Scope and Sequence for Grade 5

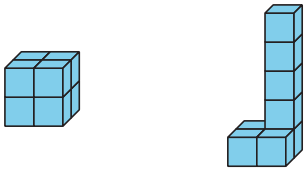
The big ideas in IM Grade 5 include: developing fluency with addition and subtraction of fractions, and developing understanding of multiplication and division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); extending understanding of division to two-digit divisors; developing understanding of operations with decimals to hundredths, and developing fluency with whole- number and decimal operations; and developing understanding of volume.

Unit 1: Finding Volume

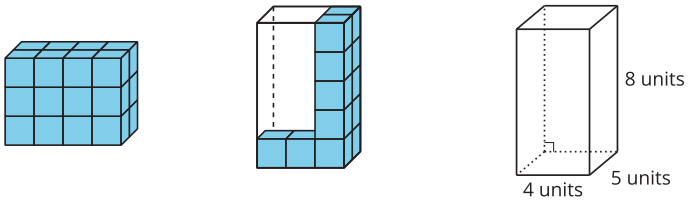
This unit introduces students to the concept of volume by building on their understanding of area and multiplication.

In grade 3, students learned that the area of a two-dimensional figure is the number of square units that cover it, without gaps or overlaps. Students first found areas by counting squares and began to intuit that area is additive. Later, they recognized the area of a rectangle as a product of its side lengths and found the areas of more-complex figures composed of rectangles.

Here, students learn that the volume of a solid figure is the number of unit cubes that fill it without gaps or overlaps. First, they measure volume by counting unit cubes and observe its additive nature. They also learn that different solid figures can have the same volume.

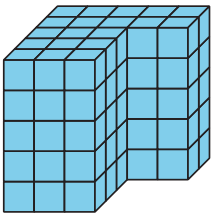


Next, students shift their focus to right rectangular prisms: building them using unit cubes, analyzing their structure, and finding their volumes. They write numerical expressions to represent their reasoning strategies and work with increasingly abstract representations of prisms.



Later, students generalize that the volume of a rectangular prism can be found by multiplying its side measurements (length $\times$ width $\times$ height), or by multiplying the area of the base by its height (area of the base $\times$ height). As they analyze, write, and evaluate different expressions that represent the volume of the same prism, students revisit familiar properties of operations from earlier grades.

Later in the unit, students apply these understandings to find the volume of a solid figure composed of two non-overlapping rectangular prisms and to solve real-world problems involving such figures. In doing so, they also progress from using cubes to using standard units to measure volume.



Section A: Unit Cubes and Volume

- Lesson 1: What Is Volume?
- Lesson 2: Measure Volume
- Lesson 3: Volume of Prism Drawings
- Lesson 4: Use Layers to Determine Volume

Section B: Expressions for Finding Volume

- Lesson 5: Side Lengths of Rectangular Prisms
- Lesson 6: Expressions for Volume
- Lesson 7: Cubic Units of Measure

Section C: Volumes of Solid Figures

- Lesson 8: Figures Made of Prisms
- Lesson 9: Measure Figures Made from Prisms
- Lesson 10: Represent Volume with Expressions
- Lesson 11: All Kinds of Prisms
- Lesson 12: Tons and Tons of Garbage

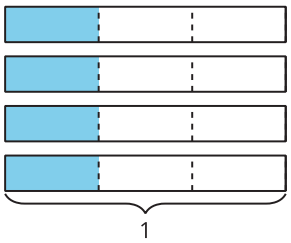
Unit 2: Fractions as Quotients and Fraction Multiplication

In this unit, students learn to interpret a fraction as a quotient and extend their understanding of multiplication of a whole number and a fraction.

In IM Grade 3, students made sense of multiplication and division of whole numbers in terms of equal-size groups. In IM Grade 4, they used multiplication to represent equal-size groups with a fractional amount in each group and to express comparison.

For instance, $4 \times \frac{1}{3}$ can represent "4 groups of $\frac{1}{3}$" or "4 times as much as $\frac{1}{3}$."

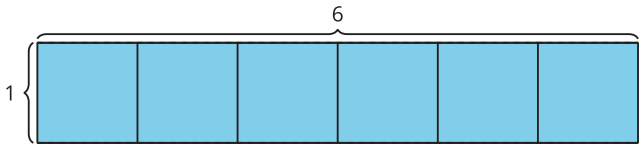
The amount in both situations can be represented by the shaded parts of a diagram like this:

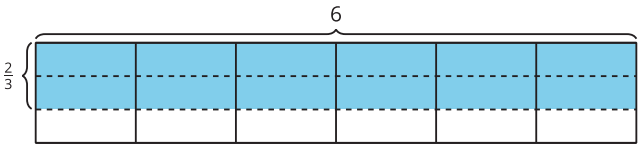


Students learn that a fraction like $\frac{4}{3}$ can also represent:

- A division situation, where 4 objects are being shared equally by 3 people, or $4 \div 3$.
- A fraction of a group, in this case, $\frac{1}{3}$ of a group of 4 objects, or $\frac{1}{3} \times 4$.

Students also interpret the product of a whole number and a fraction in terms of the side lengths of a rectangle. The expression 6×1 represents the area of a rectangle that is 6 units by 1 unit. In the same way, $6 \times \frac{2}{3}$ represents a rectangle that is 6 units by $\frac{2}{3}$ unit.





The commutative and associative properties become evident as students connect different expressions to the same diagram. The distributive property is used as students multiply a whole number and a fraction written as a mixed number, for instance: $2 \times 3\frac{2}{5} = (2 \times 3) + (2 \times \frac{2}{5})$.

Throughout this unit, it is assumed that the sharing is always equal sharing, whether explicitly stated or not. For example, in the situation above, 4 objects are being shared equally by 3 people.

Section A: Fractions as Quotients

- Lesson 1: Share Sandwiches
- Lesson 2: Share More Sandwiches
- Lesson 3: Interpret Equations
- Lesson 4: Division Situations
- Lesson 5: Relate Division and Fractions

Section B: Fractions of Whole Numbers

- Lesson 6: Relate Division and Multiplication
- Lesson 7: Divide to Multiply Unit Fractions
- Lesson 8: Divide to Multiply Non-Unit Fractions

Section C: Area and Fractional Side Lengths

- Lesson 9: Relate Area to Multiplication
- Lesson 10: Fractional Side Lengths Less than 1
- Lesson 11: Fractional Side Lengths Greater than 1
- Lesson 12: Decompose Area
- Lesson 13: Area and Properties of Operations
- Lesson 14: Area Situations
- Lesson 15: Multiply More Fractions
- Lesson 16: Estimate Products
- Lesson 17: Mosaic Pictures

Unit 3: Multiplying and Dividing Fractions

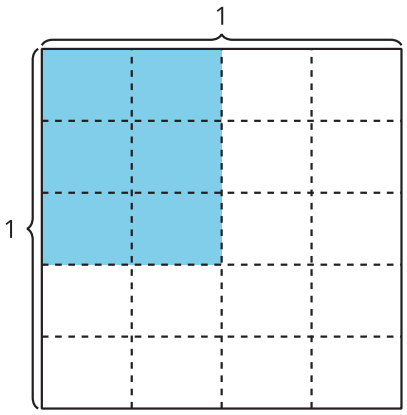
In this unit, students find the product of two fractions, divide a whole number by a unit fraction, and divide a unit fraction by a whole number.

Previously, students made sense of multiplication of a whole number and a fraction in terms of the side lengths and area of a rectangle. In this unit, students make sense of multiplication of two fractions the same way. Students interpret area diagrams with two unit fractions for their side lengths, a unit fraction and a non-unit fraction, and then two non-unit fractions.

Through repeated reasoning, students notice regularity in the value of the product (MP8). They generalize that it can be found by multiplying the numerators and multiplying the denominators of the factors:

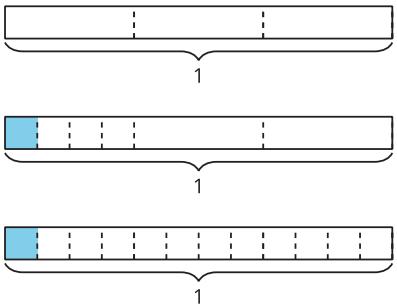
$$\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$$

For example, $\frac{2}{4} \times \frac{3}{5}$ is $\frac{2 \times 3}{4 \times 5}$ because there are 4×5 equal parts in the whole square and 2×3 parts are shaded.



Next, students make sense of division situations and expressions that involve a whole number and a unit fraction. They recall that division can be understood in terms of finding the number of equal-size groups or finding the size of each group.

For instance, students interpret $\frac{1}{3} \div 4$ to mean finding the size of one part if $\frac{1}{3}$ is split into 4 equal parts, and $4 \div \frac{1}{3}$ to mean finding how many $\frac{1}{3}$s are in 4.



