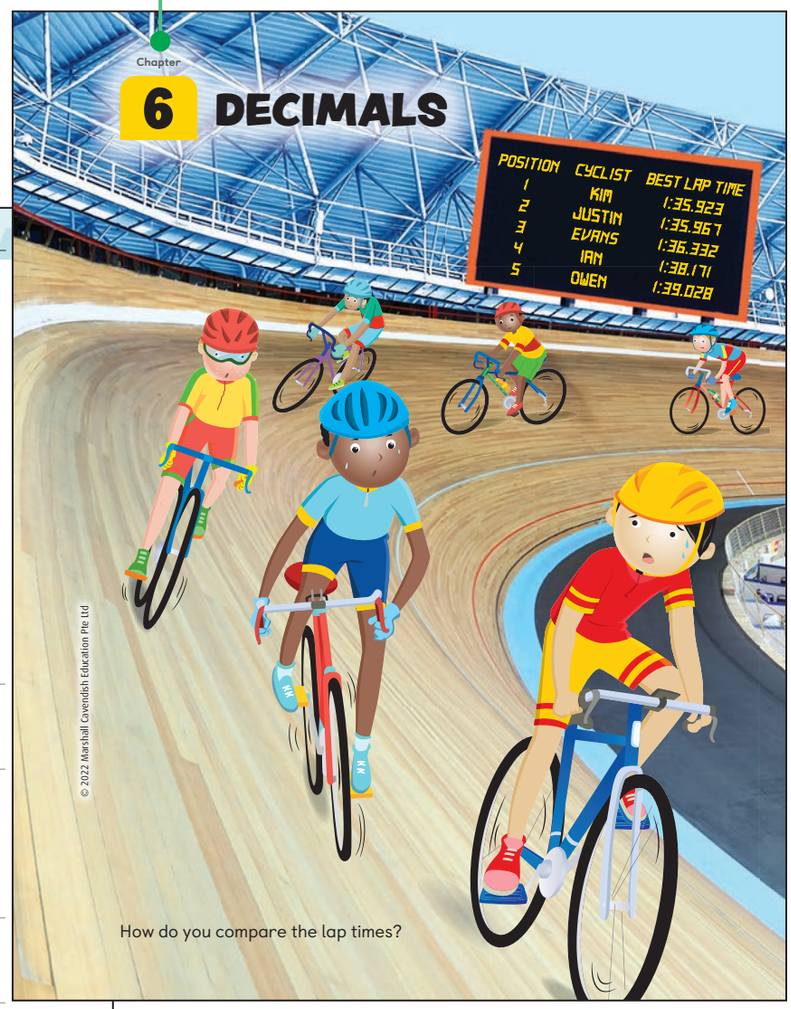
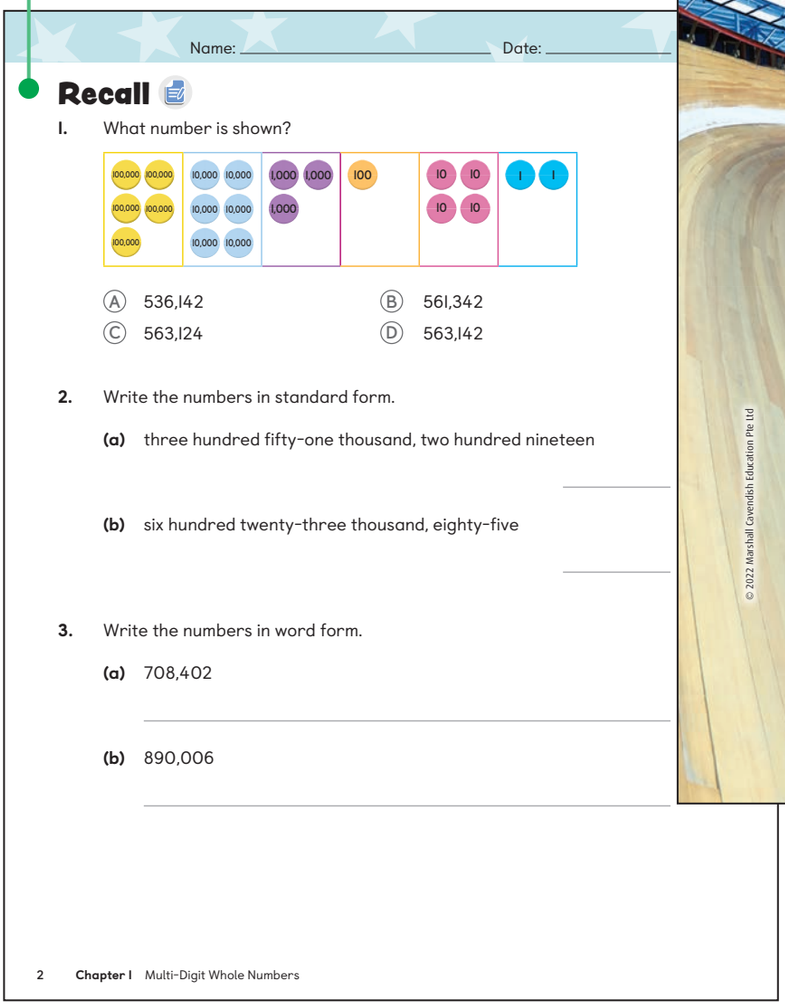
For the "**Readiness**" phase of learning, students engage in learning through:

- **Student Book**
  - **Chapter Opener**
  - **Recall**
- **Transition Guide**

CHAPTER OPENER stimulates curiosity and interest through a context that connects Math to real life, taps into prior knowledge, and encourages discussion.

RECALL assesses students' readiness for the chapter so that teachers can allocate appropriate resources during lessons. This is also available online in auto-graded format, with data-driven reports that illustrate students performance levels.





Name: _____ Date: _____

Recall

1. What number is shown?

(A) 536,142 (B) 561,342
(C) 563,124 (D) 563,142

2. Write the numbers in standard form.

(a) three hundred fifty-one thousand, two hundred nineteen

_____

(b) six hundred twenty-three thousand, eighty-five

_____

3. Write the numbers in word form.

(a) 708,402

_____

(b) 890,006

_____

2 **Chapter 1** Multi-Digit Whole Numbers

TRANSITION GUIDE is a detailed guide for teachers to transition students into the Singapore math® program. The guide provides teachers with essential background information on important concepts and highlights potential challenges that students might face. It also helps teachers understand the strategies and methodology used in Singapore math®.

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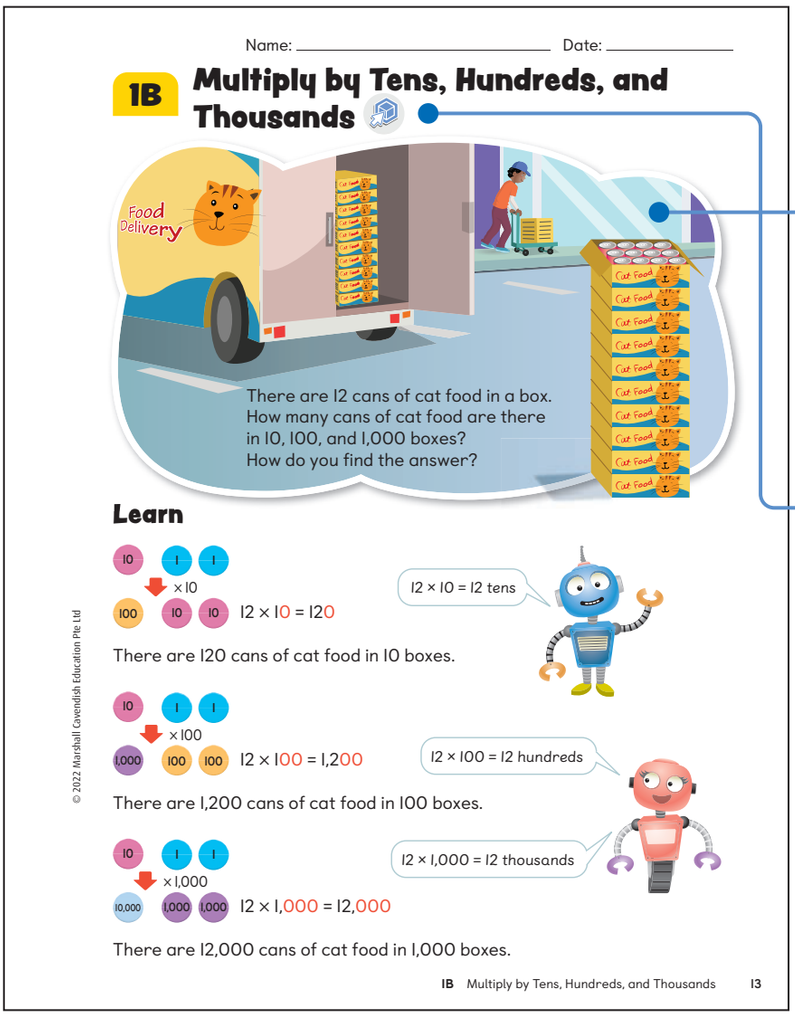
For the "**Engagement**" phase of learning, students engage in learning through:

- **Student Book**
  - **Task**
  - **Learn**
  - **Learn Together**
  - **Activity!**



Name: _____ Date: _____

1B Multiply by Tens, Hundreds, and Thousands

There are 12 cans of cat food in a box.
How many cans of cat food are there in 10, 100, and 1,000 boxes?
How do you find the answer?

