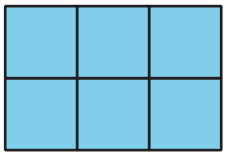
Scope and Sequence for Grade 4

The big ideas in IM Grade 4 include: developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; understanding that geometric figures can be analyzed and classified, based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Unit 1: Factors and Multiples

In this unit, students extend their knowledge of multiplication, division, and the area of a rectangle to deepen their understanding of factors and to learn about multiples.

In grade 3, students learned that they can multiply the two side lengths of a rectangle to find its area, and divide the area by one side length to find the other side length.



To represent these ideas, students used area diagrams, wrote expressions and equations, and learned the terms "factors" and "products."

In this unit, students return to the concept of area to make sense of factors and multiples of numbers. Students find as many pairs of whole-number side lengths as they can given a rectangle with a specific area. They make sense of those side lengths as factor pairs of the whole-number area, and the area as a multiple of each side length.

Students also learn that a number can be classified as prime or composite based on the number of factor pairs it has.

Throughout the unit, students encounter various contexts related to school, gatherings, and celebrations. They are intended to invite conversations about students' lives and experiences. Consider them as opportunities to learn about students as individuals, to foster a positive learning community, and to shape each lesson based on insights about students.

Section A: Understand Factors and Multiples

- Lesson 1: Multiples of a Number
- Lesson 2: Factor Pairs
- Lesson 3: Prime and Composite Numbers
- Lesson 4: Multiplication Practice

Section B: Find Factor Pairs and Multiples

- Lesson 5: More Multiples
- Lesson 6: The Locker Problem
- Lesson 7: Find Factors and Multiples
- Lesson 8: Mondrian's Art

Unit 2: Fraction Equivalence and Comparison

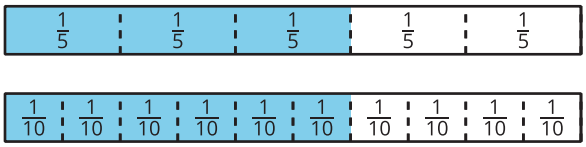
In this unit, students extend their prior understanding of equivalent fractions and comparison of fractions.

In grade 3, students partitioned shapes into parts with equal area and expressed the area of each part as a unit fraction. They learned that any unit fraction $\frac{1}{b}$ results from a 1 partitioned into b equal parts. Students used unit fractions to build non-unit fractions, including fractions greater than 1, and represented them on fraction strips and tape diagrams. The denominators of these fractions were limited to 2, 3, 4, 6, and 8. Students also worked with fractions on a number

line, establishing the idea of fractions as numbers and equivalent fractions as the same point on the number line.

Here, students follow a similar progression of representations. They use fraction strips, tape diagrams, and number lines to make sense of the size of fractions, generate equivalent fractions, and compare and order fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

Students generalize that a fraction $\frac{a}{b}$ is equivalent to fraction $\frac{(n \times a)}{(n \times b)}$ because each unit fraction is being broken into n times as many equal parts, making the size of the part n times as small $\frac{1}{(n \times b)}$ and the number of parts in the whole n times as many $(n \times a)$. For example, we can see $\frac{3}{5}$ is equivalent to $\frac{6}{10}$ because when each fifth is partitioned into 2 parts, there are 2×3 or 6 shaded parts, twice as many as before, and the size of each part is half as small, $\frac{1}{(2 \times 5)}$ or $\frac{1}{10}$.



As the unit progresses, students use equivalent fractions and benchmarks, such as $\frac{1}{2}$ and 1, to reason about the relative location of fractions on a number line and to compare and order fractions.

Section A: Size and Location of Fractions

- Lesson 1: Representations of Fractions (Part 1)
- Lesson 2: Representations of Fractions (Part 2)
- Lesson 3: Same Denominator or Numerator
- Lesson 4: Same Size, Related Sizes
- Lesson 5: Fractions on Number Lines
- Lesson 6: Relate Fractions to Benchmarks

Section B: Equivalent Fractions

- Lesson 7: Equivalent Fractions
- Lesson 8: Equivalent Fractions on the Number Line
- Lesson 9: Explain Equivalence
- Lesson 10: Use Multiples to Find Equivalent Fractions
- Lesson 11: Use Factors to Find Equivalent Fractions

Section C: Fraction Comparison

- Lesson 12: Ways to Compare Fractions
- Lesson 13: Use Equivalent Fractions to Compare
- Lesson 14: Fraction Comparison Problems
- Lesson 15: Use Common Denominators to Compare
- Lesson 16: Compare and Order Fractions
- Lesson 17: Paper Clip Games

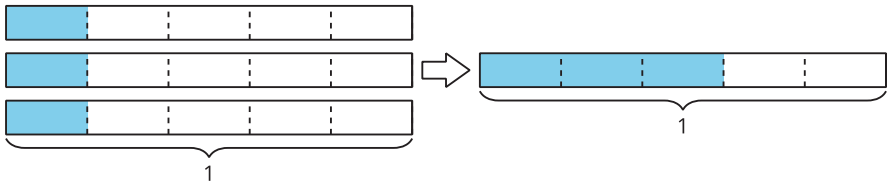
Unit 3: Extending Operations to Fractions

In this unit, students deepen their understanding of how fractions can be composed and decomposed, and they learn about operations on fractions.

In grade 3, students partitioned a whole into equal parts and identified one of the parts as a unit fraction. They learned that non-unit fractions and whole numbers are composed of unit fractions. They used visual fraction models, including tape diagrams and number lines, to represent and compare fractions. In a previous unit, students extended that work and reasoned about fraction equivalence.

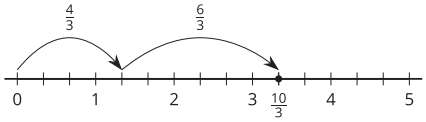
Here students multiply fractions by whole numbers, add and subtract fractions with the same denominator, and add tenths and hundredths. They rely on familiar concepts and representations to do so. For instance, students had represented multiplication on a tape diagram, with equal-size groups and a whole number in each group. Here they use a tape diagram that shows a fraction in each group.

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

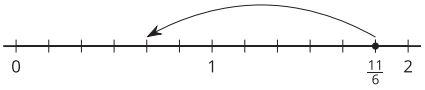


In earlier grades, students used number lines to represent addition and subtraction of whole numbers. Here, they use number lines to represent the decomposition of fractions into sums, and to reason about addition and subtraction of fractions with the same denominator, including mixed numbers.

$$\frac{4}{3} + \frac{6}{3} = \frac{10}{3}$$



$$\frac{11}{6} - \frac{7}{6} = \frac{4}{6}$$



Students then apply these skills in the context of measurement and data. They analyze line plots showing fractional lengths and find sums and differences to answer questions about the data.

Lastly students use fraction equivalence to find sums of tenths and hundredths. For instance, to find $\frac{3}{10} + \frac{15}{100}$, they reason that $\frac{3}{10}$ is equivalent to $\frac{30}{100}$, so the sum is $\frac{30}{100} + \frac{15}{100}$, which is $\frac{45}{100}$.