Students consider how changing the dividend or the divisor changes the value of the quotients and look for patterns (MP8). They use tape diagrams to represent and reason about division situations and expressions.

Later in the unit, students apply what they learned to solve problems. The relationship between multiplication and division is reinforced when they notice that both operations can be used to solve the same problem.

Section A: Fraction Multiplication

- Lesson 1: One Piece of One Part
- Lesson 2: Represent Unit Fraction Multiplication
- Lesson 3: Multiply Unit Fractions
- Lesson 4: Situations about Multiplying Fractions
- Lesson 5: Multiply a Unit Fraction by a Non-Unit Fraction
- Lesson 6: Multiply Fractions
- Lesson 7: Generalize Fraction Multiplication
- Lesson 8: Work with Mixed Numbers
- Lesson 9: Apply Fraction Multiplication

Section B: Fraction Division

- Lesson 10: Concepts of Division
- Lesson 11: Divide Unit Fractions by Whole Numbers
- Lesson 12: Represent Division of Unit Fractions by Whole Numbers
- Lesson 13: Divide Whole Numbers by Unit Fractions
- Lesson 14: Represent Division of Whole Numbers by Unit Fractions
- Lesson 15: Fraction Division Situations
- Lesson 16: Reason about Quotients

Section C: Problem Solving with Fractions

- Lesson 17: Fraction Multiplication and Division Situations
- Lesson 18: Represent Situations with Multiplication and Division
- Lesson 19: Fraction Games
- Lesson 20: Recipes and Fractions

Unit 4: Wrapping Up Multiplication and Division with Multi-digit Numbers

In this unit, students multiply multi-digit whole numbers, using the standard algorithm, and begin working toward end-of-grade expectations for fluency. They also find whole-number quotients, with up to four-digit dividends and two-digit divisors.

In IM Grade 4, students used strategies based on place value and the properties of operations to multiply a whole number of up to four digits by a one-digit whole number, and to multiply a pair of two-digit numbers. They decomposed the factors by place value, and used diagrams and algorithms using partial products to record their reasoning.

Here, students build on those strategies to make sense of the standard algorithm for multiplication. They recognize that it also is based on place value but records the partial products in a condensed way.

Han and Elena used different algorithms to find the value of 3×318.

Han

$$\begin{array}{r} 318 \\ \times \quad 3 \\ \hline 24 \\ 30 \\ +\ 900 \\ \hline 954 \end{array}$$

Elena

$$\begin{array}{r} 2 \\ 318 \\ \times \quad 3 \\ \hline 954 \end{array}$$

Explain to your partner what Han and Elena did. What does the 2 represent in Elena's algorithm?

In grade 4, students also found whole-number quotients, using place-value strategies and the relationship between multiplication and division. They decomposed dividends in various ways and found partial quotients. The numbers they encountered then were limited to four-digit dividends and one-digit divisors. In this unit, they extend that work to include two-digit divisors.

As they build their facility with multi-digit multiplication and division, students solve problems about area and volume and reinforce their understanding of these concepts.

Section A: Multi-digit Multiplication Using the Standard Algorithm

- Lesson 1: Estimate and Find Products
- Lesson 2: Partial Products in Diagrams
- Lesson 3: Partial Products in Algorithms
- Lesson 4: Standard Algorithm: One-digit and Multi-digit Numbers, with Composing
- Lesson 5: Standard Algorithm: Multi-digit Numbers, without Composing
- Lesson 6: Standard Algorithm: Multi-digit Numbers, with Composing
- Lesson 7: Build Multiplication Fluency
- Lesson 8: The Birds

Section B: Multi-digit Division Using Partial Quotients

- Lesson 9: World's Record Folk Dance
- Lesson 10: Different Partial Quotients

- Lesson 11: A Partial-Quotients Algorithm
- Lesson 12: Divide, Using Partial Quotients
- Lesson 13: Practice a Partial-Quotients Algorithm
- Lesson 14: Find Unknown Side Lengths
- Lesson 15: World's Record Noodle Soup
- Lesson 16: Fractions as Partial Quotients

Section C: Let's Put It to Work

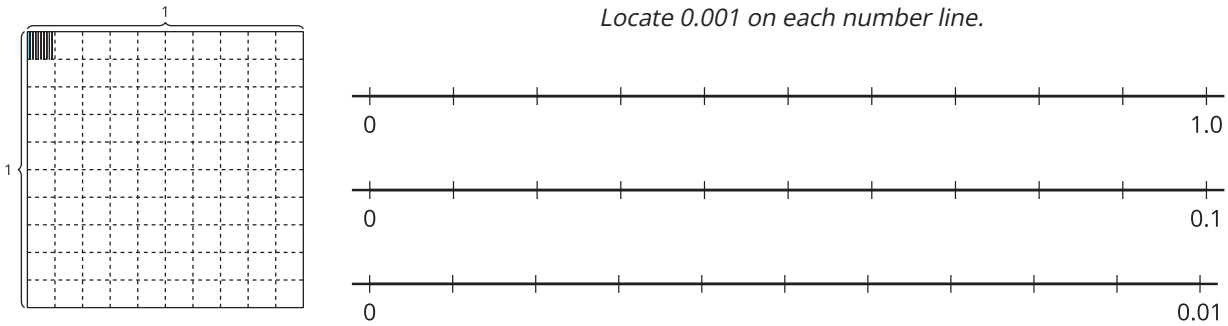
- Lesson 17: A Lot of Milk
- Lesson 18: Trash Talk
- Lesson 19: Shipping Trash
- Lesson 20: Food-Waste Journal

Unit 5: Place Value Patterns and Decimal Operations

In this unit, students expand their knowledge of decimals to read, write, compare, and round decimals to the thousandths. They also extend their understanding of place value and numbers in base ten by performing operations on decimals to the hundredth.

In IM Grade 4, students wrote fractions with denominators of 10 and 100 as decimals. They recognized that the notations 0.1 and $\frac{1}{10}$ express the same amount and are both called "one tenth." Students used hundredths grids and number lines to represent and compare tenths and hundredths.

Students rely on diagrams and their understanding of fractions to make sense of decimals to the thousandths. They see that "one thousandth" refers to the size of one part if a hundredth is partitioned into 10 equal parts, and that its decimal form is 0.001. Diagrams help students visualize the magnitude of each decimal place and compare decimals.



Students then apply their understanding of decimals and of whole-number operations to add, subtract, multiply, and divide decimal numbers to the hundredths, using strategies based on place value and the properties of operations.

Students see that the reasoning strategies and algorithms they used to operate on whole numbers are also applicable to decimals. For example, addition and subtraction can be done by attending to the place value of the digits in the numbers, and multiplication and division can still be understood in terms of equal-size groups.

In IM Grade 6, students will build on the work to reach the expectation to fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Section A: Numbers to Thousandths

- Lesson 1: What Is a Thousandth?

- Lesson 2: Thousandths on Diagrams and in Words
- Lesson 3: Thousandths in Expanded Form
- Lesson 4: Explore Place Value Relationships
- Lesson 5: Compare Decimals
- Lesson 6: Compare Decimals on the Number Line
- Lesson 7: Round Doubloons
- Lesson 8: Round Decimals
- Lesson 9: Order Decimals
- Lesson 10: Solve Problems with Decimals

Section B: Add and Subtract Decimals

- Lesson 11: Make Sense of Decimal Addition
- Lesson 12: Estimate and Add
- Lesson 13: Analyze Addition Mistakes
- Lesson 14: Make Sense of Decimal Subtraction
- Lesson 15: Estimate and Subtract
- Lesson 16: Addition and Subtraction

Section C: Multiply Decimals

- Lesson 17: Multiply Decimals and Whole Numbers
- Lesson 18: Use Whole Number Facts
- Lesson 19: Use Properties to Multiply Decimals
- Lesson 20: Products in the Hundredths Place
- Lesson 21: Multiply More Decimals

Section D: Divide Decimals

- Lesson 22: Divide Whole Numbers by 0.1 and 0.01
- Lesson 23: Divide Whole Numbers by Decimals
- Lesson 24: Divide Decimals by Whole Numbers
- Lesson 25: Divide Decimals by Decimals
- Lesson 26: Book Fair

Unit 6: More Decimal and Fraction Operations

In this unit, students deepen their understanding of place-value relationships of numbers in base ten, unit conversion, operations on fractions with unlike denominators, and multiplicative comparison. The work here builds on several important ideas from grade 4.

In grade 4, students learned the value of each digit in a whole number is 10 times the value of the same digit in a place to its right. Here, they extend that insight to include decimals to the thousandths. Students recognize that the value of each digit in a place (including decimal places) is $\frac{1}{10}$ the value of the same digit in the place to its left.

This idea is highlighted as students perform measurement conversions in metric units.