Learn

10 1 1 ×10 100 10 10 12 × 10 = 120

There are 120 cans of cat food in 10 boxes.

12 × 10 = 12 tens

10 1 1 ×100 1,000 100 100 12 × 100 = 1,200

There are 1,200 cans of cat food in 100 boxes.

12 × 100 = 12 hundreds

10 1 1 ×1,000 10,000 1,000 1,000 12 × 1,000 = 12,000

There are 12,000 cans of cat food in 1,000 boxes.

12 × 1,000 = 12 thousands

1B Multiply by Tens, Hundreds, and Thousands 13

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TASKS are relatable questions just beyond students' current level of formal learning. They provide opportunities for productive struggle.

LEARN is a teacher-guided inquiry related to the Task. It introduces the most fundamental aspect of a concept for that learning objective. Students learn through concrete experiences and visual models.

DIGITAL MANIPULATIVES are interactive tools that support teaching and learning.

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ACTIVITY! requires students to solve problems collaboratively and to demonstrate understanding by articulating their thinking.

Activity!

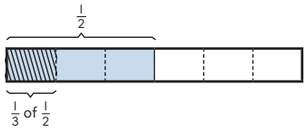
MODEL Fold and color a rectangular piece of paper to show $\frac{3}{4}$ of $\frac{1}{2}$.
Draw and show your work.

What do you notice about the product of $\frac{1}{2}$ and $\frac{3}{4}$ and the product of $\frac{3}{4}$ and $\frac{1}{2}$?

LEARN TOGETHER consists of a series of problems that are carefully varied and progress from the simplest concept in **LEARN** to more complex ones, developing and deepening students' understanding. **LEARN TOGETHER** is student-centric. The variation exposes students to the different ways a concept can be tested. This helps them to develop application of concepts in different perspectives.

Learn Together

1. The model shows $\frac{1}{3}$ of $\frac{1}{2}$.



$\frac{1}{3}$ of $\frac{1}{2} = \frac{1}{3} \times \frac{1}{2}$

$= \frac{\times}{\times}$

$=$ _____

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For the "**Mastery**" phase of learning, students gain mastery through these resources:

- **Student Book**
  - **Practice On Your Own**
  - **Think!**
  - **Chapter Practice**
  - **Performance Task**
  - **STEAM Project Work**
  - **Heuristics**
- **Reteach**
- **Additional Practice**
- **Extension**
- **Mastery and Beyond**

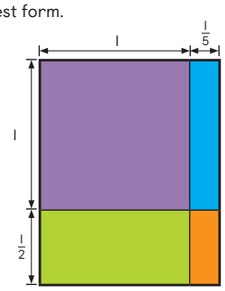
PRACTICE ON YOUR OWN is an independent practice at the end of a lesson. It serves as a formative assessment, informing teachers which differentiated resources they should assign to their students. This is also available online in auto-graded format, with data-driven reports that illustrate students' performance levels.

THINK! leads students to reflect on mathematical concepts and challenges them to use different strategies to solve a novel problem.

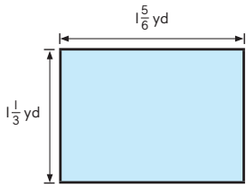
Practice On Your Own

1. Multiply. Express your answers in simplest form.

(a) $1\frac{1}{5} \times 1\frac{1}{2}$



(b) $1\frac{5}{6} \times 1\frac{1}{3}$



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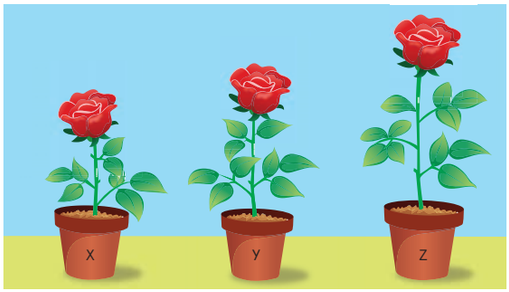
Think!

4. REASON Brooke, Isaac, and Hannah compared the heights of the rose plants they grew for a Science experiment. Brooke's rose plant was 6 inches tall. Isaac's rose plant was $\frac{5}{6}$ the height of Brooke's rose plant. Hannah's rose plant was $\frac{4}{3}$ the height of Brooke's rose plant. Without multiplying, identify which rose plant belongs to which student. Explain your thinking.



Pot X: _____

Pot Y: _____

Pot Z: _____

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PERFORMANCE TASKS are formative assessment tasks, set in real-world contexts, with accompanying rubrics. The questions require application of concepts and skills learned or they may be open-ended but with limited possible answers.

STEAM PROJECT WORK is an interdisciplinary task that spans multiple chapters and shows the relevance and importance of mathematics. It promotes critical and creative thinking.

Name: _____ Date: _____

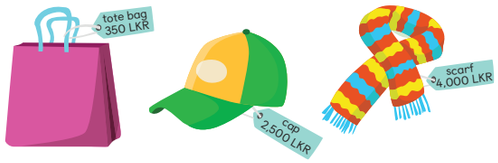
Performance Task

Camila is planning a trip to Sweden, Sri Lanka, and Columbia. She exchanges some foreign currencies using the exchange rates shown.

Exchange 1 U.S. Dollar (USD) for		
Sweden Krona	SEK	10
Sri Lankan Rupee	LKR	200
Columbian Peso	COP	3,000

1. How much of each currency will Camila receive if she exchanges 390 USD each time? Show your work.

2. REASON AND MODEL Camila bought some souvenirs when she was in Sri Lanka. She spent a total of 36 USD on four souvenirs.



Using a table, make a list of the four souvenirs that have bought.

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Project Work

Perfect Slime Recipe

Do you know that slime is neither liquid nor solid? What makes slime sticky and stretchy so that you can pull and play with it? One of the ingredients used in making slime is glue. What other ingredients do you think you would need to make slime?

Task

1. Use the internet to learn about the science behind making slime and find some homemade slime recipes.
2. Create your own slime recipe using fractions and mixed numbers.
3. Make the slime using your recipe. You may need to experiment with the amount of ingredients and/or the type of ingredients to perfect your recipe.
4. Write the instructions by including addition, subtraction, multiplication, and division of fractions and mixed numbers.
5. Compare your slime with your classmates. How does the slime flow differently?
6. Share your recipe with your classmates and have them convert the fractions and mixed numbers to decimals.

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Name: _____ Date: _____

Chapter Practice

1. Fill in the blank.
6,000,000 + 50,000 + 300 + 4 = _____

(A) 6,050,304 (B) 6,050,340
(C) 6,053,004 (D) 6,534,000

2. The value of the digit 4 in the number 5,243,876 is 10 times the value of the digit 4 in which of the following number?

(A) 5,295,142 (B) 6,428,697
(C) 7,314,950 (D) 8,982,431

3. Write 3,845,712 in word form.

_____

_____

4. Fill in the blanks.

(a) _____ × 1,000 = 3,079,000

(b) 248 × 10^2 = _____

(c) 5,204 × _____ = 5,204,000

(d) 20 × 9,000 = 18 × _____

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CHAPTER PRACTICE consolidates concepts and skills across a chapter through leveled and independent practice. This is also available online in auto-graded format, with data-driven reports that illustrate students' performance levels.

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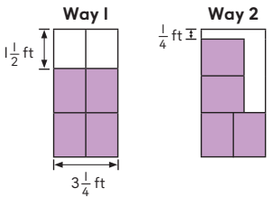
Name: _____ Date: _____

Solve! Heuristics: Write an Equation

Four identical rectangular posters are pasted on a wall. The width of the wall is $3\frac{1}{4}$ feet. The posters are arranged in two ways each leaving a gap. What is the height of the wall?



Step 1 **Understand**

What measurements are given?
What do I have to find?

Step 2 **Plan**

I can **write an equation** to find the height (H) and the width (W) of a poster.

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Solve! Heuristics

SOLVE! HEURISTICS is a dedicated section to teach problem-solving strategies that can be applied to different types of problems. Across the grades, students will be introduced to new strategies that will help them tackle complex problems.

Name: _____ Date: _____

Chapter 1

MULTI-DIGIT WHOLE NUMBERS

Practice 1

1.

Hundred Millions	Ten millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
		2	4	0	8	5	6	7

The place-value chart shows a 7-digit number.

(a) Write the number in standard form.

(b) Write the number in expanded form.

(c) Write the number in word form.

(d) The digit 4 is in the _____ place.

Its value is _____.

(e) The digit _____ is in the millions place.

Its value is _____.

(f) The number is _____ when rounded to the nearest thousand.

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MASTERY AND BEYOND consolidates concepts and skills at a section level of a chapter to deepen and strengthen students' understanding. This component can be assigned at a section level.