Section A: Equal Groups of Fractions

- Lesson 1: Equal Groups of Unit Fractions
- Lesson 2: Representations of Equal Groups of Fractions
- Lesson 3: Patterns in Multiplication
- Lesson 4: Equal Groups of Non-unit Fractions
- Lesson 5: Equivalent Multiplication Expressions
- Lesson 6: Problems with Equal Groups of Fractions

Section B: Addition and Subtraction of Fractions

- Lesson 7: Fractions as Sums
- Lesson 8: Addition of Fractions

- Lesson 9: Differences of Fractions
- Lesson 10: The Numbers in Subtraction
- Lesson 11: Subtract Fractions Flexibly
- Lesson 12: Sums and Differences of Fractions
- Lesson 13: Fractional Measurements on Line Plots
- Lesson 14: Problems about Fractional Measurement Data

Section C: Addition of Tenths and Hundredths

- Lesson 15: An Assortment of Fractions
- Lesson 16: Add Tenths and Hundredths Together
- Lesson 17: Sums of Tenths and Hundredths
- Lesson 18: A Lot of Fractions to Add
- Lesson 19: Flexible with Fractions
- Lesson 20: Sticky Notes

Unit 4: From Hundredths to Hundred-Thousands

In this unit, students learn to express both small and large numbers in base ten, extending their understanding to include numbers from hundredths to hundred-thousands.

In previous units, students compared, added, subtracted, and wrote equivalent fractions for tenths and hundredths. In this unit, students take a closer look at the relationship between tenths and hundredths and learn to express them in decimal notation. Students analyze and represent fractions on square grids of 100 where the entire grid represents 1. They reason about the size of tenths and hundredths written as decimals, locate decimals on a number line, and compare and order decimals.

Students then explore large numbers. They begin by using base-ten blocks and diagrams to build, read, write, and represent whole numbers beyond 1,000. Students see that ten-thousands are related to thousands in the same way that thousands are related to hundreds, and hundreds are to tens, and tens are to ones.

As they make sense of this structure (MP7), students see that the value of the digit in a place represents ten times the value of the same digit in the place to its right.

Students reason about the size of multi-digit numbers and locate them on number lines. To do so, they need to consider the value of the digits. Students compare, round, and order numbers through 1,000,000. They also use place-value reasoning to add and subtract numbers within 1,000,000 using the standard algorithm.

Throughout the unit, students relate these concepts to real-world contexts and use what they have learned to determine the reasonableness of their responses.

Section A: Decimals with Tenths and Hundredths

- Lesson 1: Decimal Numbers
- Lesson 2: Equivalent Decimals
- Lesson 3: Decimals on Number Lines
- Lesson 4: Compare and Order Decimals
- Lesson 5: Compare and Order Decimals in Different Notations

Section B: Place Value Relationships through 1,000,000

- Lesson 6: How Much Is 10,000?
- Lesson 7: Numbers Within 100,000
- Lesson 8: Beyond 100,000
- Lesson 9: Same Digit, Different Value
- Lesson 10: Ten Times As Much
- Lesson 11: Large Numbers on a Number Line

Section C: Compare, Order, and Round

- Lesson 12: Compare Multi-Digit Numbers
- Lesson 13: Order Multi-Digit Numbers
- Lesson 14: Multiples of 10,000 and 100,000
- Lesson 15: The Nearest Multiples of 1,000, 10,000, and 100,000
- Lesson 16: Round Numbers
- Lesson 17: Apply Rounding

Section D: Add and Subtract

- Lesson 18: Standard Algorithm to Add and Subtract
- Lesson 19: Compose and Decompose to Add and Subtract
- Lesson 20: Add and Subtract within 1,000,000
- Lesson 21: Zeros in the Standard Algorithm
- Lesson 22: Solve Problems Involving Large Numbers
- Lesson 23: Bees are Buzzing

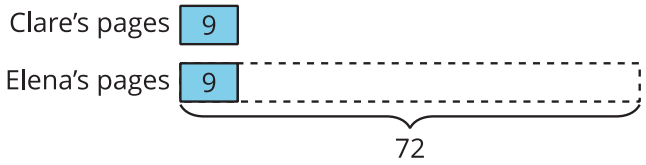
Unit 5: Multiplicative Comparison and Measurement

In this unit, students make sense of multiplication as a way to compare quantities. They use this understanding to solve problems about measurement.

In earlier grades, students related two quantities and made an additive comparison, where the key question was "How many more?" Here they make a multiplicative comparison, in which the underlying question is "How many times as many?" For example, if Mai has 3 cubes and Tyler has 18 cubes, we can say that Tyler has 6 times as many cubes as Mai does.

Initially, students reason, using concrete manipulatives and discrete images. Later, they reason more abstractly, using tape diagrams and equations. Comparative language, such as "_____ times as many (or much) as ____" is emphasized, offering students opportunities to attend to precision as they communicate mathematically (MP6).

Write a multiplication equation to compare the pages read by Elena and Clare. Use a symbol to represent the unknown.



Next, students use the idea and language of multiplicative relationships to learn about various units of length, mass,

capacity, and time, and to convert from larger units to smaller units, within the same system of measurement. For example, they describe 1 kilometer as 1,000 times as long as a meter. Students then use their new knowledge to solve measurement problems.

Elena's disc went 3 times as far as Clare's did.
Andre's disc went 4 times as far as Tyler's did.

How far did Elena and Tyler throw the disc?

student	distance
Han	17 yards
Lin	$51\frac{1}{2}$ feet
Clare	$21\frac{1}{3}$ feet
Andre	22 yards 2 feet
Elena	
Tyler	

Section A: Multiplicative Comparison

- Lesson 1: Times as Many
- Lesson 2: Interpret Representations of Multiplicative Comparison
- Lesson 3: Solve Multiplicative Comparison Problems
- Lesson 4: Solve Multiplicative Comparison Problems with Large Numbers
- Lesson 5: One- and Two-Step Comparison Problems
- Lesson 6: Ten Times as Many

Section B: Measurement Conversion

- Lesson 7: Meters and Centimeters
- Lesson 8: Meters and Kilometers
- Lesson 9: Grams and Kilograms, Liters, and Milliliters
- Lesson 10: Multi-Step Measurement Problems
- Lesson 11: Pounds and Ounces
- Lesson 12: Hours, Minutes, and Seconds
- Lesson 13: Multi-Step Measurement Problems with Fractions

Section C: Let's Put It to Work

- Lesson 14: Weight and Capacity Measurements
- Lesson 15: Length Measurements
- Lesson 16: Compare Perimeters of Rectangles
- Lesson 17: More Perimeter Problems
- Lesson 18: Two Truths and a Lie

Unit 6: Multiplying and Dividing Multi-digit Numbers

In this unit, students extend their knowledge of multiplication and division to find products and quotients of multi-digit numbers.

In IM Grade 3, students learned that they could find the value of a product by decomposing one factor into smaller parts, finding partial products, and then combining them. To support this reasoning, they used base-ten diagrams (decomposing two-digit factors into tens and ones) and area diagrams (decomposing one side length into smaller numbers). In this unit, students use those understandings to multiply up to four digits by single-digit numbers, and to multiply a pair of two-digit numbers.

Students begin by generating geometric and numerical patterns that follow a given rule. Students describe features of the patterns that are not explicit in the rule and use ideas and language related to multiplication and multiplicative relationships (such as factors, multiples, double) to explain what they notice. As they generate and analyze patterns, they deepen their understanding of properties of operations.