Previously, students learned to convert from a larger unit to a smaller unit. Here, they learn to convert from a smaller unit to a larger unit. They observe how the digits shift when multiplied or divided by a power of 10 and learn to use exponential notation for powers of 10 to represent large numbers.

L	mL
5	
6.3	
0.95	
10^2	
	800,000
	10^6
	65

Next, students turn their attention to fractions. In earlier grades, students made sense of equivalent fractions, added and subtracted fractions with the same denominator, and added tenths and hundredths. In this unit, they add and subtract fractions with different denominators. They see that the key is to find a common denominator and analyze different techniques for doing so.

Students then solve problems that involve measurement data (in halves, fourths, and eighths) that are displayed on line plots.

In the final section, students reason about the size of a product of fractions and the sizes of the factors. This work builds on the multiplicative comparison work in grade 4, in which students compared a whole number as "_____ times as many (or as much) as" another whole number. Here, students reason about products of a whole number and a fraction, without finding the value of each product. They use diagrams and expressions to support their reasoning.

Write >, <, or = in each blank to make true statements.

$\frac{4}{5} \times 851$ ____ 851 $\qquad$ $\frac{1}{4}$ ____ $\frac{5}{5} \times \frac{1}{4}$ $\qquad$ $\frac{99}{8} \times \frac{23}{22}$ ____ $\frac{99}{8}$ $\qquad$ $\frac{100}{7} \times \frac{9}{13}$ ____ $\frac{9}{13}$

Section A: Measurement Conversions and Powers of 10

- Lesson 1: Place-Value Patterns
- Lesson 2: Powers of 10
- Lesson 3: Metric Conversion and Multiplication by Powers of 10
- Lesson 4: Metric Conversion and Division by Powers of 10
- Lesson 5: Multi-step Conversion Problems: Metric Lengths
- Lesson 6: Multi-step Conversion Problems: Metric Liquid Volumes
- Lesson 7: Multi-step Conversion Problems: Customary Lengths

Section B: Add and Subtract Fractions with Unlike Denominators

- Lesson 8: Add and Subtract Fractions
- Lesson 9: Use Expressions with the Same Value
- Lesson 10: All Sorts of Denominators
- Lesson 11: Different Ways to Subtract

 CC BY NC 2024 Illustrative Mathematics®

- Lesson 12: Solve Problems
- Lesson 13: Put It All Together: Add and Subtract Fractions
- Lesson 14: Representing Fractions on a Line Plot
- Lesson 15: Problem Solving with Line Plots

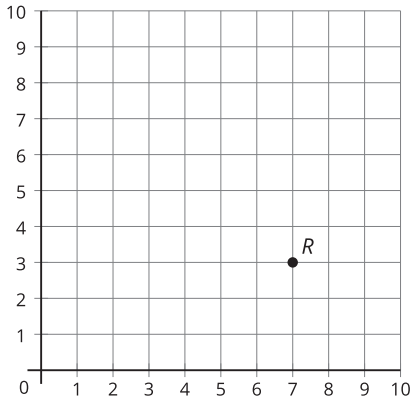
Section C: The Size of a Product

- Lesson 16: Compare Products
- Lesson 17: Interpret Diagrams
- Lesson 18: Compare without Multiplying
- Lesson 19: Compare to 1
- Lesson 20: Will It Always Work?
- Lesson 21: Weekend Investigation

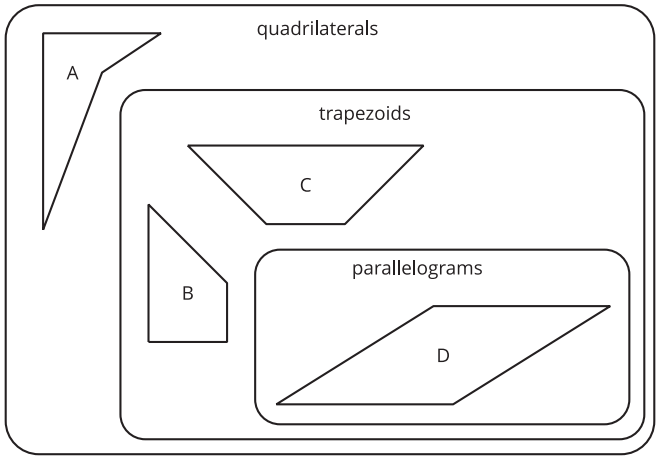
Unit 7: Shapes on the Coordinate Grid

In this unit, students learn about the coordinate grid, deepen their knowledge of two-dimensional shapes, and use the coordinate grid to study relationships of pairs of numbers in various situations.

Students learn about grids that are numbered in two directions. They see that the structure of a coordinate grid allows us to precisely communicate the location of points and shapes.



Students also continue to study two-dimensional shapes and their attributes. In IM Grade 3, they classified triangles and quadrilaterals by the presence of right angles and sides of equal length. In IM Grade 4, they learned about angles and parallel and perpendicular lines, which allowed students to further distinguish shapes. In this unit, students use these insights to make sense of the hierarchy of shapes.



Later in the unit, students analyze and generate numerical patterns based on pairs of rules and graph pairs of numbers on the coordinate grid. They also interpret points on the coordinate grid in terms of situations, plot points to better

understand the relationship between two sets of numbers, and use the coordinate grid to solve problems.

Section A: The Coordinate Grid

- Lesson 1: Explore the Coordinate Grid
- Lesson 2: Points on the Coordinate Grid
- Lesson 3: Plot More Points

Section B: The Hierarchy of Shapes

- Lesson 4: Sort Quadrilaterals
- Lesson 5: Trapezoids
- Lesson 6: Hierarchy of Quadrilaterals
- Lesson 7: Rectangles and Squares
- Lesson 8: Sort Triangles

Section C: Numerical Patterns

- Lesson 9: Generate Patterns
- Lesson 10: Interpret Relationships
- Lesson 11: Patterns and Ordered Pairs
- Lesson 12: Represent Problems on the Coordinate Grid
- Lesson 13: Perimeter and Area of Rectangles
- Lesson 14: Copies of Figures

Unit 8: Putting It All Together

In this unit, students revisit major work and fluency goals of the grade, applying their learning from the year.

In Section A, students deepen their understanding of the standard algorithm for multiplication and practice using it to find the value of products. They also revisit algorithms that use partial quotients to divide whole numbers. In Section B, students solve real-world problems about volume and have opportunities to model with mathematics.

The base of the Great Pyramid of Giza is a square.
Each side of the base is 230 meters long.
The pyramid is now 137 meters tall.

If the pyramid was shaped like a rectangular prism,
what would be the volume of the prism?

Section C focuses on operations with decimals and fractions. In the final section, students review major work of the grade as they create activities in the format of the warm-up routines they have encountered throughout the year (*Notice and Wonder, Estimation Exploration, Number Talk, True or False?* and *Which Three Go Together?*).

The sections in this unit are standalone sections, not required to be completed in order. Within a section, lessons can also be completed selectively and without completing prior lessons. The goal is to offer ample opportunities for students to integrate the knowledge they have gained and to practice skills related to the expected fluencies of the grade.

Section A: Multiply and Divide Whole Numbers

- Lesson 1: Find the Greatest Product
- Lesson 2: More Multiplication
- Lesson 3: Factors as a Factor in Our Strategy Choice
- Lesson 4: Dive Back into Division
- Lesson 5: More Division

Section B: Apply Volume Concepts

- Lesson 6: Revisit Volume
- Lesson 7: Estimate the Volume of the World's Largest Wagon
- Lesson 8: Fill the World's Largest Wagon
- Lesson 9: Problem Solving with Volume: Water

Section C: Fraction and Decimal Operations

- Lesson 10: Here Comes the Sum
- Lesson 11: What's the Difference?
- Lesson 12: Decimal Game Day
- Lesson 13: Multiply Fractions Game Day

Section D: Creation and Design

- Lesson 14: Notice and Wonder
- Lesson 15: Estimation Exploration
- Lesson 16: Number Talk
- Lesson 17: True or False?
- Lesson 18: Which Three Go Together?

Pacing Guide

The number of days includes two assessment days per unit. The upper bound of the range includes optional lessons.