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Name: _____ Date: _____

Chapter 2

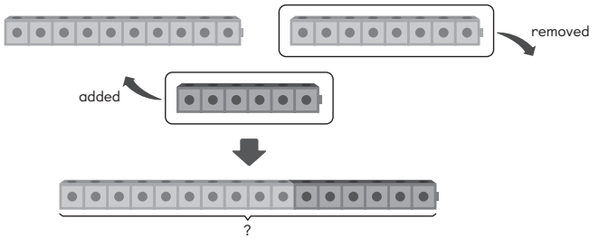
RETEACH

THE FOUR OPERATIONS WITH WHOLE NUMBERS

Exercise 2A Order of Operations (1)

Example 1

There were 18 eggs on a tray.
8 of them were used to make some omelettes.
6 more eggs were added to the tray.
How many eggs were there on the tray in the end?



18 − 8 + 6

= 10 + 6

= 16

There were 16 eggs on the tray in the end.

Carry out addition and subtraction from left to right.

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RETEACH consists of worked examples and scaffolded, leveled questions for students who need more support in reaching mastery.

ADDITIONAL PRACTICE provides on-level practice at the end of each lesson. This component enables students to hone their skills and sharpen their grasp of concepts.

Name: _____ Date: _____

Chapter 4

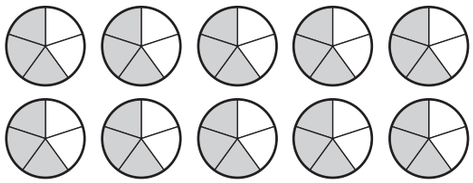
ADDITIONAL PRACTICE

MULTIPLICATION AND DIVISION OF FRACTIONS

Exercise 4A Product of Fractions and Whole Numbers (1)

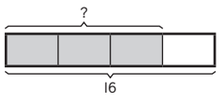
1. Multiply.

(a)



$10 \times \frac{3}{5}$

(b)



$\frac{3}{4} \times 16$

2. Multiply. Express the products in simplest form.

(a) $27 \times \frac{5}{6}$ **(b)** $30 \times \frac{3}{8}$

(c) $20 \times \frac{8}{3}$ **(d)** $24 \times \frac{7}{5}$

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EXTENSION consists of novel and higher-order thinking problems to motivate students with challenging practice.

Name: _____ Date: _____

Chapter 5

EXTENSION

WORD PROBLEMS: THE FOUR OPERATIONS OF FRACTIONS

Exercise 5A Word Problems (1)

1. Michelle spent $\frac{3}{4}$ hour practicing the piano on Monday. She spent $\frac{1}{6}$ hour longer practicing the piano on Monday than on Tuesday.

On Wednesday, she spent twice as much time practicing the piano than on Tuesday. How much time did Michelle spend practicing the piano altogether? Express your answer as a mixed number in simplest form.

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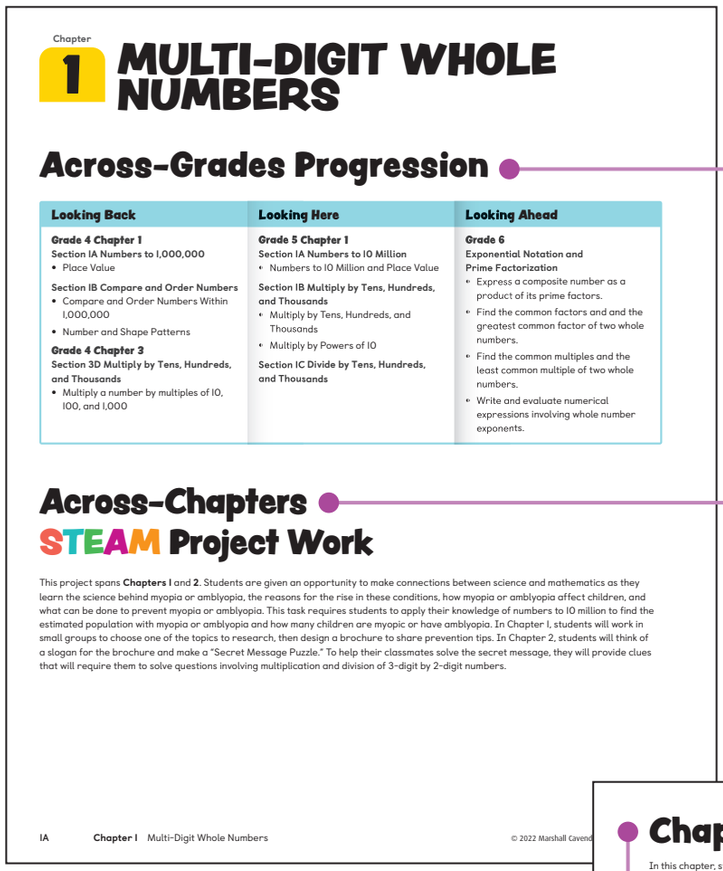
About this Teacher's Guide

Quality resources, ideas, and strategies make your planning seamless and your lessons coherent.



Chapter 1

MULTI-DIGIT WHOLE NUMBERS

Across-Grades Progression

Looking Back	Looking Here	Looking Ahead
Grade 4 Chapter 1 **Section 1A Numbers to 1,000,000** • Place Value **Section 1B Compare and Order Numbers** • Compare and Order Numbers Within 1,000,000 • Number and Shape Patterns **Grade 4 Chapter 3** **Section 3D Multiply by Tens, Hundreds, and Thousands** • Multiply a number by multiples of 10, 100, and 1,000	**Grade 5 Chapter 1** **Section 1A Numbers to 10 Million** • Numbers to 10 Million and Place Value **Section 1B Multiply by Tens, Hundreds, and Thousands** • Multiply by Tens, Hundreds, and Thousands • Multiply by Powers of 10 **Section 1C Divide by Tens, Hundreds, and Thousands**	**Grade 6** **Exponential Notation and Prime Factorization** • Express a composite number as a product of its prime factors. • Find the common factors and and the greatest common factor of two whole numbers. • Find the common multiples and the least common multiple of two whole numbers. • Write and evaluate numerical expressions involving whole number exponents.

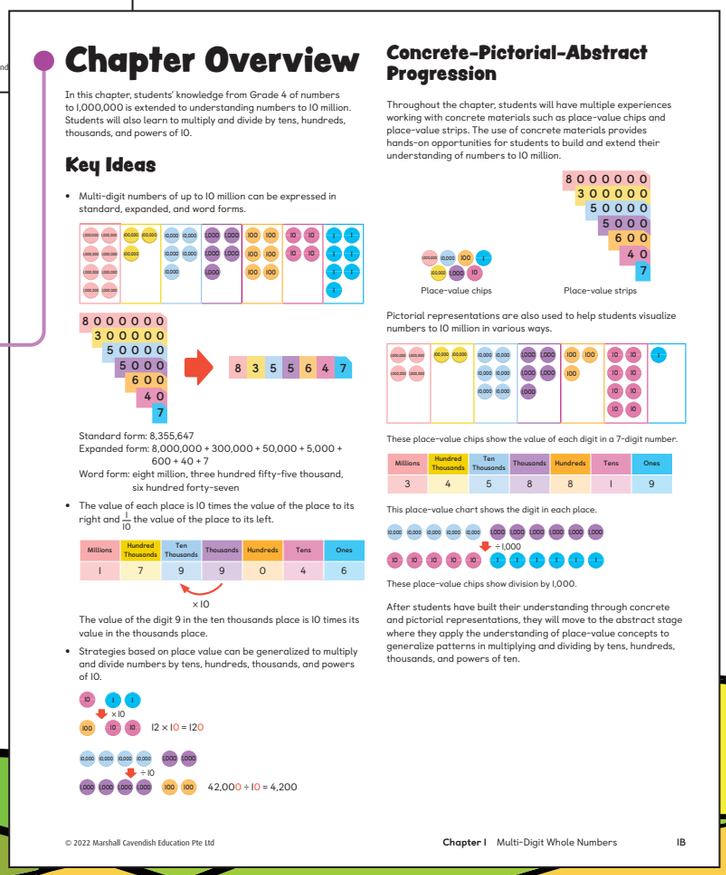
Across-Chapters STEAM Project Work

This project spans **Chapters 1** and **2**. Students are given an opportunity to make connections between science and mathematics as they learn the science behind myopia or amblyopia, the reasons for the rise in these conditions, how myopia or amblyopia affect children, and what can be done to prevent myopia or amblyopia. This task requires students to apply their knowledge of numbers to 10 million to find the estimated population with myopia or amblyopia and how many children are myopic or have amblyopia. In Chapter 1, students will work in small groups to choose one of the topics to research, then design a brochure to share prevention tips. In Chapter 2, students will think of a slogan for the brochure and make a "Secret Message Puzzle." To help their classmates solve the secret message, they will provide clues that will require them to solve questions involving multiplication and division of 3-digit by 2-digit numbers.

1A Chapter 1 Multi-Digit Whole Numbers © 2022 Marshall Cavend

ACROSS-GRADES PROGRESSION shows a longitudinal progression providing an overview of prior knowledge in Looking Back, current grade learning objectives in Looking Here, and future learning in Looking Ahead.

ACROSS-CHAPTERS STEAM PROJECT WORK provides a brief background of the project work and how it relates to Math and other disciplines. The write-up also explains how the skills involved are related to the chapters the project work spans, and breaks down the tasks to be distributed over the chapters.



Chapter Overview

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.

Key Ideas

- Multi-digit numbers of up to 10 million can be expressed in standard, expanded, and word forms.