Next, students reason about products of multi-digit numbers. They transition from using base-ten diagrams to using algorithms to record partial products.

Students learn that they can multiply the factors by place value, one digit at a time, and then organize the partial products vertically. Here are two ways to show partial products for $3{,}419 \times 8$.

$$\begin{array}{r} 3,419 \\ \times \quad 8 \\ \hline 72 \\ 80 \\ 3,200 \\ +\ 24,000 \\ \hline \end{array}$$

$$\begin{array}{r} 3,419 \\ \times \quad 8 \\ \hline 24,000 \\ 3,200 \\ 80 \\ +\ 72 \\ \hline \end{array}$$

Later in the unit, students divide dividends up to four-digit by single-digit divisors. Students see that it helps to decompose a dividend into smaller numbers and find partial quotients, just as it helps to decompose factors and find partial products.

They also recognize that sometimes it is most productive to decompose a dividend by place value. For instance, to find $465 \div 5$, we can divide each 400, 60, and 5 by 5.

$$\begin{aligned} 400 \div 5 &= 80 \\ 60 \div 5 &= 12 \\ 5 \div 5 &= 1 \\ \hline 465 \div 5 &= 93 \end{aligned}$$

Students encounter various ways to record the division process, including an algorithm that records partial quotients in a vertical arrangement.

$$\begin{array}{rl} \boxed{93} & \\ 1 & \\ 12 & \\ 80 & \\ 5\overline{)465} & \\ -\ 400 & 5 \times 80 \\ \hline 65 & \\ -\ 60 & 5 \times 12 \\ \hline 5 & \\ -\ 5 & 5 \times 1 \\ \hline 0 & \end{array}$$

At the end of the unit, students apply their expanded knowledge of operations to solve multi-step problems about measurement in various contexts—calendar days, distance, and population.

Section A: Features of Patterns

- Lesson 1: Patterns that Grow
- Lesson 2: Patterns that Repeat
- Lesson 3: Numerical Patterns
- Lesson 4: More Numerical Patterns

Section B: Multi-Digit Multiplication

- Lesson 5: Products Beyond 100
- Lesson 6: Multiply Two-Digit Numbers and One-Digit Numbers
- Lesson 7: Multiply Three- and Four-Digit Numbers by One-Digit Numbers

- Lesson 8: Multiply 2 Two-Digit Numbers
- Lesson 9: Recording Partial Products: One-Digit and Three- or Four-Digit Factors
- Lesson 10: Using Algorithms with Partial Products: 2 Two-Digit Numbers
- Lesson 11: Partial Products and the Standard Algorithm
- Lesson 12: Solve Problems Involving Multiplication

Section C: Multi-Digit Division

- Lesson 13: Situations Involving Equal-Size Groups
- Lesson 14: Situations Involving Area
- Lesson 15: Base-Ten Blocks to Divide
- Lesson 16: Base-Ten Diagrams to Represent Division
- Lesson 17: An Algorithm with Partial Quotients
- Lesson 18: Use an Algorithm with Partial Quotients
- Lesson 19: Divide with Remainders
- Lesson 20: Interpret Remainders in Division Situations
- Lesson 21: Problems with Remainders

Section D: Let's Put It to Work: Problem Solving with Large Numbers

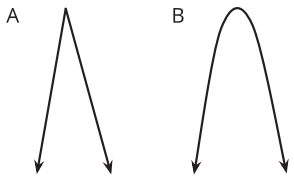
- Lesson 22: Different Ways to Solve Problems
- Lesson 23: Problems about Perimeter and Area
- Lesson 24: Solve Problems with Many Operations
- Lesson 25: Assess the Reasonableness of Solutions
- Lesson 26: Paper Flower Decorations

Unit 7: Angles and Angle Measurement

In this unit, students deepen and refine their understanding of geometric figures and measurement.

In earlier grades, students learned about two-dimensional shapes and their attributes, which they described informally early on but with increasing precision over time. Here, students formalize their intuitive knowledge about geometric features and draw them. They identify and define some building blocks of geometry (points, lines, rays, and line segments), and develop concepts and language to more precisely describe and reason about other geometric figures.

Jada says Figure A shows an angle, but Figure B does not. Do you agree?



Students analyze cases where lines intersect and where they don't (for example, parallel lines). They learn that an angle is a figure composed of two rays that share the same starting point.

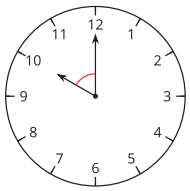
Later, students compare the sizes of angles and consider ways to quantify the comparison. They learn that angles can be measured in terms of the amount of turn one ray makes relative to another ray that shares the same vertex.

Students learn that a 1-degree angle is $\frac{1}{360}$ of a full turn or full circle and can be used to measure angles. They use a protractor to measure angles in whole-number degrees.

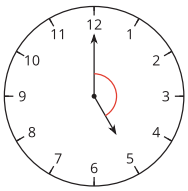
Students also learn that angles are additive. When an angle is composed of multiple non-overlapping parts, the measure of the whole is the sum of the angle measures of the parts. These insights enable students to classify angles (as acute, obtuse, right, or straight) and to solve problems about unknown angle measurements in concrete and abstract contexts.

How many degrees is each marked angle on the clock? Show your reasoning.

A



B



Section A: Points, Lines, Segments, Rays, and Angles

- Lesson 1: How Would You Describe These Figures?
- Lesson 2: Points, Lines, Rays, and Segments
- Lesson 3: Two or More Lines
- Lesson 4: Points and Lines All Around
- Lesson 5: What Is an Angle?

Section B: The Size of an Angle

- Lesson 6: Compare and Describe Angles
- Lesson 7: The Size of an Angle on a Clock
- Lesson 8: The Size of An Angle, in Degrees
- Lesson 9: Use a Protractor to Measure Angles
- Lesson 10: Angle Measurement and Perpendicular Lines
- Lesson 11: Use a Protractor to Draw Angles

Section C: Angle Analysis

- Lesson 12: Types of Angles
- Lesson 13: Find Angle Measurements
- Lesson 14: Reasoning about Angles (Part 1)
- Lesson 15: Reasoning about Angles (Part 2)
- Lesson 16: Angles, Streets, and Steps

Unit 8: Properties of Two-dimensional Shapes

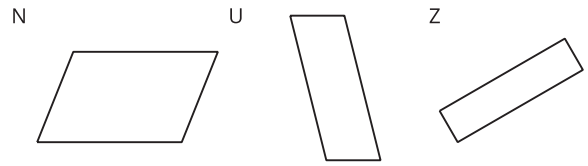
In this unit, students deepen their understanding of the attributes and measurement of two-dimensional figures.

Prior to this unit, students learned about some building blocks of geometry—points, lines, rays, segments, and angles. Students identified parallel and intersecting lines, measured angles, and classified angles based on their measurement. In this unit, they apply those insights to describe and reason about characteristics of shapes.

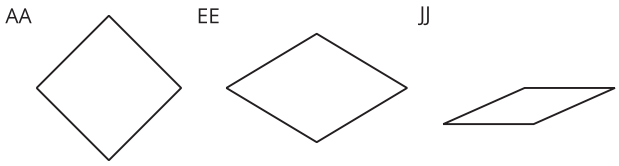
In the first half of the unit, students analyze and categorize two-dimensional shapes—triangles and quadrilaterals—by their attributes. They classify two-dimensional shapes based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Students also learn about symmetry. They identify line-

symmetric figures and draw lines of symmetry.