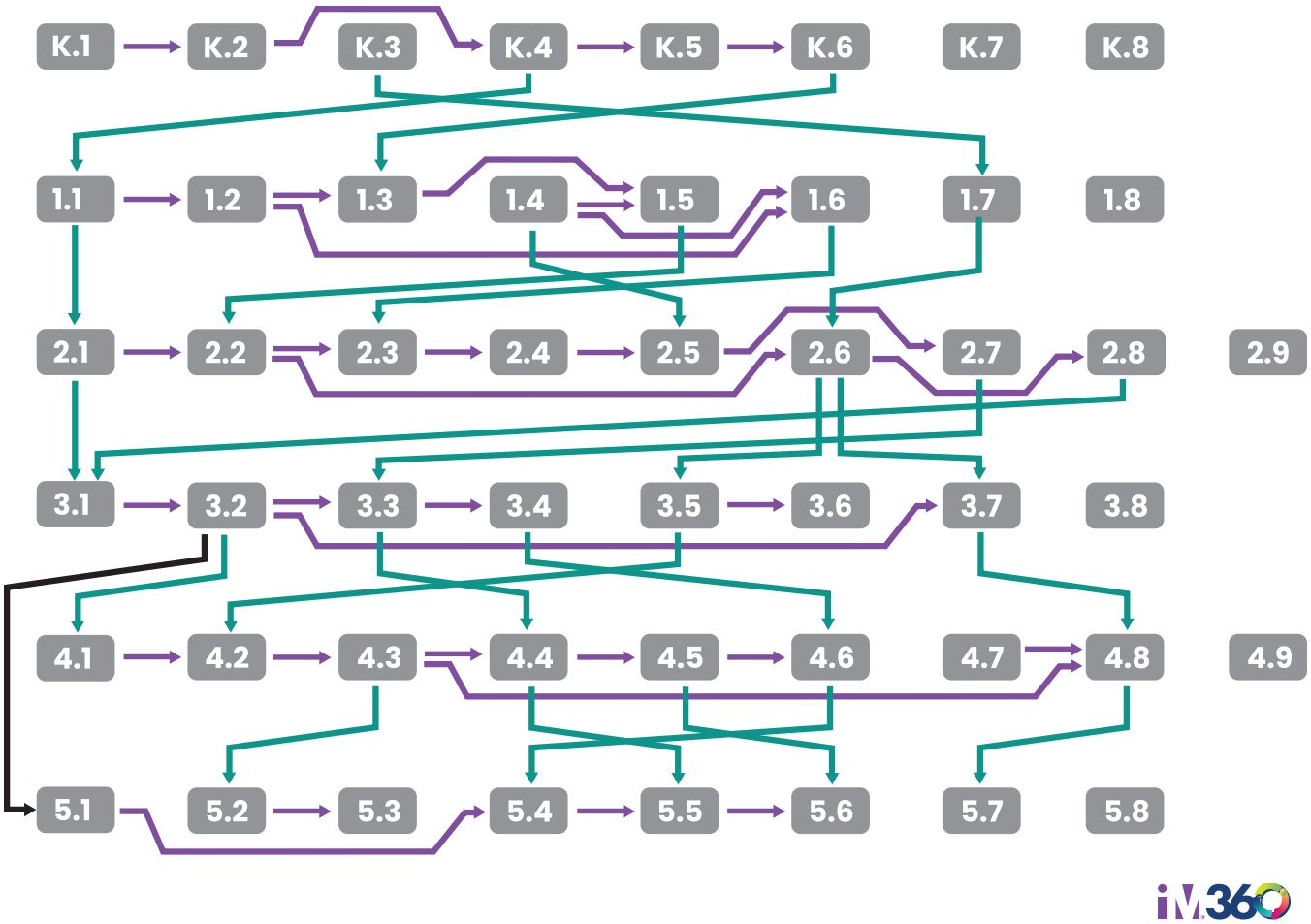
CC BY NC 2024
Illustrative Mathematics®

	Kindergarten	Grade 1	Grade 2
week 1 week 2 week 3 week 4	Unit 1 Math in Our World (18–19 days) Optional Lesson: 17	Unit 1 Adding, Subtracting, and Working with Data (16–17 days) Optional Lesson: 15	Unit 1 Adding, Subtracting, and Working with Data (16–20 days) Optional Lessons: 6, 12, 17, 18
week 5 week 6 week 7 week 8	Unit 2 Numbers 1–10 (23–26 days) Optional Lessons:7, 8, 24	Unit 2 Addition and Subtraction Story Problems (24–25 days) Optional Lesson: 23	Unit 2 Adding and Subtracting within 100 (15–19 days) Optional Lessons: 4, 10, 16, 17
week 9 week 10 week 11 week 12 week 13	Unit 3 Flat Shapes All Around Us (16–17 days) Optional Lesson: 15	Unit 3 Adding and Subtracting within 20 (29–30 days) Optional Lesson: 28	Unit 3 Measuring Length (16–20 days) Optional Lessons: 7, 13, 17, 18
week 14 week 15 week 16 week 17	Unit 4 Understanding Addition and Subtraction (18–20 days) Optional Lessons: 13, 18	Unit 4 Numbers to 99 (23–25 days) Optional Lessons: 12, 23	Unit 4 Addition and Subtraction on the Number Line (14–17 days) Optional Lessons: 6, 14, 15
week 18 week 19 week 20 week 21	Unit 5 Composing and Decomposing Numbers to 10 (15–17 days) Optional Lessons: 4, 15	Unit 5 Adding within 100 (15–16 days) Optional Lesson: 14	Unit 5 Numbers to 1,000 (13–16 days) Optional Lessons: 7, 13, 14
week 22 week 23 week 24	Unit 6 Numbers 0-20 (13–15 days) Optional Lessons: 2, 13	Unit 6 Length Measurements within 120 Units (18–19 days) Optional Lesson: 17	Unit 6 Geometry, Time, and Money (19–24 days) Optional Lessons: 5, 10, 14, 21, 22
week 25 week 26 week 27 week 28	Unit 7 Solid Shapes All Around Us (17-18 days) Optional Lesson: 16	Unit 7 Geometry and Time (19-20 days) Optional Lesson: 18	Unit 7 Adding and Subtracting within 1,000 (16–21 days) Optional Lessons: 5, 11, 17, 18, 19
week 29 week 30 week 31 week 32 week 33 week 34	Unit 8 Putting It All Together (17–23 days) Optional Lessons: 2, 4, 5, 17, 18, 19	Unit 8 Putting It All Together (12 days) Optional Lessons: none	Unit 8 Equal Groups (12–16 days) Optional Lessons: 5, 6, 13, 14 Unit 9 Putting It All Together (15 days) Optional Lessons: none