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

- 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.

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

× 10

The value of the digit 9 in the ten thousands place is 10 times its value in the thousands place.

- Strategies based on place value can be generalized to multiply and divide numbers by tens, hundreds, thousands, and powers of 10.

× 10
12 × 10 = 120

÷ 10
42,000 ÷ 10 = 4,200

Concrete-Pictorial-Abstract Progression

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.

Place-value chips Place-value strips

Pictorial representations are also used to help students visualize numbers to 10 million in various ways.

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.

÷ 1,000

These place-value chips show division by 1,000.

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.

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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 concrete materials used, pictorial and abstract representations students will encounter in the chapter.

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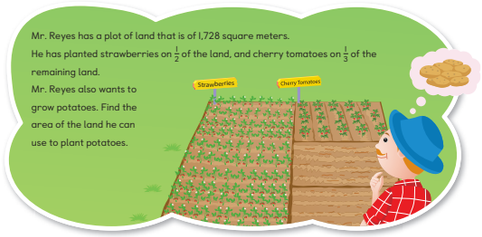
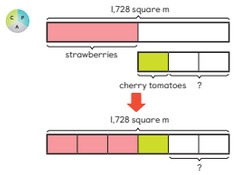
Chapter Progression

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.





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

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CHAPTER PROGRESSION is an overview of what students will learn in each section of the chapter.

Chapter at a Glance

Total Number of Lessons: 11*	Lesson 1 Chapter Opener / Recall Pages 225–228	5A Word Problems		
		Lesson 2 Solve Part-Whole and Comparison Problems Pages 229–234	Lesson 3 Solve Problems Using the Unitary Method Pages 235–242	Lesson 4 Solve Problems Involving Finding Fraction of a Fraction Pages 243–248
Learning Outcome(s)		• Solve real-world problems involving the four operations of fractions.	• Solve real-world problems involving the four operations of fractions using the unitary method.	• Solve real-world problems involving finding a fraction of a fraction.
Focus Question		• How do bar models help you solve real-world problems involving fractions?	• How do bar models help you solve real-world problems involving fractions using the unitary method?	• How do bar models help you solve real-world problems involving finding a fraction of a fraction?
I CAN Statement(s)		• I can draw bar models to understand real-world problems involving fractions. • I can solve real-world problems involving the four operations of fractions.	• I can draw bar models to understand real-world problems involving fractions. • I can solve real-world problems involving the four operations of fractions using the unitary method.	• I can draw bar models to understand real-world problems involving finding a fraction of a fraction. • I can solve real-world problems involving finding a fraction of a fraction.
Vocabulary				
Material(s)	• 1 set of fraction circles or tiles per pair or small group • 2 copies of Bar Model Strips (TR05) per student	• 1 piece of string ($\frac{3}{4}$ foot long) for teacher • 2 copies of Bar Model Strips (TR05) per student	• 2 copies of Bar Model Strips (TR05) per student	• 2 copies of Bar Model Strips (TR05) per student
Instructional Resource(s)	• **Student Book**, pp. 225–228	• **Student Book**, pp. 229–234 • **Additional Practice 5A**, Exercise 5A (1) • **Reteach 5**, Exercise 5A (1) • **Extension 5**, Exercise 5A (1)	• **Student Book**, pp. 235–242 • **Additional Practice 5A**, Exercise 5A (2) • **Reteach 5**, Exercise 5A (2) • **Extension 5**, Exercise 5A (2)	• **Student Book**, pp. 243–248 • **Additional Practice 5A**, Exercise 5A (3) • **Reteach 5**, Exercise 5A (3) • **Extension 5**, Exercise 5A (3) • **Mastery and Beyond 5A**, Chapter 5, Practice 1
Mathematical Practice(s)	• 4 Model • 5 Use Tools	• 1 Persevere • 2 Reason • 4 Model • 5 Use Tools	• 1 Persevere • 2 Reason • 4 Model • 5 Use Tools • 6 Use Math Language	• 1 Persevere • 2 Reason • 4 Model • 5 Use Tools

*Each lesson spans a day and is planned around 50 to 60 minutes.

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CHAPTER AT A GLANCE shows the lesson objectives, focus questions, I CAN statements, new vocabulary, materials, and instructional resources necessary to prepare for teaching.

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CHAPTER OPENER supports teachers with suggestions to engage students in mathematical conversations.

ENGLISH LANGUAGE SUPPORT provides strategies for teachers to guide and support students in learning and using mathematical language.

PROMOTING GROWTH highlights common learning difficulties that students may encounter in the chapter and provides strategies to help students overcome them.

INTERACTIVE CLASS PRESENTATIONS are time-saving and customizable with clearly displayed notes for teachers.

RECALL highlights the learning objectives of each question and provides questioning prompts for classroom discussions.

Readiness | Engagement | Mastery

Lesson 1

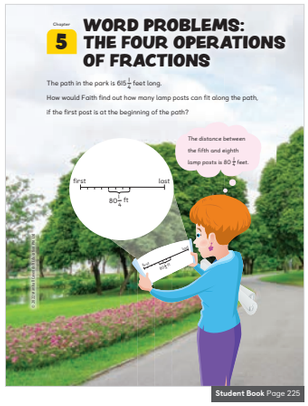
Chapter Opener (page 225)

20 minutes

The picture provides a real-world context for students to apply what they know about fractions and mixed numbers to solve problems involving fractions.

- You may use the Interactive Class Presentation to facilitate discussions and promote interactions.
- Display the picture. Invite students to share what they see. a park; a woman holding something that looks like a number line
- Group students in pairs or small groups. Encourage students to talk about other situations where they might encounter the use of fractions.
- You may facilitate discussions with these questions. Observe student discussions and pay attention to the language they use.

What do you know about the problem? the length of the path in the park **What does Faith have to do?** find how many lamp posts can fit along the path **What do you know about the lamp posts?** the distance between the fifth and eighth lamp posts **What do you need to find?** the number of lamp posts that can fit along the path **How many intervals are there between the fifth and eighth lamp posts?** 3 **How can you determine the distance between two lamp posts? How might you find the number of lamp posts along the path?**



Student Book Page 225

English Language Support

Encourage students to use these sentence frames to make sense of the problem. Some examples are shown below:

The length of the path is _____ feet. $615\frac{1}{4}$

The distance between the _____ and _____ lamp posts is _____ feet. fifth; eighth; $80\frac{1}{4}$

Promoting Growth

Make sure students are familiar with the different types of bar models to represent concepts such as part-whole, comparison, equal parts, and multiplicative comparison. Consider drawing a bar model on the board without numbers and invite students to come up with possible situations represented by the bar model.

For example:

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Readiness | Engagement | Mastery

Recall (pages 148 to 150)

30 minutes

Have students complete the **Recall** questions to check their readiness for the chapter. After students have answered all the questions, go through each of them by facilitating the following class activities and/or discussions. You may refer to the **Transition Guide** for additional resources. As an option, you may refer students to the online **Recall** questions. These online questions will be auto-graded. For questions that require students to show their work, have them do so in the Student Book.

Material(s)

- 1 set of fraction circles or tiles per pair or small group

QUESTION 1 assesses students' ability to find equivalent fractions.

- Provide students with fraction circles or tiles to find equivalent fractions of $\frac{1}{3}$.

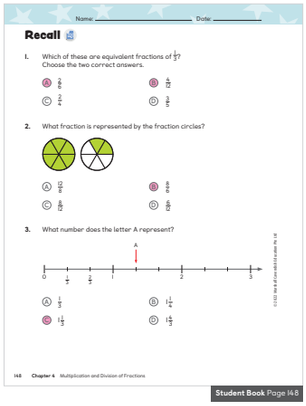
How do you know if two fractions are equivalent? Fractions are equivalent if I can multiply/divide the numerator and denominator of one of the fractions by the same number to get the other fraction.

QUESTION 2 assesses students' ability to identify improper fraction represented by the fraction circles.

How many equal parts are there in one whole? 6 **How many equal parts are shaded?** 8 **Is more than one whole shaded?** yes **What fraction can you write?** $\frac{8}{6}$

QUESTION 3 assesses students' ability to identify a fraction on a number line.

How can you determine the value of A on the number line? Each tick mark represents $\frac{1}{3}$. Since A is one tick mark past 1, I know it stands for $1\frac{1}{3}$.



Student Book Page 148

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I CAN STATEMENTS identify the learning goals for each lessons. These statements are used at Lesson Debrief for students to reflect on their learning.

LESSON OPENER provides teaching ideas for teachers to orchestrate concrete experiences in **TASK**.

LESSON DEVELOPMENT provides ideas for concrete experiences and support at different levels of mastery.

CAUTION highlights common errors and provides suggestions to rectify the errors.

ACTIVITY! provides the intent of the collaborative task, the steps to carry out the task, and suggested prompts to facilitate discussions.

LEARN TOGETHER gives prompts and questions to lead students towards deeper understanding.

EXTENSION provides suggestions to challenge students and help them apply concepts in different situations.

FOCUS QUESTION at the start of the lesson helps teachers shape the learning objectives of the lesson and enable students to keep the focus of the lesson in mind.

BEST PRACTICE provides tips and suggestions to engage students and better enhance students' learning.