Quadrilaterals N, U, and Z are parallelograms.



Quadrilaterals AA, EE, and JJ are rhombuses.



Write 4–5 statements about the sides and angles of the quadrilaterals in each set. Each statement must be true for all the shapes in the set.

The second half of the unit gives students opportunities to apply their understanding of geometric attributes to solve problems about measurements (side lengths, perimeters, and angles).

Included in this unit are three optional lessons that offer opportunities for students to strengthen and extend their understanding of symmetry and other attributes of two-dimensional figures.

Section A: Side Lengths, Angles, and Lines of Symmetry

- Lesson 1: Ways to Look at Figures
- Lesson 2: Ways to Look at Triangles
- Lesson 3: Ways to Look at Quadrilaterals
- Lesson 4: Symmetry in Figures (Part 1)
- Lesson 5: Symmetry in Figures (Part 2)
- Lesson 6: All Kinds of Attributes

Section B: Reason about Attributes to Solve Problems

- Lesson 7: Ways to Find Unknown Length (Part 1)
- Lesson 8: Ways to Find Unknown Length (Part 2)
- Lesson 9: Symmetry in Action
- Lesson 10: Ways to Find Angle Measurements
- Lesson 11: Symmetry in Sports

Unit 9: 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 reinforce what they learn about comparing fractions, adding and subtracting fractions, and multiplying fractions and whole numbers. In Section B, they strengthen their ability to add and subtract multi-digit numbers fluently, using the standard algorithm. They also multiply and divide numbers by reasoning about place value and practice doing so strategically.

Here are the times of the runners for two teams.
Which team won the relay race?

runner	Diego's team, time (seconds)	Jada's team, time (seconds)
1	$10\frac{25}{100}$	$11\frac{9}{10}$
2	$11\frac{40}{100}$	$9\frac{8}{10}$
3	$9\frac{7}{10}$	$9\frac{84}{100}$
4	$10\frac{5}{100}$	$10\frac{60}{100}$

In Section C, students practice making sense of situations and solving problems that involve reasoning with multiplication and division, including multiplicative comparison and interpreting remainders. 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 (*Estimation Exploration, Number Talk,* and *Which Three Go Together?*).

The sections in this unit stand alone and are not required to be completed in order. Within a section, lessons also can be completed selectively, 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: Reason with Fractions

- Lesson 1: Add, Subtract, and Multiply Fractions
- Lesson 2: Sums and Differences of Fractions
- Lesson 3: Stories with Fractions

Section B: Whole-Number Operations

- Lesson 4: Another Look at the Standard Algorithm
- Lesson 5: Multiplication of Multi-digit Numbers
- Lesson 6: What's the Quotient?

Section C: Solve Problems with Multiplication and Division

- Lesson 7: Solve Multiplicative Comparison Problems
- Lesson 8: Solve Problems with Multiplication and Division
- Lesson 9: Create Word Problems

Section D: Creation and Design

- Lesson 10: Estimation Exploration
- Lesson 11: Which Three Go Together
- Lesson 12: Number Talk

Pacing Guide

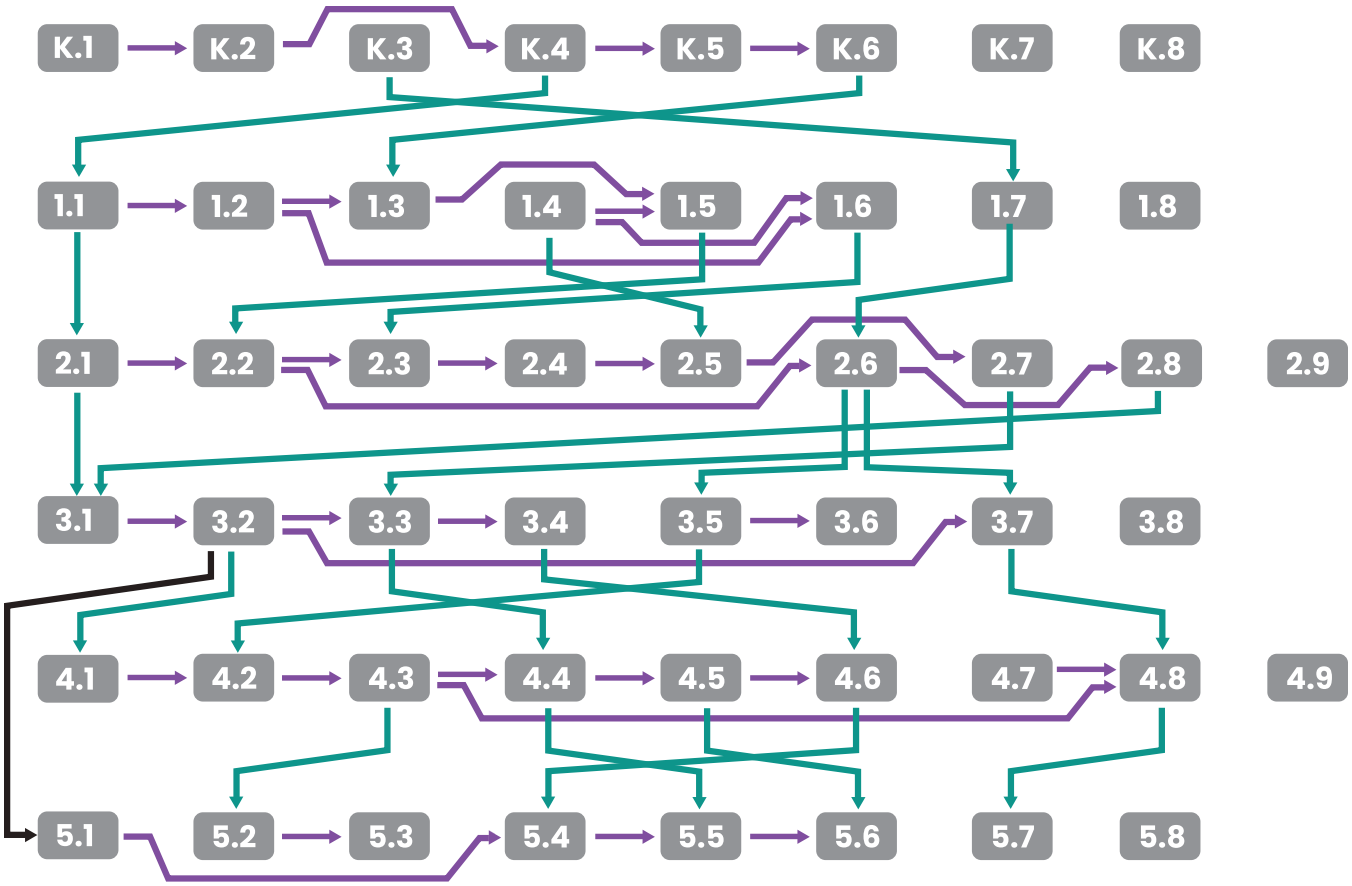
The number of days includes two assessment days per unit. The upper bound of the range includes optional lessons.