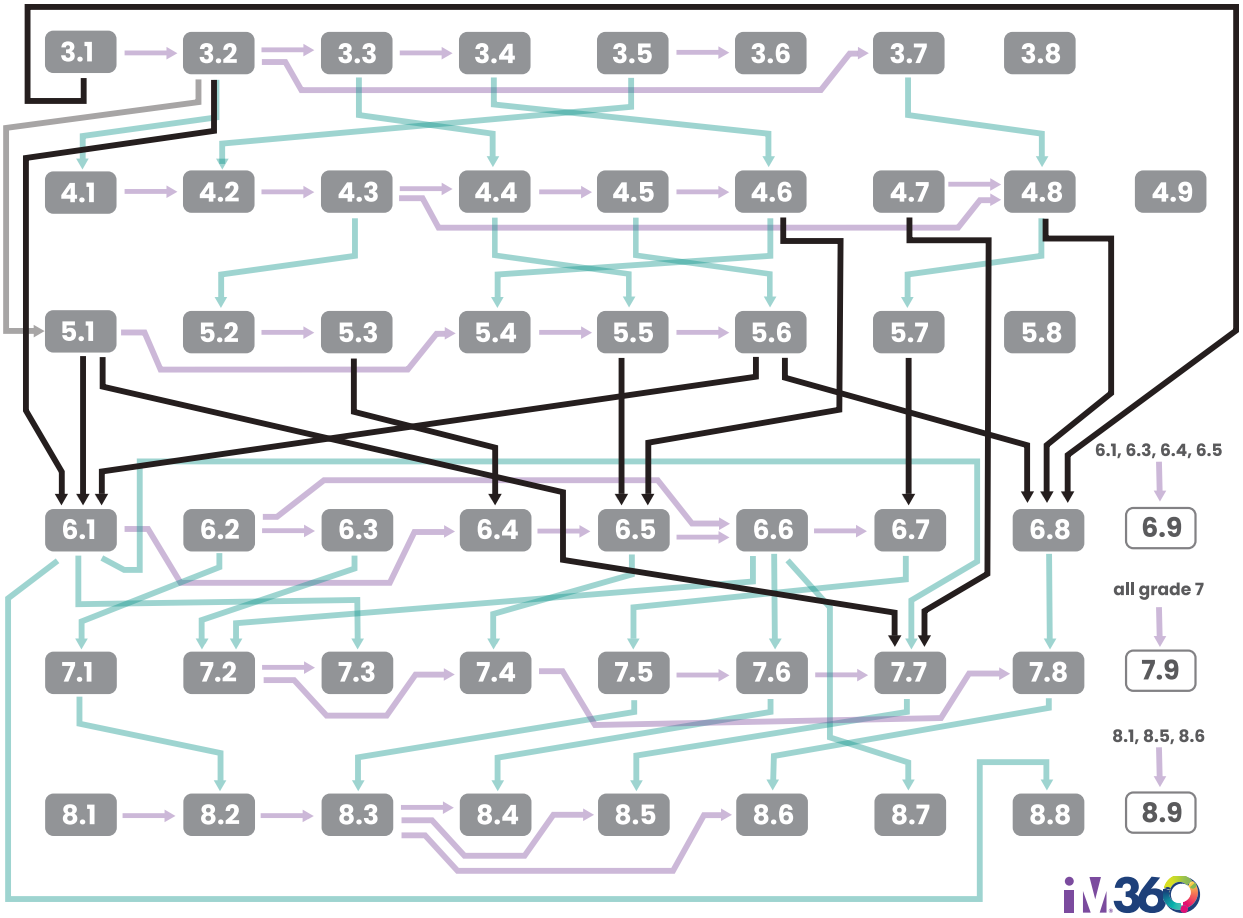
	Grade 3	Grade 4	Grade 5
week 1	Unit 1 Introducing Multiplication (22–23 days) Optional Lesson: 21	Unit 1 Factors and Multiples (8–10 days) Optional Lessons: 4, 8	Unit 1 Finding Volume (13–14 days) Optional Lesson: 12
week 2			
week 3		Unit 2 Fraction Equivalence and Comparison (18–19 days) Optional Lesson: 17	
week 4			Unit 2 Fractions as Quotients and Fraction Multiplication (17–19 days) Optional Lessons: 16, 17
week 5			
week 6	Unit 2 Area and Multiplication (16–17 days) Optional Lessons: 15		
week 7		Unit 3 Extending Operations to Fractions (20–22 days) Optional Lessons: 19, 20	
week 8			Unit 3 Multiplying and Dividing Fractions (20–22 days) Optional Lessons: 10, 20
week 9	Unit 3 Wrapping Up Addition and Subtraction within 1,000 (22–23 days) Optional Lesson: 21		
week 10			
week 11		Unit 4 From Hundredths to Hundred-thousands (24–25 days) Optional Lesson: 23	
week 12			Unit 4 Wrapping Up Multiplication and Division with Multi-Digit Numbers (20–22 days) Optional Lessons: 16, 20
week 13			
week 14	Unit 4 Relating Multiplication to Division (23–24 days) Optional Lesson: 22		
week 15			
week 16		Unit 5 Multiplicative Comparison and Measurement (19-20 days) Optional Lesson: 18	
week 17			Unit 5 Place Value Patterns and Decimal Operations (26–28 days) Optional Lessons: 4, 26
week 18			
week 19	Unit 5 Fractions as Numbers (19–20 days) Optional Lesson: 18		
week 20		Unit 6 Multiplying and Dividing Multi-digit Numbers (27–28 days) Optional Lesson: 26	
week 21			
week 22			
week 23	Unit 6 Measuring Length, Time, Liquid Volume, and Weight (17–18 days) Optional Lesson: 16		Unit 6 More Decimal and Fraction Operations (21–23 days) Optional Lessons: 20, 21
week 24			
week 25		Unit 7 Angles and Angle Measurement (17–18 days) Optional Lesson: 16	
week 26			
week 27	Unit 7 Two-dimensional Shapes and Perimeter (16 - 17 days) Optional Lesson: 15		Unit 7 Shapes on the Coordinate Plane (15 -16 days) Optional Lesson: 14
week 28			
week 29		Unit 8 Properties of Two-dimensional Shapes (9–13 days) Optional Lessons: 6, 9, 10, 11	
week 30			
week 31	Unit 8 Putting It All Together (17 days) Optional Lessons: none		Unit 8 Putting It All Together (19–20 days) Optional Lesson: 9
week 32		Unit 9 Putting It All Together (14 days) Optional Lessons: none	
week 33			
week 34			

Dependency Chart

In the unit dependency chart, an arrow indicates that a particular unit is designed for students who already know the material in a previous unit. Reversing the order of the units would have a negative effect on mathematical or pedagogical coherence.

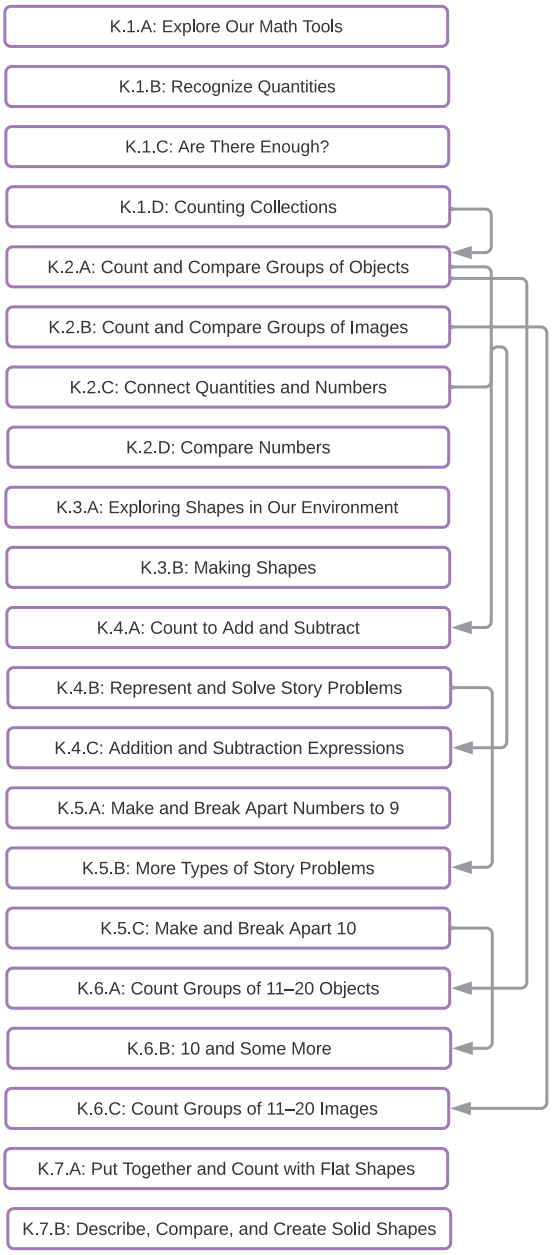


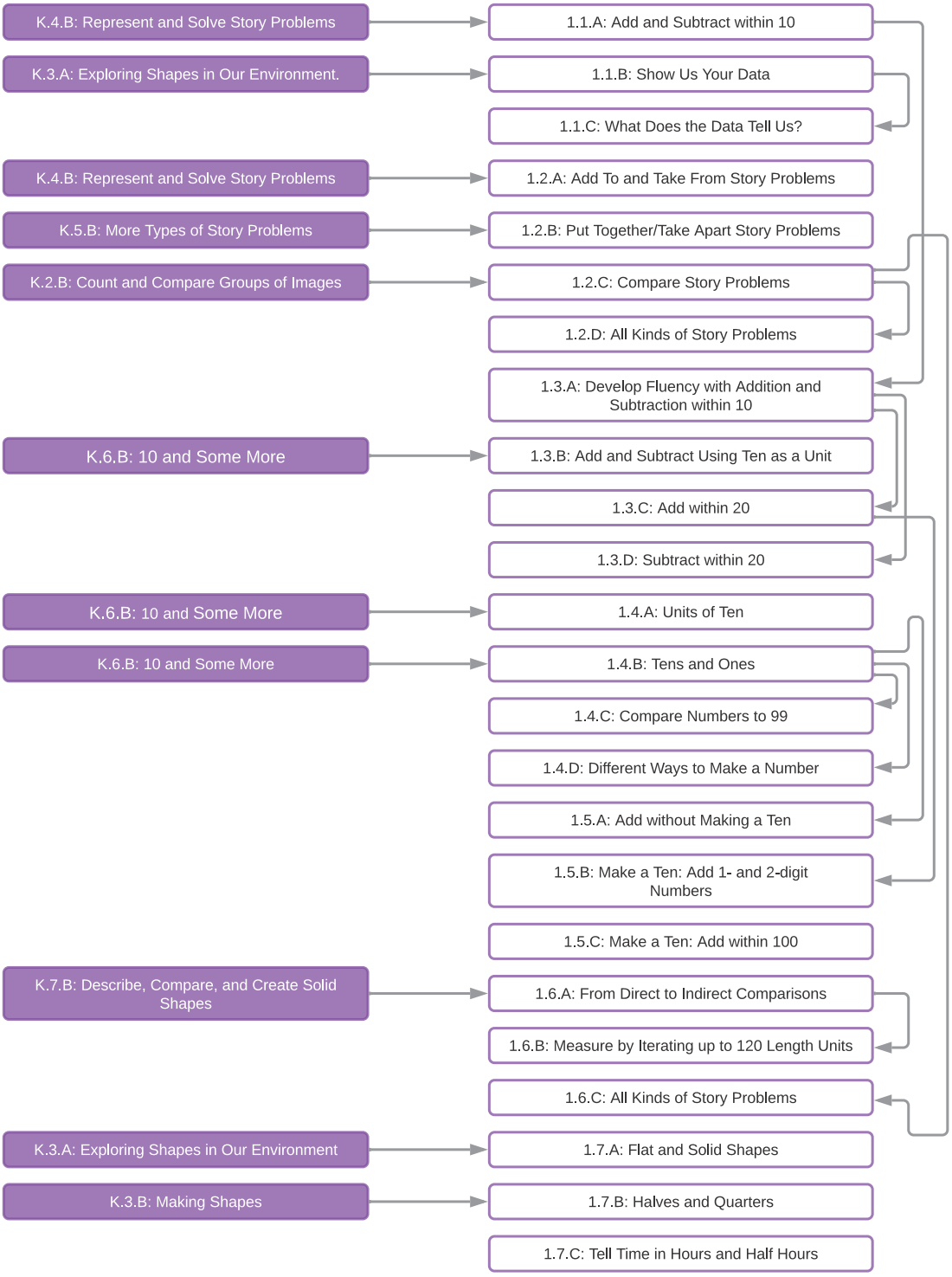
The following chart shows unit dependencies across the curriculum for IM Grades 3–8.