Readiness | Engagement | Mastery

Lesson 5

4B Product of Fractions (1)

Focus Question
How can visual models help you multiply proper fractions to find the area of rectangles with fractional side lengths?

I CAN
- I can use visual models to multiply a proper fraction by a proper fraction.
- I can find the area of rectangles with fractional side lengths by tiling or by multiplying the side lengths.

Mathematical Practice(s)
- 2 Reason
- 4 Model
- 5 Use Tools
- 6 Use Math Language

Material(s)
- 3 sheets of rectangular paper per pair or small group

PRODUCT OF FRACTIONS (pages 169 to 174)

Lesson Opener
Task (page 169) 10 minutes

- You may use the appropriate digital manipulatives to support teaching and learning throughout the lesson(s) in Section 4B.
- Group students in pairs or small groups. Provide them with a sheet of rectangular paper.
- Have students work on the task. Observe student discussions.
- After students have attempted the task, use the following prompts to facilitate a class discussion. Pay attention to the language students use.

What do you know about the problem? $\frac{3}{4}$ of the flag was colored orange and $\frac{1}{2}$ of the colored part had stripes added **What do you need to find?** The fraction of the flag that was colored orange and had stripes. **How will you represent the problem using the rectangular paper?**

Lesson Development
Learn (page 169) 10 minutes

- Display the task on page 169.
- Have students compare their models with the one shown in the book.

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Name: _____ Date: _____

4B Product of Fractions

Alan designed a flag for an online game. He colored $\frac{3}{4}$ of the flag orange. He then added stripes on $\frac{1}{2}$ of the colored parts. What fraction of the flag was colored orange and striped?

$\frac{1}{2}$ of $\frac{3}{4}$ = ?

Learn

$\frac{3}{4}$ of the flag was colored orange.
$\frac{1}{2}$ of $\frac{3}{4}$ of the flag was colored orange and striped.

$\frac{1}{2} \times \frac{3}{4} = \boxed{\frac{1 \times 3}{2 \times 4}}$
$= \frac{3}{8}$

$\frac{3}{8}$ of the flag was colored orange and striped.

4B Product of Fractions 169

Student Book Page 169

What did you do first? I folded my paper into fourths and colored 3 parts orange. **What did you do next?** I folded my paper in half and drew stripes on half of the colored area. **How similar or different is your paper model to the model shown?**

- Write $\frac{1}{2} \times \frac{3}{4} = ?$ on the board.
- Point out that $\frac{1}{2}$ of $\frac{3}{4}$ is the same as $\frac{1}{2} \times \frac{3}{4}$.

How many parts are in the whole? 8 **What fraction of the flag was colored orange and striped?** 3 out of 8; $\frac{3}{8}$

- Complete the equation with students.

What do you notice about multiplying two proper fractions? I multiply the two numerators and the two denominators. **Can $\frac{3}{8}$ be simplified?** no

Best Practice

When folding the piece of paper to represent $\frac{1}{2} \times \frac{3}{4}$, students should fold the paper into fourths first, because they are finding $\frac{1}{2}$ of $\frac{3}{4}$. Invite students to share their models and

of $\frac{1}{2}$ and $\frac{3}{4}$ and the product of $\frac{3}{4}$ and $\frac{1}{2}$?

Learn Together

1. The model shows $\frac{1}{3}$ of $\frac{1}{2}$

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

$\frac{1}{3}$ of $\frac{1}{2} = \frac{1}{3} \times \frac{1}{2}$
$= \boxed{\frac{1 \times 1}{3 \times 2}}$
$= \frac{1}{6}$

170 Chapter 4 Multiplication and Division of Fractions

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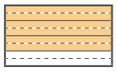
continued

Caution

Some students may fold the paper into quarters horizontally first, then fold in the same direction to show half.



Help students understand that when they fold it this way, they might notice that 6 parts are now colored. To find $\frac{1}{2}$ of the colored parts, they should think of $\frac{1}{2}$ of the 6 parts colored or $\frac{3}{6}$ of the whole.

Activity! (page 170) 10 minutes

- This activity reinforces students' understanding of multiplying proper fractions.
- Group students in pairs or small groups. Provide them with a sheet of rectangular paper.
- Invite students to fold and color the paper to show $\frac{3}{4}$ of $\frac{1}{2}$.

Group students in pairs or small groups to answer Questions 1 to 3. Provide them with a sheet of paper.

- **QUESTION 1** requires students to multiply proper fractions with the support of a bar model.
- Invite students to make a paper strip from the sheet of paper to show $\frac{1}{3}$ of $\frac{1}{2}$.

How can you show $\frac{1}{3}$ of $\frac{1}{2}$? What do you do first? What do you do next?

- Display the model on page 170. Encourage students to compare and discuss how similar or different their paper strips are from the model shown.

How similar or different is your paper strip compared to the model shown on the book? How many equal parts are there in the model? 6 **Why do you think there are 6 parts?** I divide the paper strip into halves first, then divide each half into 3 equal parts.

- **QUESTION 2** requires students to find the area of a rectangle with fractional side lengths using two methods, by tiling square units and by multiplying the side lengths.
- Remind students that finding area is to find the amount of space occupied by a figure.
- Have students cut out a square from a sheet of paper to represent the square of side length 1 yard.
- Invite students to fold the square paper into fourths vertically, then into thirds horizontally.
- Have students unfold the paper and observe the small rectangles formed by the fold lines.

How many small rectangles do you see? 12

- Lead students to see that in a rectangle measuring $\frac{3}{4}$ yard by $\frac{2}{3}$ yard, the side that is $\frac{3}{4}$ yard is made up of three $\frac{1}{4}$-yard units and the side that is $\frac{2}{3}$ yard is made up of two $\frac{1}{3}$-yard units.

What do you think is the area for one unit? $\frac{1}{12}$ square yard **How do you know?** I multiply $\frac{1}{4}$ by $\frac{1}{3}$. **How many units across show 1 yard?** 4 **What does $\frac{3}{4}$ yard mean?** It means 3 fourths of a yard.

170 Chapter 4 Multiplication and Division of Fractions

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Learn Together

1. Write as a power of 10.
   (a) $10 \times 10 \times 10 \times 10 \times 10 = 10^5$
   (b) $1{,}000{,}000 = 10^6$
   (c) $10{,}000{,}000 = 10^7$
2. Fill in the blanks.
   (a) $50 = 5 \times 10$
   $= 5 \times 10^1$
   (b) $500 = 5 \times 10 \times 10$
   $= 5 \times 10^2$
   (c) $5{,}000 = 5 \times 10 \times 10 \times 10 \times 10$
   $= 5 \times 10^3$
3. Write the powers of 10.
   (a) $460 = 46 \times 10^1$
   (b) $4{,}600 = 46 \times 10^2$
   (c) $46{,}000 = 46 \times 10^3$

20 Chapter 1 Multi-Digit Whole Numbers

Student Book Page 20

Student Book Page 21

continued

- Extend the task by inviting students to interpret and read other equations with exponents. For example, $10^5 = 10 \times 10 \times 10 \times 10 \times 10$.

English Language Support

Encourage students to discuss why 10^2 can also be read as 10 squared. Draw a square with side lengths of 10 centimeters and have students find the area of the square.
How do you find the area of the square? $10 \times 10 = 100$ square centimeters **10^2 is the same as finding the area of a square with side length of 10.**

Extension

Invite students to discuss and share why 10^3 can be read as 10 cubed. Have students draw a model and show their thinking.

What pattern do you notice about the exponent and the number of zeros in 10,000? They are the same. The exponent, 4, tells me the number of times the base, 10, is being multiplied in 10,000. There are 4 zeros in 10,000.

Learn Together (pages 20 and 21) 20 minutes

- Group students in pairs or small groups to answer Questions 1 to 6.
- **QUESTION 1** requires students to write the numbers in exponent form.

What do you understand by powers of 10? 10 is the base and the number of zeros at the end helps me to determine the exponent.

- **QUESTION 2** requires students to express numbers as powers of 10.

What do you notice about the number, 50? 50 is 5×10. **How can you write 5×10 as $5 \times$ a power of 10?** 5×10^1 **Is it necessary to write the exponent 1 in 5×10^1? Why or why not?** No, 10^1 is just 10. **How can you write 500 as a power of 10?** $500 = 5 \times 10 \times 10$; $10 \times 10 = 10^2$, so $500 = 5 \times 10^2$. **How can you write 5,000 as a power of 10?** $5{,}000 = 5 \times 10 \times 10 \times 10 \times 10$; $10 \times 10 \times 10 = 10^3$, so $5{,}000 = 5 \times 10^3$

- **QUESTION 3** requires students to interpret the product and write the powers of 10.

How can you determine the powers of 10? I can count the number of zeros behind 46 to determine the powers of 10.