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

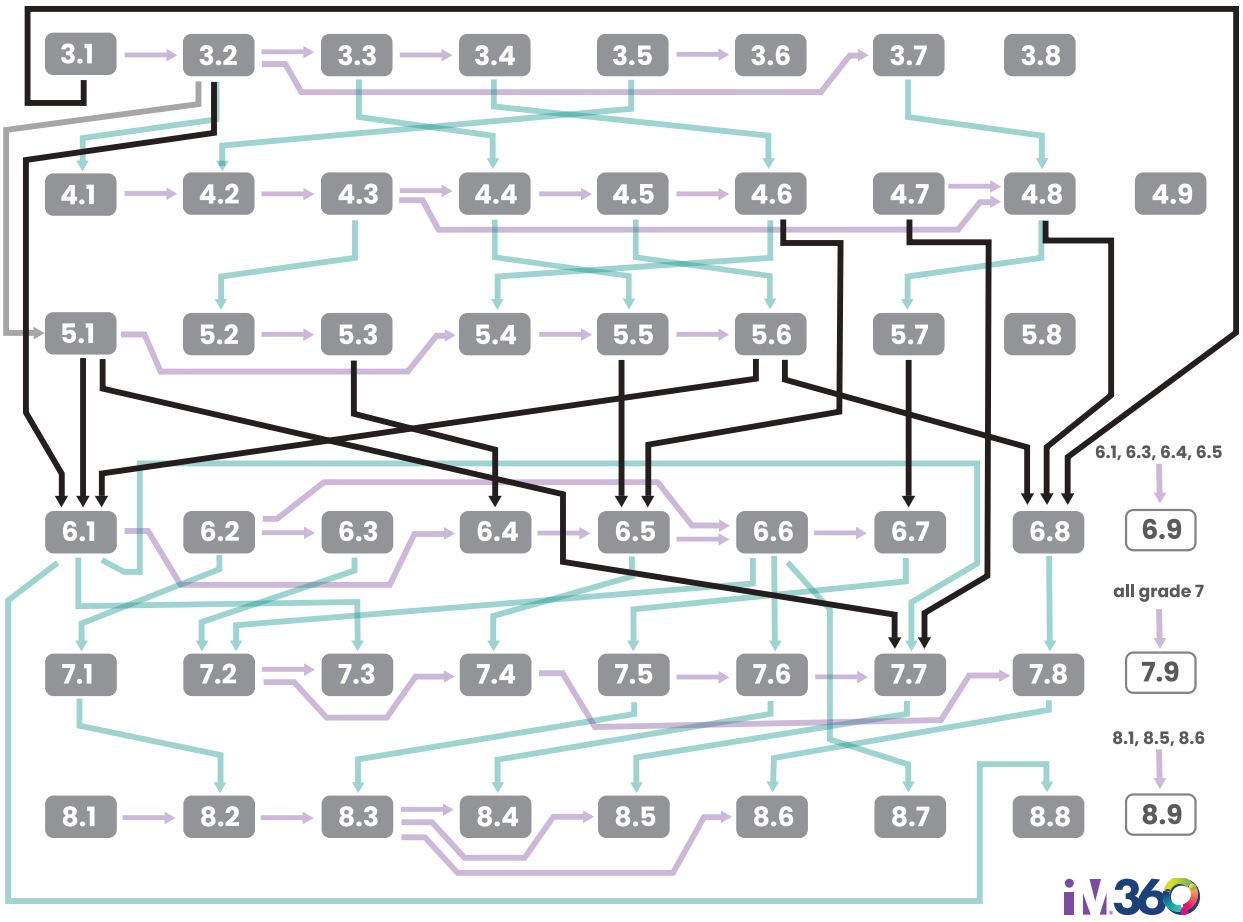
	Grade 3	Grade 4	Grade 5
week 1	Unit 1 Introducing Multiplication (22–23 days) Optional Lesson: 21	Unit 1 Factors and Multiples (8–10 days) Optional Lessons: 4, 8	Unit 1 Finding Volume (14–15 days) Optional Lesson: 12
week 2			
week 3		Unit 2 Fraction Equivalence and Comparison (18–19 days) Optional Lesson: 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		Unit 5 Multiplicative Comparison and Measurement (19-20 days) Optional Lesson: 18	
week 16			Unit 5 Place Value Patterns and Decimal Operations (26–28 days) Optional Lessons: 4, 26
week 17			
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			Unit 6 More Decimal and Fraction Operations (21–23 days) Optional Lessons: 20, 21
week 23	Unit 6 Measuring Length, Time, Liquid Volume, and Weight (17–18 days) Optional Lesson: 16		
week 24		Unit 7 Angles and Angle Measurement (17–18 days) Optional Lesson: 16	
week 25			
week 26			Unit 7 Shapes on the Coordinate Plane (15 -16 days) Optional Lesson: 14
week 27	Unit 7 Two-dimensional Shapes and Perimeter (16 - 17 days) Optional Lesson: 15		
week 28		Unit 8 Properties of Two-dimensional Shapes (9–13 days) Optional Lessons: 6, 9, 10, 11	
week 29			
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.