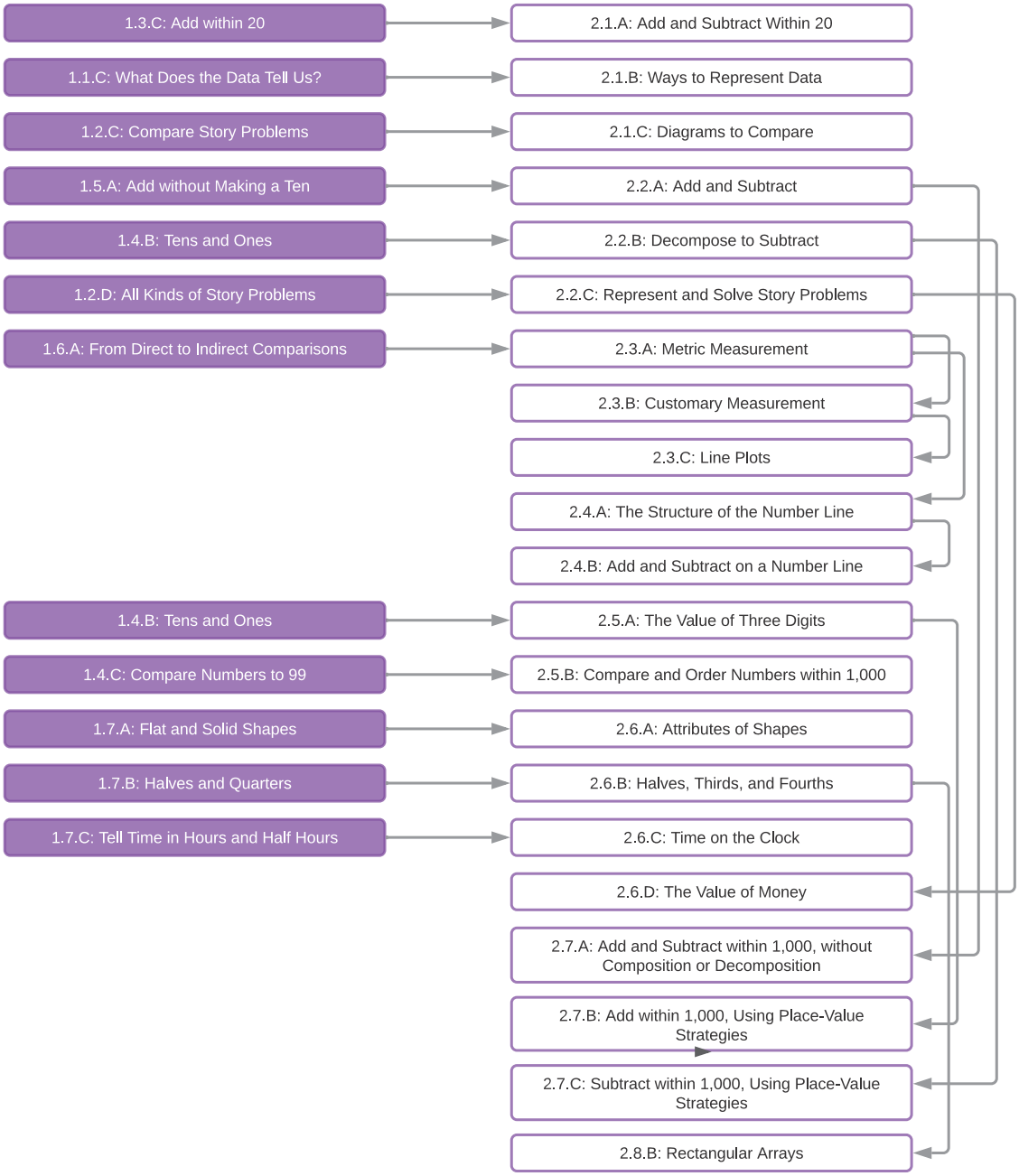


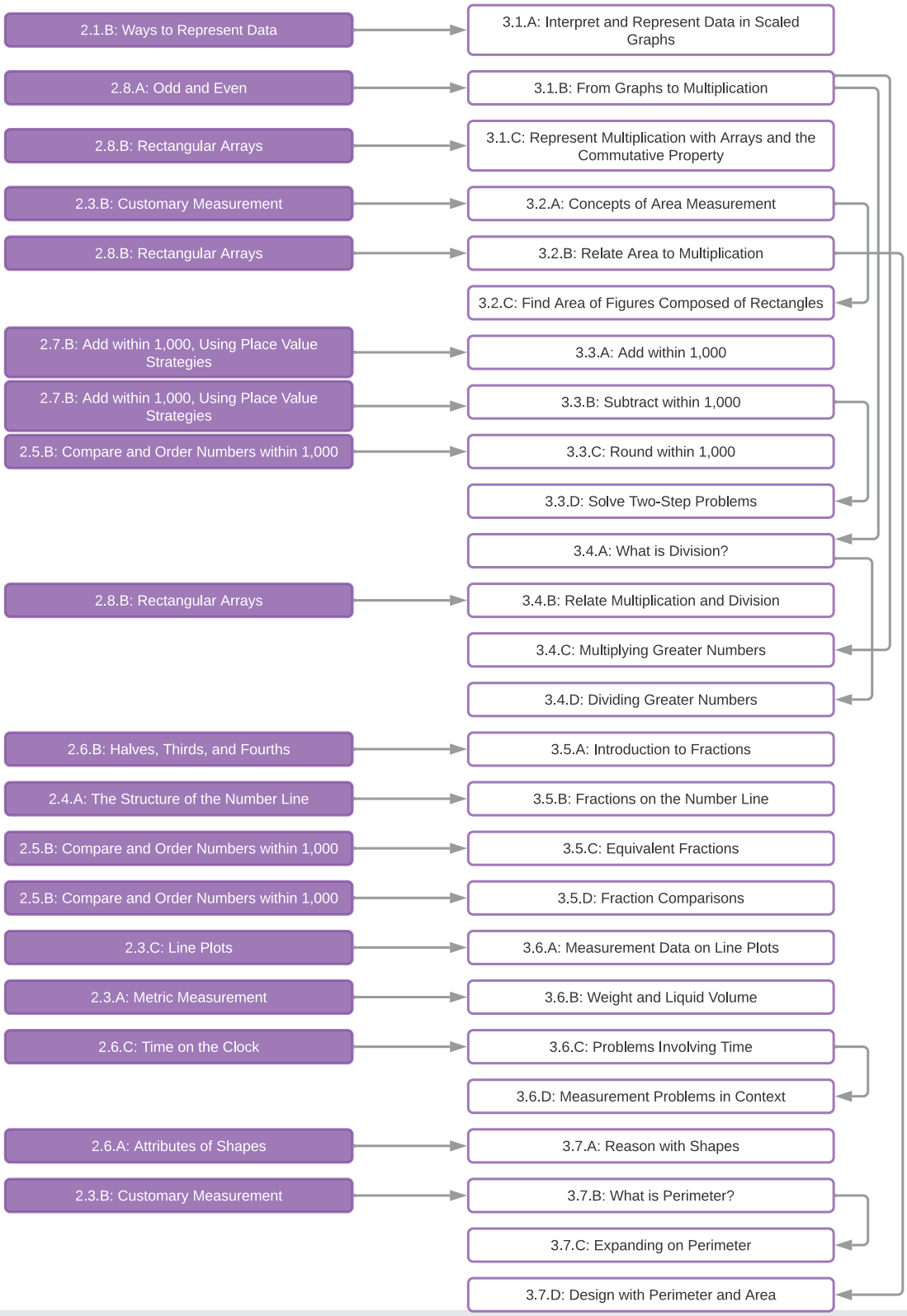
Section Dependency Diagrams

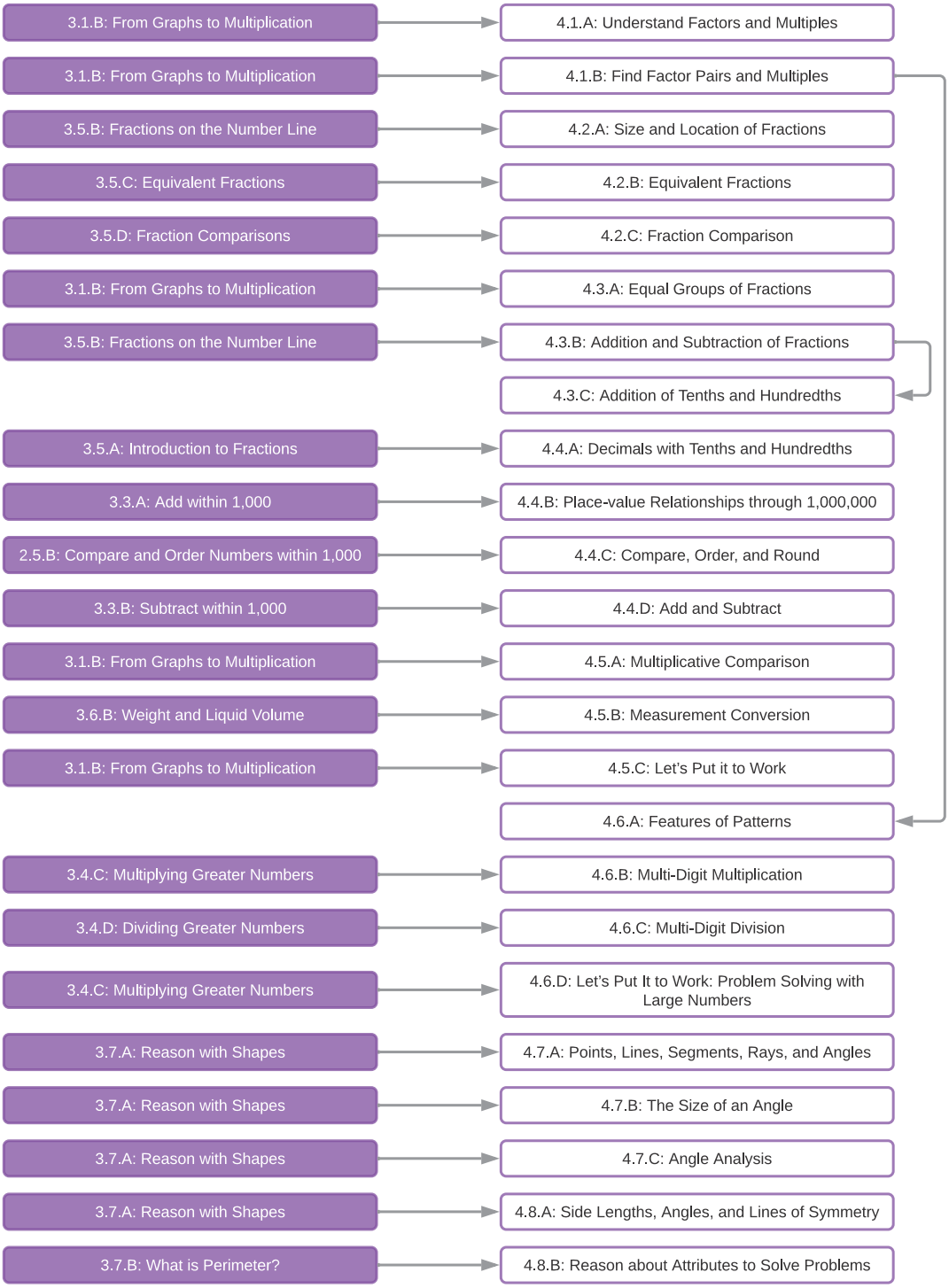
In the section dependency charts, an arrow indicates the prior section that contains content most directly designed to support or build toward the content in the current section.

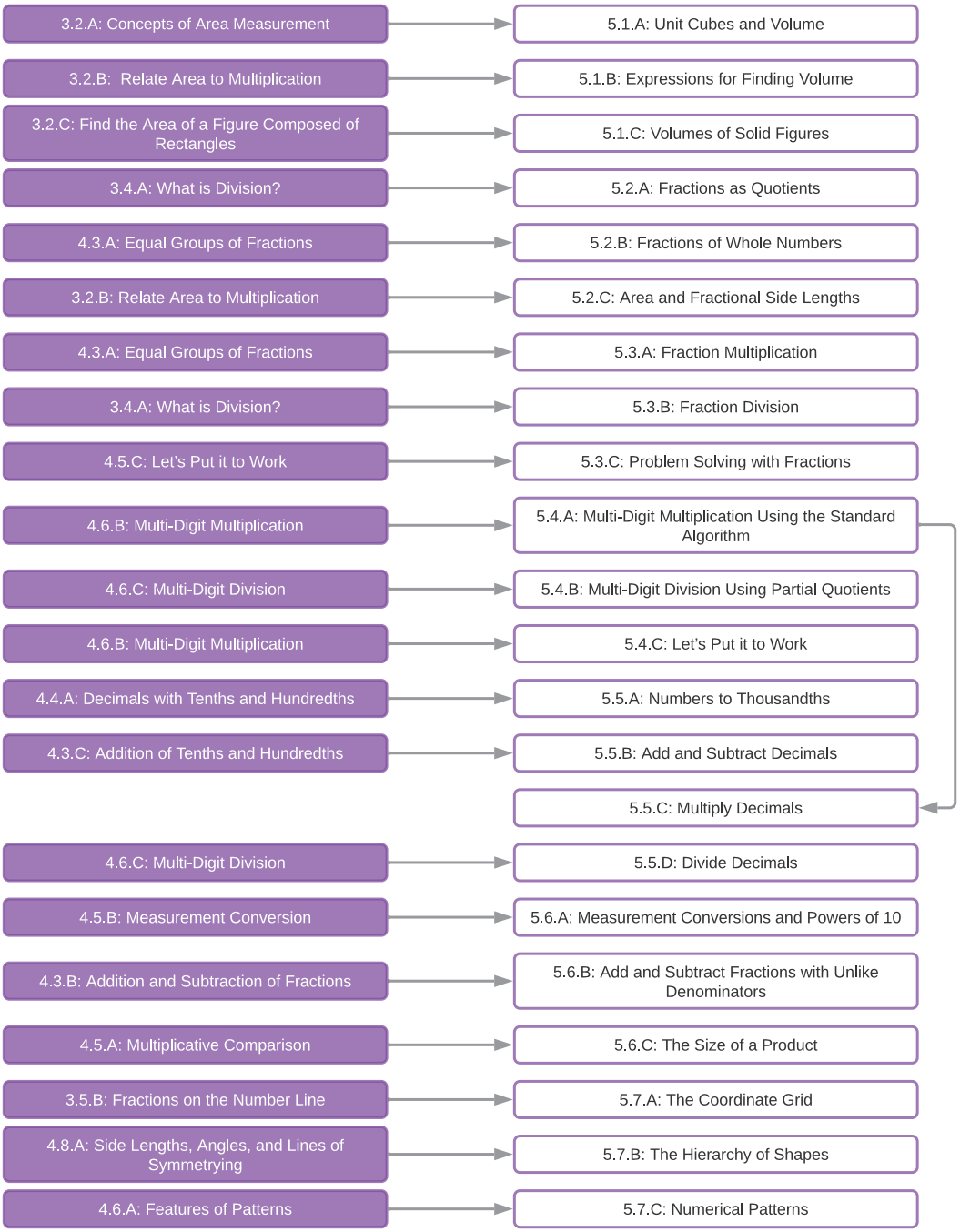

K.1.A: Explore Our Math Tools
K.1.B: Recognize Quantities
K.1.C: Are There Enough?
K.1.D: Counting Collections
K.2.A: Count and Compare Groups of Objects
K.2.B: Count and Compare Groups of Images
K.2.C: Connect Quantities and Numbers
K.2.D: Compare Numbers
K.3.A: Exploring Shapes in Our Environment
K.3.B: Making Shapes
K.4.A: Count to Add and Subtract
K.4.B: Represent and Solve Story Problems
K.4.C: Addition and Subtraction Expressions
K.5.A: Make and Break Apart Numbers to 9
K.5.B: More Types of Story Problems
K.5.C: Make and Break Apart 10
K.6.A: Count Groups of 11–20 Objects
K.6.B: 10 and Some More
K.6.C: Count Groups of 11–20 Images
K.7.A: Put Together and Count with Flat Shapes
K.7.B: Describe, Compare, and Create Solid Shapes