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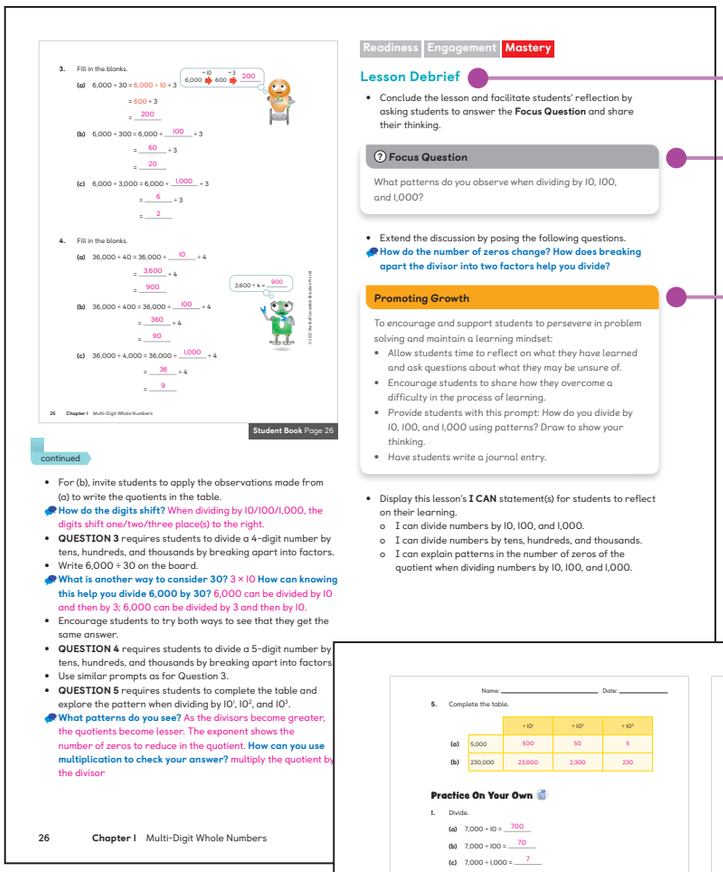
1B Multiply by Tens, Hundreds, and Thousands 20 – 21



3. Fill in the blanks.

(a) 6,000 ÷ 30 = 6,000 ÷ 10 ÷ 3
= 600 ÷ 3
= 200

(b) 6,000 ÷ 300 = 6,000 ÷ 100 ÷ 3
= 60 ÷ 3
= 20

(c) 6,000 ÷ 3,000 = 6,000 ÷ 1,000 ÷ 3
= 6 ÷ 3
= 2

4. Fill in the blanks.

(a) 36,000 ÷ 40 = 36,000 ÷ 10 ÷ 4
= 3,600 ÷ 4
= 900

(b) 36,000 ÷ 400 = 36,000 ÷ 100 ÷ 4
= 360 ÷ 4
= 90

(c) 36,000 ÷ 4,000 = 36,000 ÷ 1,000 ÷ 4
= 36 ÷ 4
= 9

26 Chapter 1 Multi-Digit Whole Numbers

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Readiness Engagement Mastery

Lesson Debrief

- Conclude the lesson and facilitate students' reflection by asking students to answer the **Focus Question** and share their thinking.

Focus Question

What patterns do you observe when dividing by 10, 100, and 1,000?

- Extend the discussion by posing the following questions.
  How do the number of zeros change? How does breaking apart the divisor into two factors help you divide?

Promoting Growth

To encourage and support students to persevere in problem solving and maintain a learning mindset:

- *Allow students time to reflect on what they have learned and ask questions about what they may be unsure of.*
- *Encourage students to share how they overcome a difficulty in the process of learning.*
- *Provide students with this prompt: How do you divide by 10, 100, and 1,000 using patterns? Draw to show your thinking.*
- *Have students write a journal entry.*

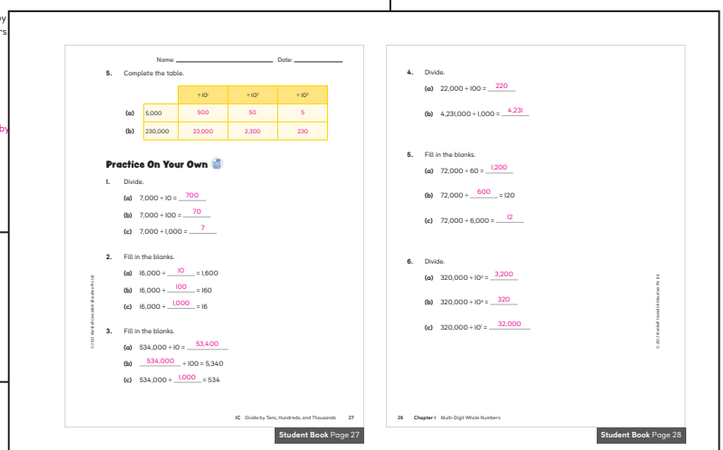
- Display this lesson's **I CAN** statement(s) for students to reflect on their learning.
  - I can divide numbers by 10, 100, and 1,000.
  - I can divide numbers by tens, hundreds, and thousands.
  - I can explain patterns in the number of zeros of the quotient when dividing numbers by 10, 100, and 1,000.

continued

- For (b), invite students to apply the observations made from (a) to write the quotients in the table.
  How do the digits shift? When dividing by 10/100/1,000, the digits shift one/two/three place(s) to the right.
- **QUESTION 3** requires students to divide a 4-digit number by tens, hundreds, and thousands by breaking apart into factors.
- Write 6,000 ÷ 30 on the board.
  What is another way to consider 30? 3 × 10 **How can knowing this help you divide 6,000 by 30?** 6,000 can be divided by 10 and then by 3; 6,000 can be divided by 3 and then by 10.
- Encourage students to try both ways to see that they get the same answer.
- **QUESTION 4** requires students to divide a 5-digit number by tens, hundreds, and thousands by breaking apart into factors.
- Use similar prompts as for Question 3.
- **QUESTION 5** requires students to complete the table and explore the pattern when dividing by 10^1, 10^2, and 10^3.
  What patterns do you see? As the divisors become greater, the quotients become lesser. The exponent shows the number of zeros to reduce in the quotient. **How can you use multiplication to check your answer?** multiply the quotient by the divisor

LESSON DEBRIEF wraps up the lesson by posing focus questions for students to articulate their understanding through conversation or journalling and for teachers to evaluate students' level of understanding.

FOCUS QUESTION serves as a reflection question for teachers to assess and evaluate students' learning. It also provides the opportunity for students to reflect and demonstrate how well they have learned in the lesson. Strategies to promote reflective thinking and a learning mindset are also provided in **Promoting Growth**.



Name: _____ Date: _____

5. Complete the table.

		÷ 10^1	÷ 10^2	÷ 10^3
(a)	5,000	500	50	5
(b)	230,000	23,000	2,300	230

Practice On Your Own

1. Divide.
   (a) 7,000 ÷ 10 = 700
   (b) 7,000 ÷ 100 = 70
   (c) 7,000 ÷ 1,000 = 7

2. Fill in the blanks.
   (a) 16,000 ÷ 10 = 1,600
   (b) 16,000 ÷ 100 = 160
   (c) 16,000 ÷ 1,000 = 16

3. Fill in the blanks.
   (a) 534,000 ÷ 10 = 53,400
   (b) 534,000 ÷ 100 = 5,340
   (c) 534,000 ÷ 1,000 = 534

IC Divide by Tens, Hundreds, and Thousands 27

Student Book Page 27

4. Divide.
   (a) 22,000 ÷ 100 = 220
   (b) 4,231,000 ÷ 1,000 = 4,231

5. Fill in the blanks.
   (a) 72,000 ÷ 60 = 1,200
   (b) 72,000 ÷ 600 = 120
   (c) 72,000 ÷ 6,000 = 12

6. Divide.
   (a) 320,000 ÷ 10^2 = 3,200
   (b) 320,000 ÷ 10^3 = 320
   (c) 320,000 ÷ 10^5 = 32,000

28 Chapter 1 Multi-Digit Whole Numbers

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Practice On Your Own (pages 27 and 28) 10 minutes

If you would like the questions to be auto-graded, refer students to online **Practice On Your Own** as a lesson check. If you want students to show their work, have them do so in the Student Book.

- **QUESTION 1** assesses students' ability to find the quotient when dividing by 10, 100, and 1,000.
- **QUESTION 2** assesses students' ability to determine the missing divisor 10, 100, or 1,000 for each equation.
- **QUESTION 3** assesses students' ability to identify the missing numbers in equations involving division by 10, 100, and 1,000.
- **QUESTION 4(a)** assesses students' ability to divide a 5-digit number by 100.
- **QUESTION 4(b)** assesses students' ability to divide a 7-digit number by 1,000.
- **QUESTION 5** assesses students' ability to divide numbers by tens, hundreds, and thousands.
- **QUESTION 6** assesses students' ability to divide numbers by powers of 10.

Additional Support

*For **Question 5(a)**, encourage students to show how the divisor, 60, can be factored into 10 and 6, then have students divide 72,000 by 10 first, before dividing by 6. Repeat this procedure with **Questions 5(b)** and **5(c)**.*

Refer to **Differentiated Instruction** on page 28A to provide students with additional support, on-level practice, or extension.

You may assign **Mastery and Beyond 5A, Chapter 1, Practice 4** to provide further support and development to sustain learning.

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PRACTICE ON YOUR OWN provides the learning objective of each question as well as describes the variation between questions for mastery of the lesson.

ADDITIONAL SUPPORT provides suggestions for students who might need extra help understanding concepts.

value of a digit in one place is $\frac{1}{10}$ of what it represents in the place to its left, and is 10 times what it represents in the place to its right.

students with additional support, on-level practice, or extension.