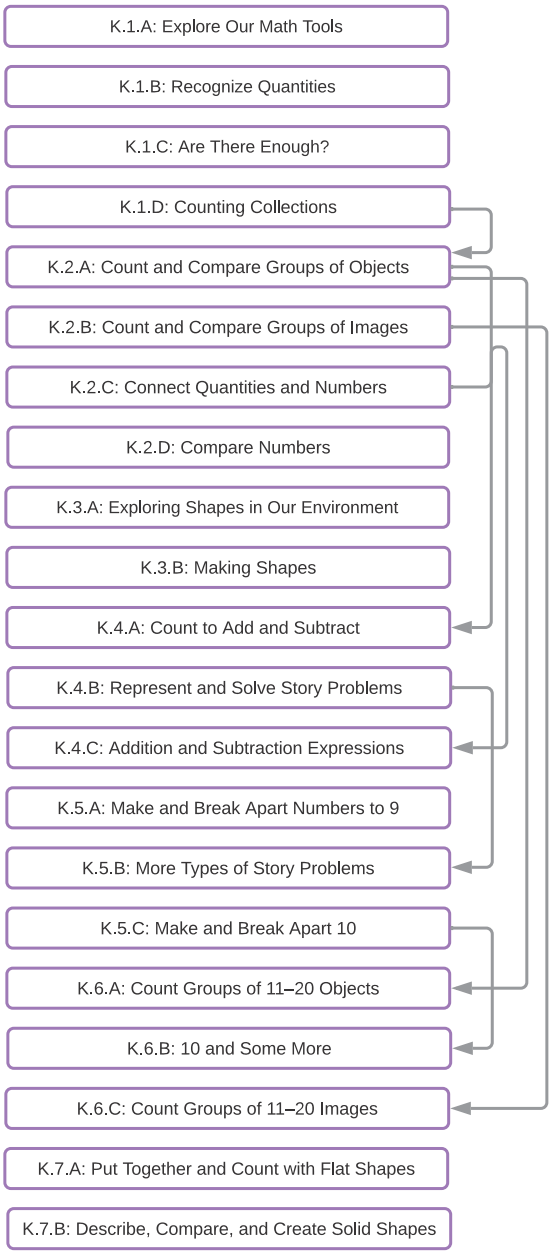


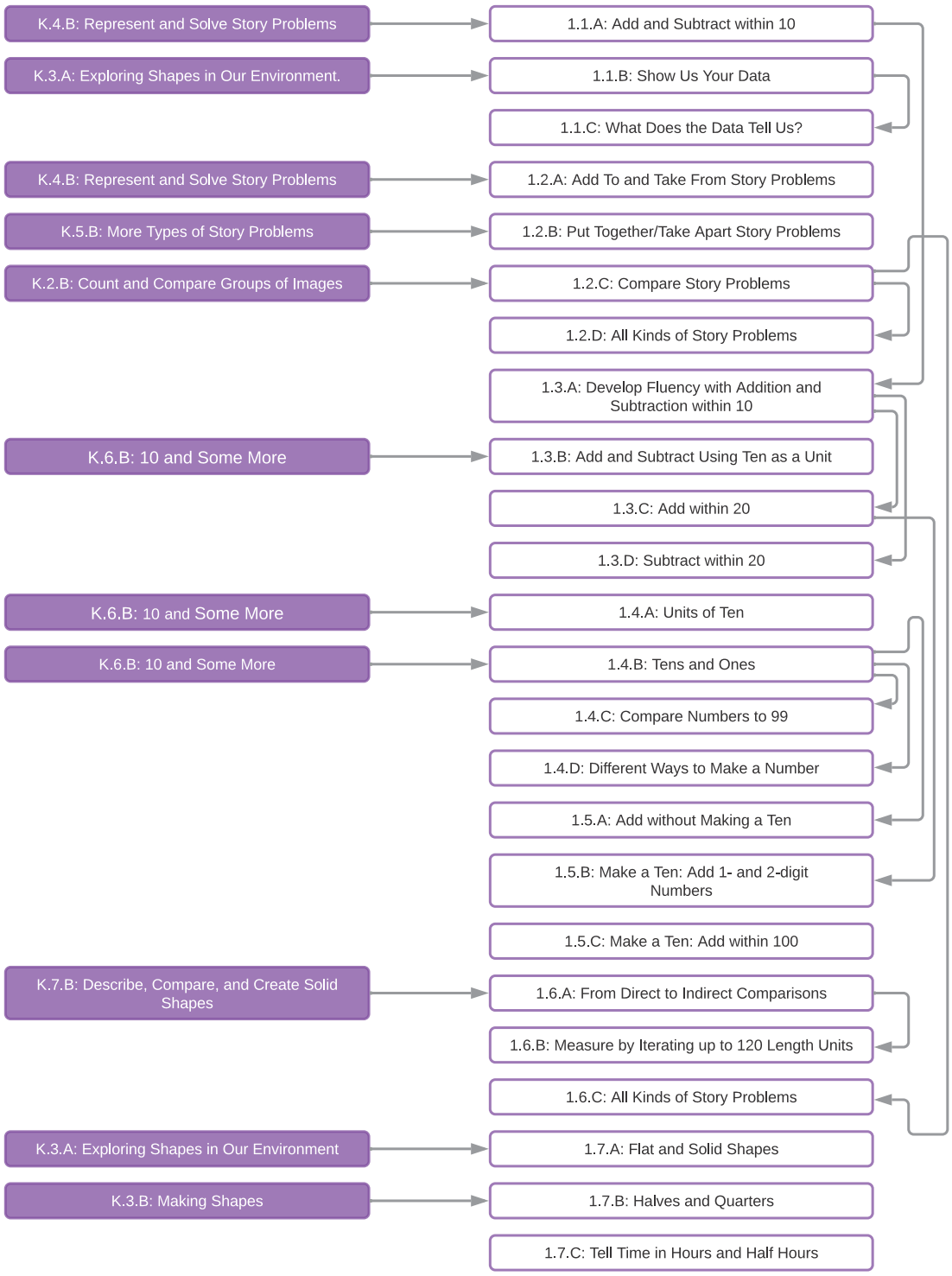
The following chart shows unit dependencies across the curriculum for IM Grades 3–8.