K.4.B: Represent and Solve Story Problems
K.3.A: Exploring Shapes in Our Environment.
K.4.B: Represent and Solve Story Problems
K.5.B: More Types of Story Problems
K.2.B: Count and Compare Groups of Images
K.6.B: 10 and Some More
K.6.B: 10 and Some More
K.6.B: 10 and Some More
K.7.B: Describe, Compare, and Create Solid Shapes
K.3.A: Exploring Shapes in Our Environment
K.3.B: Making Shapes
1.1.A: Add and Subtract within 10
1.1.B: Show Us Your Data
1.1.C: What Does the Data Tell Us?
1.2.A: Add To and Take From Story Problems
1.2.B: Put Together/Take Apart Story Problems
1.2.C: Compare Story Problems
1.2.D: All Kinds of Story Problems
1.3.A: Develop Fluency with Addition and Subtraction within 10
1.3.B: Add and Subtract Using Ten as a Unit
1.3.C: Add within 20
1.3.D: Subtract within 20
1.4.A: Units of Ten
1.4.B: Tens and Ones
1.4.C: Compare Numbers to 99
1.4.D: Different Ways to Make a Number
1.5.A: Add without Making a Ten
1.5.B: Make a Ten: Add 1- and 2-digit Numbers
1.5.C: Make a Ten: Add within 100
1.6.A: From Direct to Indirect Comparisons
1.6.B: Measure by Iterating up to 120 Length Units
1.6.C: All Kinds of Story Problems
1.7.A: Flat and Solid Shapes
1.7.B: Halves and Quarters
1.7.C: Tell Time in Hours and Half Hours


1.3.C: Add within 20
1.1.C: What Does the Data Tell Us?
1.2.C: Compare Story Problems
1.5.A: Add without Making a Ten
1.4.B: Tens and Ones
1.2.D: All Kinds of Story Problems
1.6.A: From Direct to Indirect Comparisons
1.4.B: Tens and Ones
1.4.C: Compare Numbers to 99
1.7.A: Flat and Solid Shapes
1.7.B: Halves and Quarters
1.7.C: Tell Time in Hours and Half Hours
2.1.A: Add and Subtract Within 20
2.1.B: Ways to Represent Data
2.1.C: Diagrams to Compare
2.2.A: Add and Subtract
2.2.B: Decompose to Subtract
2.2.C: Represent and Solve Story Problems
2.3.A: Metric Measurement
2.3.B: Customary Measurement
2.3.C: Line Plots
2.4.A: The Structure of the Number Line
2.4.B: Add and Subtract on a Number Line
2.5.A: The Value of Three Digits
2.5.B: Compare and Order Numbers within 1,000
2.6.A: Attributes of Shapes
2.6.B: Halves, Thirds, and Fourths
2.6.C: Time on the Clock
2.6.D: The Value of Money
2.7.A: Add and Subtract within 1,000, without Composition or Decomposition
2.7.B: Add within 1,000, Using Place-Value Strategies
2.7.C: Subtract within 1,000, Using Place-Value Strategies
2.8.B: Rectangular Arrays


2.1.B: Ways to Represent Data
3.1.A: Interpret and Represent Data in Scaled Graphs
2.8.A: Odd and Even
3.1.B: From Graphs to Multiplication
2.8.B: Rectangular Arrays
3.1.C: Represent Multiplication with Arrays and the Commutative Property
2.3.B: Customary Measurement
3.2.A: Concepts of Area Measurement
2.8.B: Rectangular Arrays
3.2.B: Relate Area to Multiplication
3.2.C: Find Area of Figures Composed of Rectangles
2.7.B: Add within 1,000, Using Place Value Strategies
3.3.A: Add within 1,000
2.7.B: Add within 1,000, Using Place Value Strategies
3.3.B: Subtract within 1,000
2.5.B: Compare and Order Numbers within 1,000
3.3.C: Round within 1,000
3.3.D: Solve Two-Step Problems
3.4.A: What is Division?
2.8.B: Rectangular Arrays
3.4.B: Relate Multiplication and Division
3.4.C: Multiplying Greater Numbers
3.4.D: Dividing Greater Numbers
2.6.B: Halves, Thirds, and Fourths
3.5.A: Introduction to Fractions
2.4.A: The Structure of the Number Line
3.5.B: Fractions on the Number Line
2.5.B: Compare and Order Numbers within 1,000
3.5.C: Equivalent Fractions
2.5.B: Compare and Order Numbers within 1,000
3.5.D: Fraction Comparisons
2.3.C: Line Plots
3.6.A: Measurement Data on Line Plots
2.3.A: Metric Measurement
3.6.B: Weight and Liquid Volume
2.6.C: Time on the Clock
3.6.C: Problems Involving Time
3.6.D: Measurement Problems in Context
2.6.A: Attributes of Shapes
3.7.A: Reason with Shapes
2.3.B: Customary Measurement
3.7.B: What is Perimeter?
3.7.C: Expanding on Perimeter
3.7.D: Design with Perimeter and Area


3.1.B: From Graphs to Multiplication
4.1.A: Understand Factors and Multiples
3.1.B: From Graphs to Multiplication
4.1.B: Find Factor Pairs and Multiples
3.5.B: Fractions on the Number Line
4.2.A: Size and Location of Fractions
3.5.C: Equivalent Fractions
4.2.B: Equivalent Fractions
3.5.D: Fraction Comparisons
4.2.C: Fraction Comparison
3.1.B: From Graphs to Multiplication
4.3.A: Equal Groups of Fractions
3.5.B: Fractions on the Number Line
4.3.B: Addition and Subtraction of Fractions
4.3.C: Addition of Tenths and Hundredths
3.5.A: Introduction to Fractions
4.4.A: Decimals with Tenths and Hundredths
3.3.A: Add within 1,000
4.4.B: Place-value Relationships through 1,000,000
2.5.B: Compare and Order Numbers within 1,000
4.4.C: Compare, Order, and Round
3.3.B: Subtract within 1,000
4.4.D: Add and Subtract
3.1.B: From Graphs to Multiplication
4.5.A: Multiplicative Comparison
3.6.B: Weight and Liquid Volume
4.5.B: Measurement Conversion
3.1.B: From Graphs to Multiplication
4.5.C: Let's Put it to Work
4.6.A: Features of Patterns
3.4.C: Multiplying Greater Numbers
4.6.B: Multi-Digit Multiplication
3.4.D: Dividing Greater Numbers
4.6.C: Multi-Digit Division
3.4.C: Multiplying Greater Numbers
4.6.D: Let's Put It to Work: Problem Solving with Large Numbers
3.7.A: Reason with Shapes
4.7.A: Points, Lines, Segments, Rays, and Angles
3.7.A: Reason with Shapes
4.7.B: The Size of an Angle
3.7.A: Reason with Shapes
4.7.C: Angle Analysis
3.7.A: Reason with Shapes
4.8.A: Side Lengths, Angles, and Lines of Symmetry
3.7.B: What is Perimeter?
4.8.B: Reason about Attributes to Solve Problems


3.2.A: Concepts of Area Measurement
5.1.A: Unit Cubes and Volume
3.2.B: Relate Area to Multiplication
5.1.B: Expressions for Finding Volume
3.2.C: Find the Area of a Figure Composed of Rectangles
5.1.C: Volumes of Solid Figures
3.4.A: What is Division?
5.2.A: Fractions as Quotients
4.3.A: Equal Groups of Fractions
5.2.B: Fractions of Whole Numbers
3.2.B: Relate Area to Multiplication
5.2.C: Area and Fractional Side Lengths
4.3.A: Equal Groups of Fractions
5.3.A: Fraction Multiplication
3.4.A: What is Division?
5.3.B: Fraction Division
4.5.C: Let's Put it to Work
5.3.C: Problem Solving with Fractions
4.6.B: Multi-Digit Multiplication
5.4.A: Multi-Digit Multiplication Using the Standard Algorithm
4.6.C: Multi-Digit Division
5.4.B: Multi-Digit Division Using Partial Quotients
4.6.B: Multi-Digit Multiplication
5.4.C: Let's Put it to Work
4.4.A: Decimals with Tenths and Hundredths
5.5.A: Numbers to Thousandths
4.3.C: Addition of Tenths and Hundredths
5.5.B: Add and Subtract Decimals
5.5.C: Multiply Decimals
4.6.C: Multi-Digit Division
5.5.D: Divide Decimals
4.5.B: Measurement Conversion
5.6.A: Measurement Conversions and Powers of 10
4.3.B: Addition and Subtraction of Fractions
5.6.B: Add and Subtract Fractions with Unlike Denominators
4.5.A: Multiplicative Comparison
5.6.C: The Size of a Product
3.5.B: Fractions on the Number Line
5.7.A: The Coordinate Grid
4.8.A: Side Lengths, Angles, and Lines of Symmetrying
5.7.B: The Hierarchy of Shapes
4.6.A: Features of Patterns
5.7.C: Numerical Patterns