You may assign **Mastery and Beyond 5A, Chapter 1, Practice 1** to provide further support and development to sustain learning.

Think!

- **QUESTION 8** assesses students' ability to make the greatest odd number and the least even number given a set of digits.
  What digits can be in the ones place to be an odd number? 1, 5, 7, or 9 **What digits can be in the ones place to be an even number?** 2, 4, or 6 **How do you determine which number should go in the millions place?** The greatest number would need to have the greatest digit, 9, in the millions place. The least number would need the least digit, 1, in the millions place.

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THINK! provides higher-order thinking questions and prompts to facilitate discussions.

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DIFFERENTIATED INSTRUCTION suggests activities for students at different levels of mastery.

CHAPTER WRAP UP provides ideas to encourage reflection, consolidation of learning, and reviewing of key ideas.

PERFORMANCE TASK outlines the objectives of each question and provides prompts to facilitate students' self-awareness, monitoring, and learning.

Differentiated Instruction

Additional Support

Material(s): connecting cubes, Square Grid (TR04)

- Write 4 + 3 × 2 on the board and have students model the expression with connecting cubes.
- Similarly, write (4 + 3) × 2 on the board and have students model the expression with connecting cubes.
- Guide students to find the value for each expression using the connecting cubes.
- Prompt students to share and discuss how the two expressions are different.

How did you represent each expression using connecting cubes? Do both expressions have the same value? Why or why not?

- Assign **Reteach 5** and/or **Additional Practice 5A**, **Exercise 2A (2)** as appropriate to each student.

On-Level Practice

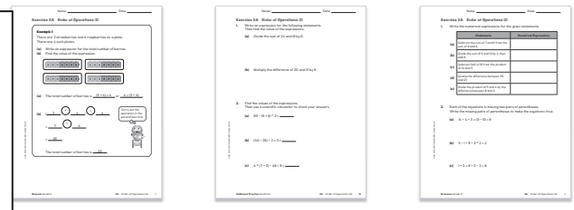
- Encourage students to summarize their learning and make connections to what they have previously learned. Invite them to give examples to show their thinking. Help them begin by asking the following questions.

How do you write numerical expressions using parentheses? Where do you write the parentheses? How does Order of operations help you evaluate and interpret expressions?

- If time permits, encourage students to discuss their work and share their ideas.
- Assign **Additional Practice 5A** and/or **Extension 5**, **Exercise 2A (2)** as appropriate to each student.

Extension

- Assign **Additional Practice 5A** and/or **Extension 5**, **Exercise 2A (2)** as appropriate to each student.
- Encourage students to summarize their learning, make connections to what they have previously learned, and challenge them to ask questions regarding what they want to learn more about.
- If time permits, encourage students to discuss their work and share their ideas.



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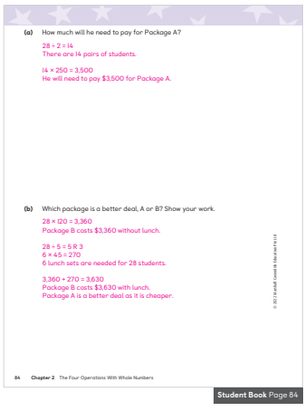

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Readiness Engagement Mastery

Lesson 12

Chapter Wrap Up

- Before students work on **Performance Task**, help them recall what they have learned in the chapter using the **Chapter Self-Reflection** on page 90B.

English Language Support

Guide students to create a list of the key vocabulary words in the chapter. Help reinforce the vocabulary using the following statements.

1. An example of an _____ is 15 − 6 + 4. expression
2. In the expression 2 × (4 + 5), we have to add 4 and 5 first because of the _____. parentheses
3. We use the _____ to know the order in which to perform the operations. order of operations
4. In the expression 125 − 5 × (18 ÷ 2), we _____ first, then we _____, and finally _____. divide; multiply; subtract

Readiness Engagement Mastery

Performance Task (pages 83 to 86)

- Refer students to the **Performance Task** and explain that it will help them consolidate and deepen their understanding of the chapter through tasks that require them to show, explain, and/or apply their thinking.
- Display the rubric to encourage students to set their own goals.

QUESTION (a) requires students to use the division and multiplication to find the cost of Package A.

What do you know about the relationship between the admission price and the number of students? How can that help you find the cost of Package A?

QUESTION (b) requires students to determine if Package A or B is a better deal.

What do you need to find first? What do you need to find next? What do you need to consider when determining the cost of the lunch sets? How can you find the total cost of Package B? Which is a better deal?

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RUBRIC provides the scoring guide for each question in the Performance Task and relates the points scored to the criteria given.

Name: _____ Date: _____

How Did I Do?

	My work is accurate. I explain my thinking clearly. I can apply my thinking in word problems. I can justify why my strategy fits the situation.
	I am mostly accurate. I explain my thinking clearly. I can apply my thinking to calculations. I can use multiple strategies.
	I show little work. I do not explain my thinking clearly. I am struggling with word problems. I can only think of one way to solve a problem.

My Teacher's Words

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Scoring Rubric

	Description	Point(s)
1	The student: • correctly finds the number of pizza slices. • draws a model to support their answer.	0.5 0.5
2	The student: • correctly identifies two possible combinations. • explains their thinking through their models.	1 1
3(a)	The student: • correctly finds the amount of pizza sold on Wednesday.	1
3(b)	The student: • correctly finds the least and greatest possible amount of money the pizzeria could have made. • uses a table to systematically arrive at their conclusion.	2 2
	Total	**8**

- Use this table as a guide to help you relate students' scores to their performance levels.

Level	Score
	7 – 8
	2.5 – 6.5
	0 – 2

Rubric (page 141)

- Use the scoring guide to help you give feedback on students' work. Use the comments section to provide information about what was done well and what could be improved. Write words of encouragement to let the students know what they have done well.

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STEAM Project Work

Perfect Slime Recipe

Do you know that slime is neither liquid nor solid? What makes slime sticky and stretchy so that you can pull and play with it? One of the ingredients used in making slime is glue. What other ingredients do you think you would need to make slime?

Task

1. Use the internet to learn about the science behind making slime and find some homemade slime recipes.
2. Create your own slime recipe using fractions and mixed numbers.
3. Make the slime using your recipe. You may need to experiment with the amount of ingredients and/or the type of ingredients to perfect your recipe.
4. Write the instructions by including addition, subtraction, multiplication, and division of fractions and mixed numbers.
5. Compare your slime with your classmates. How does the slime flow differently?
6. Share your recipe with your classmates and have them convert the fractions and mixed numbers to decimals.

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1. What is the sum of $\frac{1}{3}$ and $\frac{2}{27}$?
   (A) $\frac{2}{81}$ (B) $\frac{4}{81}$
   (C) $\frac{5}{81}$ (D) $\frac{7}{81}$
2. What is the difference between $\frac{8}{9}$ and $\frac{5}{27}$?
   (A) $\frac{1}{18}$ (B) $\frac{2}{9}$
   (C) $\frac{1}{2}$ (D) $\frac{38}{81}$
3. Add. Write the answers in simplest form.
   (a) $\frac{3}{5} + \frac{5}{6}$
   $= \frac{18}{30} + \frac{25}{30}$
   $= \frac{43}{30}$
   $= 1\frac{13}{30}$
   (b) $2\frac{7}{10} + 4\frac{1}{6}$
   $= 2\frac{21}{30} + 4\frac{5}{30}$
   $= 6\frac{26}{30}$
   $= 6\frac{13}{15}$
4. Subtract. Write the answers in simplest form.
   (a) $\frac{13}{18} - \frac{1}{3}$
   $= \frac{13}{18} - \frac{6}{18}$
   $= \frac{7}{18}$
   (b) $4\frac{2}{7} - 2\frac{5}{9}$
   $= 4\frac{18}{63} - 2\frac{35}{63}$
   $= 3\frac{81}{63} - 2\frac{35}{63}$
   $= 1\frac{46}{63}$

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Readiness Engagement **Mastery**

Lesson 9

STEAM Project Work (Chapter 3, page 142)

- Students are given an opportunity to make connections between science and mathematics in this project work.
- At the end of **Chapter 3**, students should be able to complete **Parts 1** and **2**.
- For **Part 1**, students are required to use the internet to research the science behind making slime and find some homemade slime recipes.
- For **Part 2**, students are required to make their own slime recipe using fractions and mixed numbers.

Readiness Engagement **Mastery**

Lessons 10–11

Chapter Practice (pages 143 to 146)

- Assign **Chapter Practice** in the Student Book to help students consolidate and extend their understanding of the chapter.
- You may find a summary of the chapter learning outcomes linked to the leveled questions of **Chapter Practice** on the next page.
- Teaching prompts are provided for Levels 2 and 3 questions.
- Assign **Additional Practice 5A, Chapter Practice** to students as homework.

STEAM PROJECT WORK provides a reminder of the ongoing project and the stage students should be at.

CHAPTER PRACTICE links the learning outcome(s) of each lesson to a question to help teachers identify gaps in students' learning. It also indicates the difficulty level of the questions based on Depth of Knowledge.