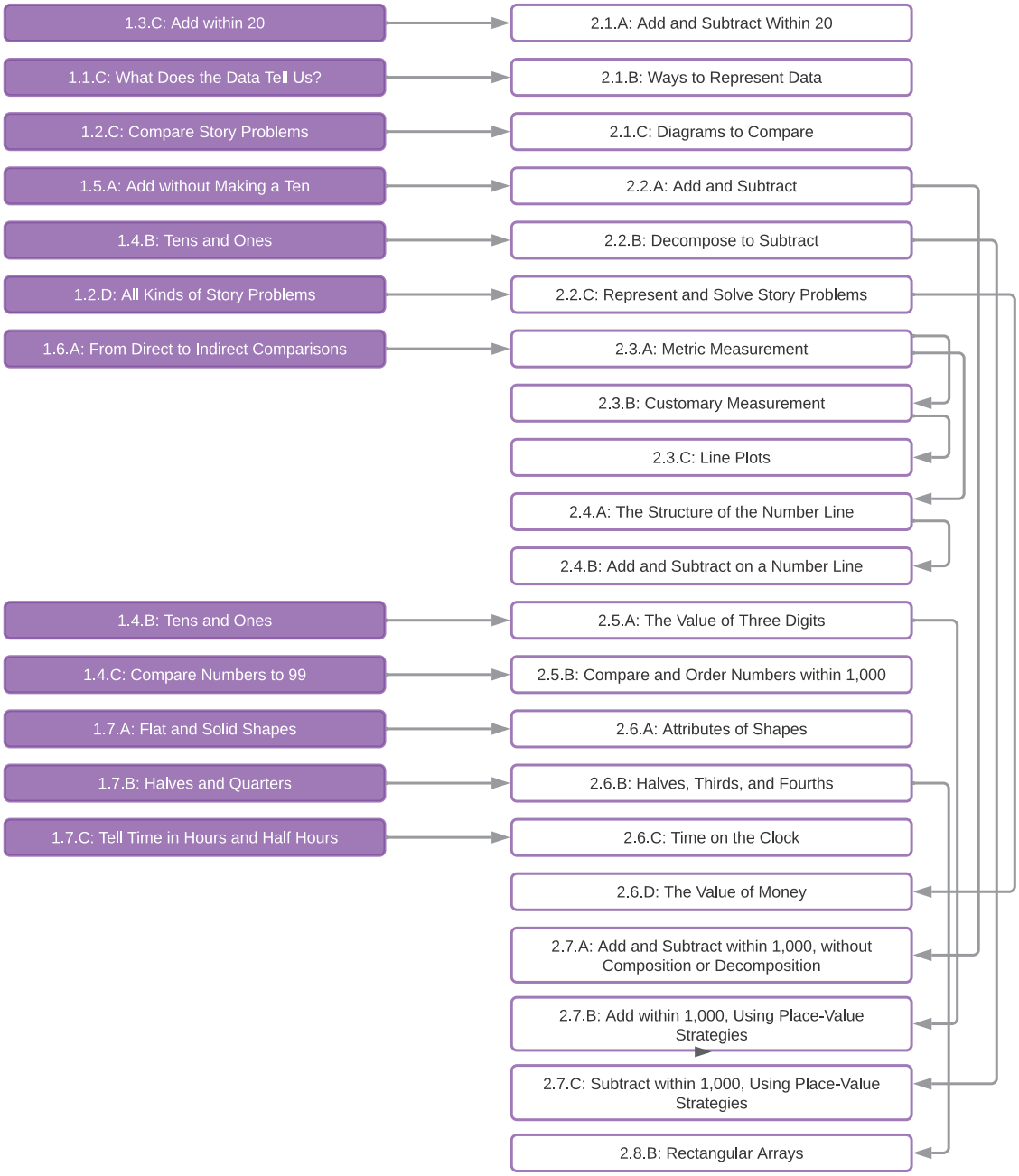


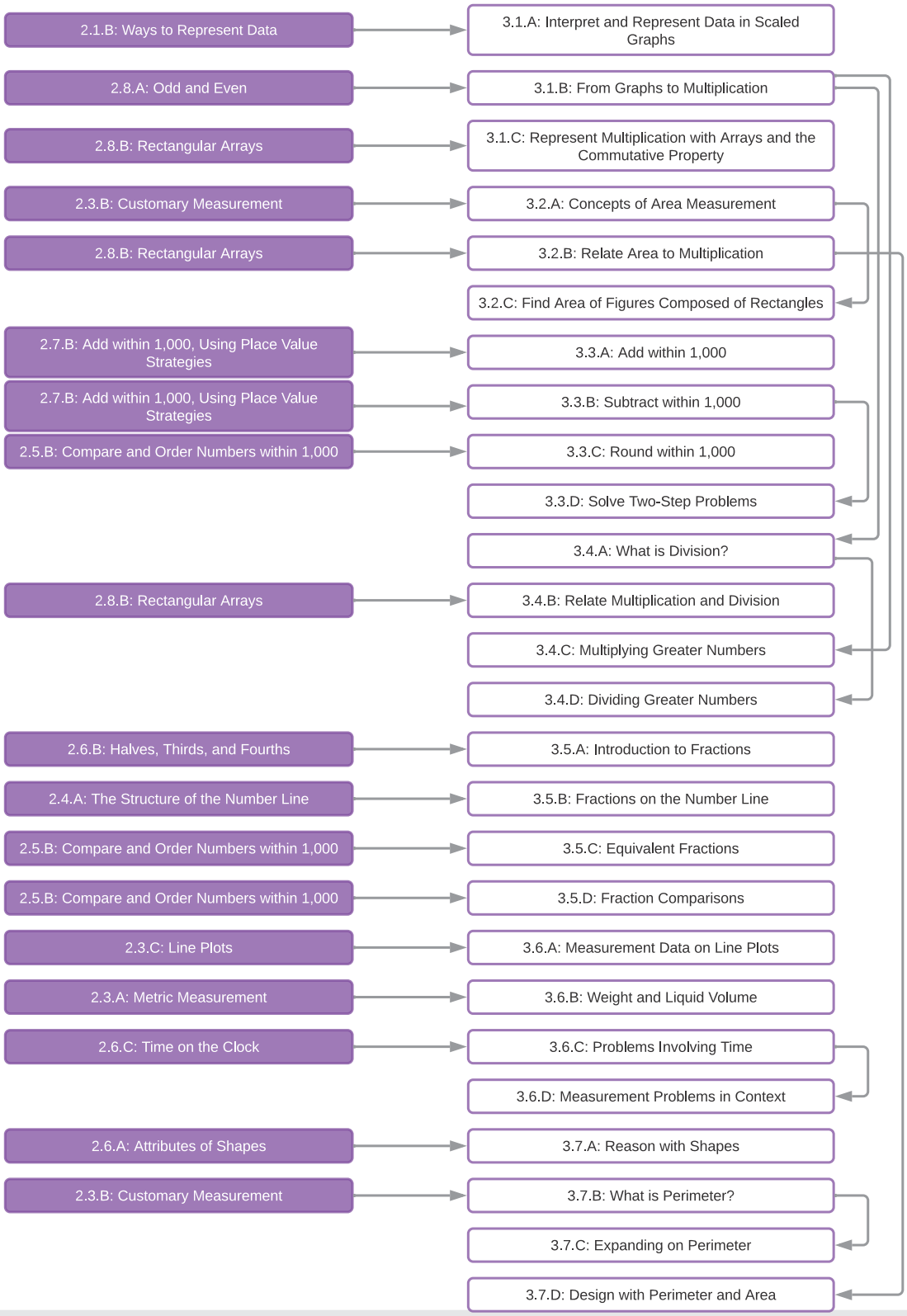
Section Dependency Diagrams

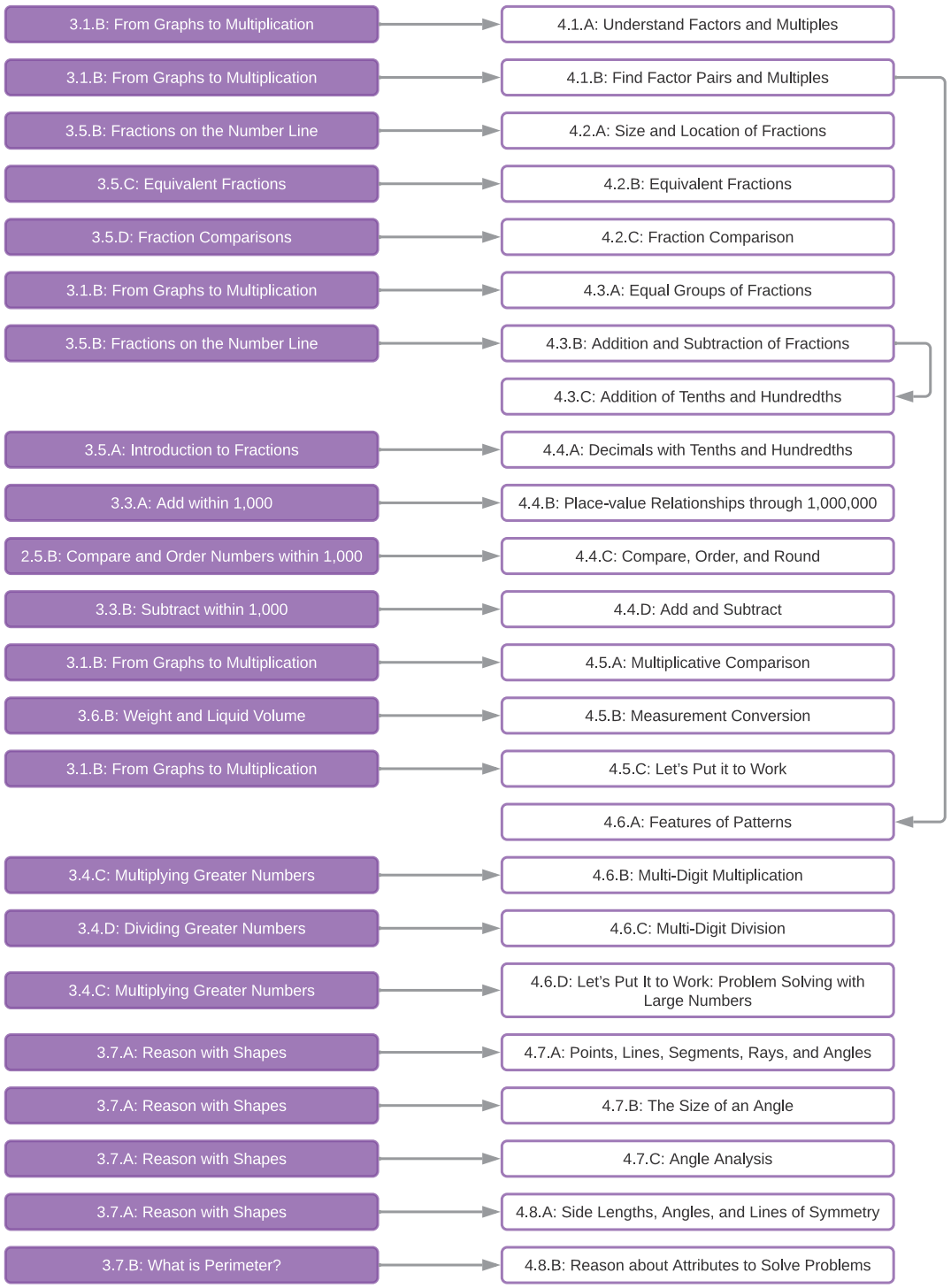
In the section dependency charts, an arrow indicates the prior section that contains content most directly designed to support or build toward the content in the current section.