Question	Level	Chapter 6 Learning Outcome(s)	Section(s)	Lesson(s)
1	1	Read and write decimals to thousandths.	6A	2
2	1	Read and write decimals to thousandths.	6A	2
3	1	Read and write decimals to thousandths. Read and write thousandths in decimal and fractional form. Express fractions as decimals.	6A	2, 4
4	1	Read and write decimals to thousandths.	6A	2
5	1	Compare and order decimals to thousandths.	6A	3
6	1	Compare two decimals using >, <, or =.	6A	3
7	1	Express decimals as fractions in simplest form.	6A	4
8	1	Read and write decimals to thousandths in expanded and fractional form.	6A	2
9	1	Use place value understanding to round decimals to the nearest whole number, tenth, or hundredth.	6B	5
10	2	Compare and order decimals to thousandths. Express fractions as decimals.	6A	3, 4
11	3	Read and write decimals to thousandths. Express decimals as fractions in simplest form.	6A	2, 4
12	3	Use place value understanding to round decimals to the nearest whole number, tenth, or hundredth.	6B	5

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11. PROBLEM Use the following clues to solve a 7-digit secret code.

- The digit in the ten thousands place is 6.
- The digit in the ten thousands place is 3 times the digit in the hundred thousands place.
- The digit in the thousands place is twice the digit in the hundred thousands place.
- The digit in the ones place is 5 more than the digits in the hundred thousands place.
- The digit in the ones place is 2 less than the digit in the millions place.
- The digit in the millions place is 1 more than the digit in the hundreds place.
- The digit in the tens place is 4 less than the digit in the millions place.

What is the 7-digit secret code?

9 2 6 4 8 5 7

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Readiness Engagement Mastery

Lessons 10–11

Chapter Test

- Assign **Chapter Test 1** digitally to assess students' understanding of the chapter.
- If you want students to show their work, print out the test in **Assessment Guide Teacher Edition** and have students do so on their copy.

CHAPTER TEST is a summative assessment to assess students' understanding of the chapter.

QUESTION 9 requires students to use what they know about place-value to

- **(a)** reason if a number made with the given digits is the greatest number.
- **(b)** make the greatest number with the given digits and construct viable arguments to support their answer.

Does your answer make sense? Why or why not? How can you justify your answer? What convinced you that your answer is correct?

QUESTION 10 requires students to identify and reason the pattern to multiply a 3-digit number by thousands or powers of 10.

Where might you start studying the pattern? How can you express 3,000 using powers of 10?

QUESTION 11 requires students to use clues and their understanding of place value to solve a 7-digit code.

Where would you start? How might a place-value chart help you keep track of the digits in the number? Does your answer make sense?

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CHAPTER SELF-REFLECTION provides students the opportunity to reflect on their learning.

Chapter Self-Reflection

Check (✓) to show what I can do.

I Can	Yes	Not Sure	No
read and write numbers to 10 million.			
state the value of each digit in multi-digit numbers.			
recognize that the value of a digit in one place is 10 times what it represents in the place to its right.			
recognize that the value of a digit in one place is $\frac{1}{10}$ of what it represents in the place to its left.			
multiply numbers by 10, 100, and 1,000.			
multiply numbers by tens, hundreds, and thousands.			
explain patterns in the number of zeros of the product when multiplying numbers by 10, 100, and 1,000.			
use whole number exponents to write powers of 10.			
multiply numbers by powers of 10.			
explain patterns in the number of zeros of the product when multiplying a number by powers of 10.			
divide numbers by 10, 100, and 1,000.			
divide numbers by tens, hundreds, and thousands.			
explain patterns in the number of zeros of the quotient when dividing numbers by 10, 100, and 1,000.			

MY JOURNAL

I can show...	I still wonder...

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Developed by an expert panel

Bring the best practices of seasoned educators, developers of teachers, and champions of **Singapore Math®** into your classroom!

Consultants

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played a key role in putting Singapore Mathematics on the world map and is responsible for shaping Singapore's mathematics curriculum development. As a Project Director for the Primary Mathematics Project at Ministry of Education (MOE), Singapore, Dr. Kho led a team of curriculum specialists to create high-quality teaching and learning materials, and to develop the Model Method in the 1980s. This method is a pictorial way to represent mathematical quantities, and has proven to be a very successful problem solving tool over the decades.

Dr. Kho was a Mathematics teacher before becoming a lead curriculum designer, and then a principal curriculum specialist in MOE until his retirement. He was also a consultant to the MOE Mathematics Unit, Curriculum Planning and Development Division, and oversaw the school mathematics syllabus formulations since the late 1970s and remained involved in an advisory role in recent syllabus revisions.

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U.S. Consultant

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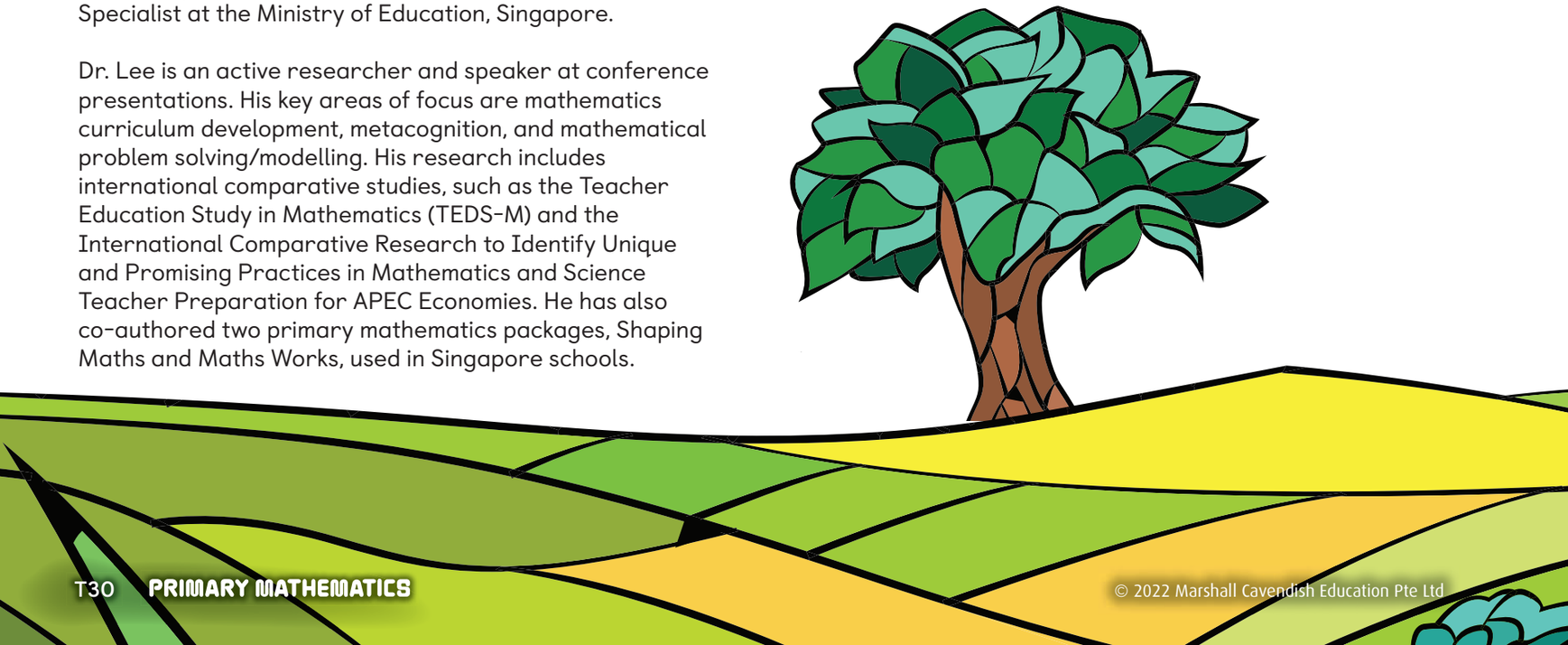
began her career as an educator in 1988. Since then, she has gathered more than 30 years of experience as a K-12 Special Education teacher, licensed math interventionist, public and private school teacher, principal, and District Math Coordinator. Susan also served as a curriculum consultant to Turnaround districts and is an Affiliate Professor of Special Education, Principal Licensure, and Teacher Leadership at a local university.

A seasoned champion of Singapore Math®, Susan is working with students, teachers, coaches, and administrators to implement Singapore Math® strategies in the United States and other countries.



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Janice has a Bachelor of Arts in Elementary and Special Education, a Master of Arts in Educational Processes, and a Doctorate in Education in Educational Leadership/ Administration.

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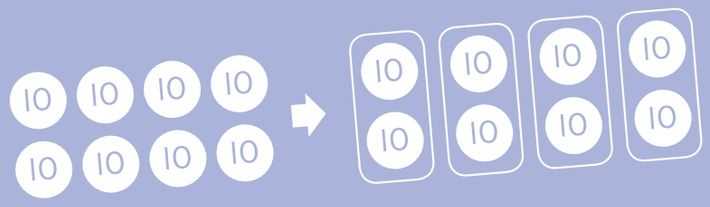
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	7	9	9	0	4	6

$$8 \times (4 + 3) = 8 \times 4 + 8 \times 3$$

8 3 5 5 6 4 7



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