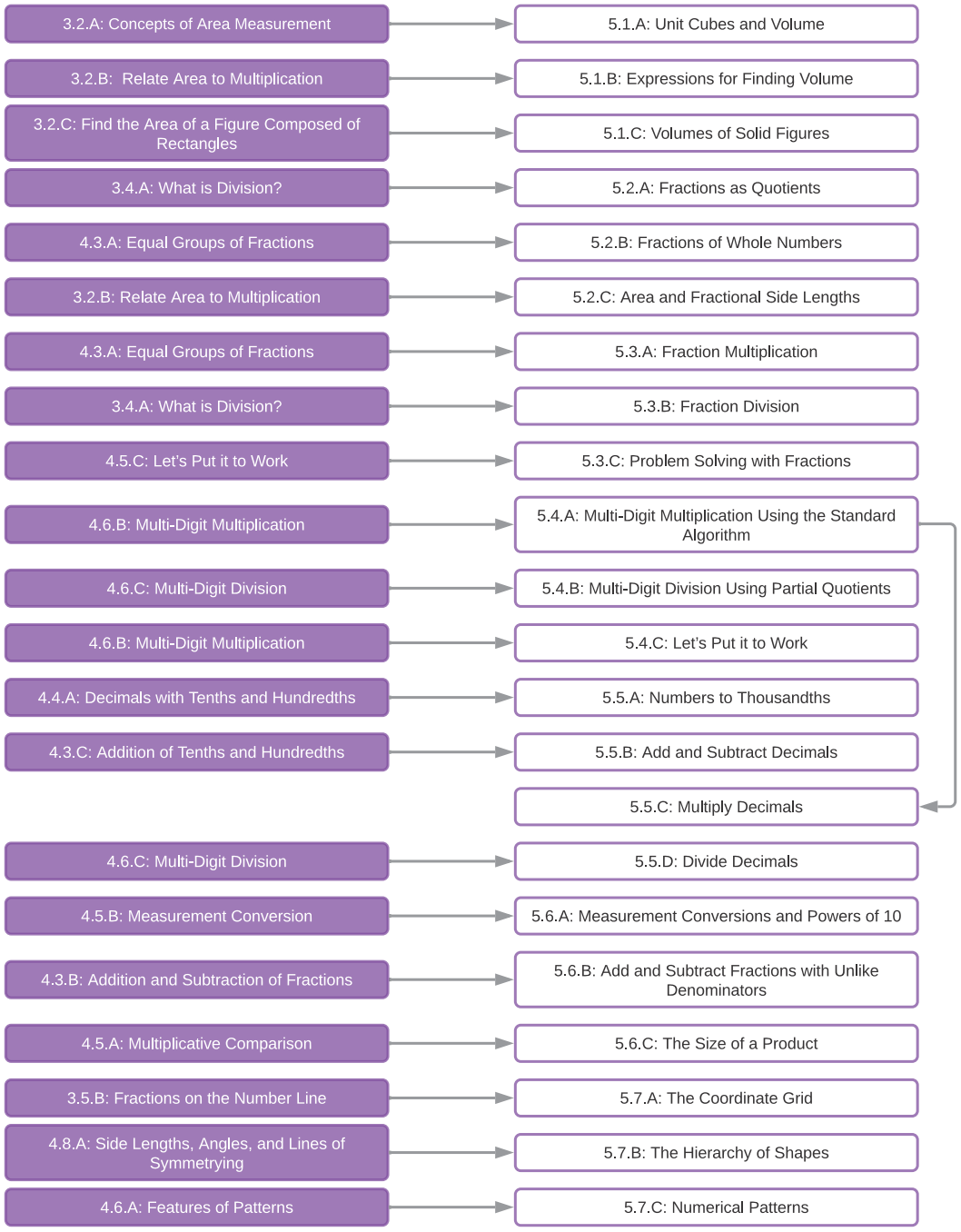

K.1.A: Explore Our Math Tools
K.1.B: Recognize Quantities
K.1.C: Are There Enough?
K.1.D: Counting Collections
K.2.A: Count and Compare Groups of Objects
K.2.B: Count and Compare Groups of Images
K.2.C: Connect Quantities and Numbers
K.2.D: Compare Numbers
K.3.A: Exploring Shapes in Our Environment
K.3.B: 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
1.1.A: Add and Subtract within 10
K.3.A: Exploring Shapes in Our Environment.
1.1.B: Show Us Your Data
1.1.C: What Does the Data Tell Us?
K.4.B: Represent and Solve Story Problems
1.2.A: Add To and Take From Story Problems
K.5.B: More Types of Story Problems
1.2.B: Put Together/Take Apart Story Problems
K.2.B: Count and Compare Groups of Images
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
K.6.B: 10 and Some More
1.3.B: Add and Subtract Using Ten as a Unit
1.3.C: Add within 20
1.3.D: Subtract within 20
K.6.B: 10 and Some More
1.4.A: Units of Ten
K.6.B: 10 and Some More
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
K.7.B: Describe, Compare, and Create Solid Shapes
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
K.3.A: Exploring Shapes in Our Environment
1.7.A: Flat and Solid Shapes
K.3.B: Making Shapes
1.7.B: Halves and Quarters
1.7.C: Tell Time in Hours and Half Hours


1.3.C: Add within 20
2.1.A: Add and Subtract Within 20
1.1.C: What Does the Data Tell Us?
2.1.B: Ways to Represent Data
1.2.C: Compare Story Problems
2.1.C: Diagrams to Compare
1.5.A: Add without Making a Ten
2.2.A: Add and Subtract
1.4.B: Tens and Ones
2.2.B: Decompose to Subtract
1.2.D: All Kinds of Story Problems
2.2.C: Represent and Solve Story Problems
1.6.A: From Direct to Indirect Comparisons
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
1.4.B: Tens and Ones
2.5.A: The Value of Three Digits
1.4.C: Compare Numbers to 99
2.5.B: Compare and Order Numbers within 1,000
1.7.A: Flat and Solid Shapes
2.6.A: Attributes of Shapes
1.7.B: Halves and Quarters
2.6.B: Halves, Thirds, and Fourths
1.7.C: Tell Time in Hours and Half Hours
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