Scope and Sequence for Grade 3

The big ideas in IM Grade 3 include: developing understanding of multiplication and division, and strategies for multiplication and division within 100; developing understanding of fractions, especially unit fractions (fractions with numerator 1); developing understanding of the structure of rectangular arrays and of area; and describing and analyzing two-dimensional shapes.

Unit 1: Introducing Multiplication

In this unit, students interpret and represent data on scaled picture graphs and scaled bar graphs. Then they learn the concept of multiplication.

This is the first of four units that focus on multiplication. In this unit, students explore scaled picture graphs and bar graphs as an entry point for learning about equal-size groups and multiplication.

In grade 2, students analyzed picture graphs in which one picture represented one object and bar graphs that were scaled by single units. Here, students encounter picture graphs in which each picture represents more than one object and bar graphs that are scaled by 2, 5, or 10 units. The idea that one picture can represent multiple objects helps to introduce the idea of equal-size groups.

Students learn that multiplication can mean finding the total number of objects in a groups of b objects each, and can be represented by $a \times b$. They then relate the idea of equal groups and the expression $a \times b$ to the rows and columns of an array. In working with arrays, students begin to notice the commutative property of multiplication.

In all cases, students make sense of the meaning of multiplication expressions before finding their value and before writing equations that relate two factors and a product.

Later in the unit, students see situations in which the total number of objects is known but either the number of groups or the size of each group is not known. Problems with a missing factor offer students a preview to division.

Throughout the unit, students should have access to connecting cubes or counters, as they may choose to use such tools to represent and solve problems.

Section A: Interpret and Represent Data in Scaled Graphs

- Lesson 1: Make Sense of Data
- Lesson 2: Represent Data and Solve Problems
- Lesson 3: Scaled Picture Graphs
- Lesson 4: Create Scaled Picture Graphs
- Lesson 5: Represent Data in Scaled Bar Graphs
- Lesson 6: Choose a Scale
- Lesson 7: Answer Questions about Scaled Bar Graphs
- Lesson 8: More Questions about Scaled Bar Graphs

Section B: From Graphs to Multiplication

- Lesson 9: Multiplication for Equal Groups
- Lesson 10: Situations, Drawings, and Diagrams, Oh My!
- Lesson 11: Multiplication Expressions
- Lesson 12: Represent and Solve Multiplication Problems
- Lesson 13: Multiplication Equations

- Lesson 14: Write and Solve Equations with Unknowns
- Lesson 15: More Factors, More Problems

Section C: Represent Multiplication with Arrays and the Commutative Property

- Lesson 16: Arrange Objects into Arrays
- Lesson 17: Match and Draw Arrays
- Lesson 18: Represent Arrays with Expressions
- Lesson 19: Solve Problems Involving Arrays
- Lesson 20: The Commutative Property
- Lesson 21: Game Night Seating Plan

Unit 2: Area and Multiplication

In this unit, students encounter the concept of area, relate the area of a rectangle to multiplication, and solve problems involving area.

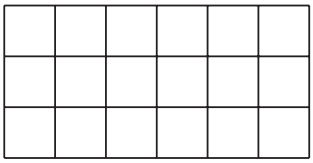
In grade 2, students explored attributes of shapes, such as number of sides, number of vertices, and lengths of sides. They measured and compared lengths (including side lengths of shapes).

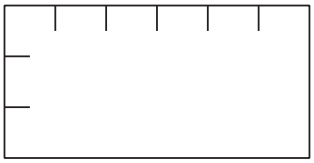
In this unit, students make sense of another attribute of shapes: a measure of how much space a shape covers. They begin informally, by comparing two shapes and deciding which one covers more space. Later, they compare more precisely by tiling shapes with pattern blocks and square tiles. Students learn that the area of a flat figure is the number of square units that cover it without gaps or overlaps.

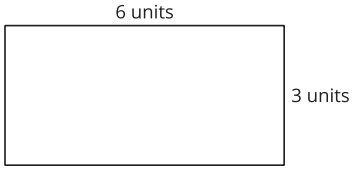
Students then focus on the area of a rectangle. They notice that a rectangle tiled with squares forms an array, with the rows and the columns as equal-size groups. This observation allows them to connect the area of a rectangle to multiplication—as a product of the number of rows and the number of squares per row.

To transition from counting to multiplying side lengths, students reason about area, using increasingly more abstract representations. They begin with tiled or gridded rectangles, move to partially gridded rectangles or those with marked sides, and end with rectangles labeled with their side lengths.

$$6 \times 3 = 18$$







Students also learn some standard units of area—square inch, square centimeter, square foot, and square meter—and solve real-world problems involving the areas of rectangles.

Later in the unit, students find the area and the unknown side lengths of figures composed of non-overlapping rectangles. This work includes cases with two non-overlapping rectangles that share one side, which lays the groundwork for understanding the distributive property of multiplication in a later unit.

Section A: Concepts of Area Measurement

- Lesson 1: What Is Area?
- Lesson 2: How Do We Measure Area?

- Lesson 3: Tile Rectangles
- Lesson 4: Area of a Rectangle

Section B: Relate Area to Multiplication

- Lesson 5: Represent Products as Areas
- Lesson 6: Different Square Units (Part 1)
- Lesson 7: Different Square Units (Part 2)
- Lesson 8: Area of a Rectangle without a Grid
- Lesson 9: Measure to Find the Area
- Lesson 10: Solve Area Problems
- Lesson 11: Area and the Multiplication Table

Section C: Find the Area of a Figure Composed of Rectangles

- Lesson 12: Area and Addition
- Lesson 13: Find the Area of a Figure
- Lesson 14: Find the Area of a Figure with Unknown Side Lengths
- Lesson 15: New Room

Unit 3: Wrapping Up Addition and Subtraction within 1,000

In this unit, students work toward the goal of fluently adding and subtracting within 1,000. They use mental math strategies developed in grade 2, and learn algorithms based on place value.

In grade 2, students added and subtracted within 1,000, using strategies based on place value, properties of operations, and the relationship between addition and subtraction. When students combine hundreds, tens, and ones, they use place-value understanding. When they decompose numbers to add or subtract, they rely on the commutative and associative properties. When students count up to subtract, they use the relationship between addition and subtraction.

To move toward fluency, students learn a few different algorithms that work with any numbers and are generalizable to greater numbers and decimals. Students work with a variety of algorithms, starting with those that show expanded form, and moving toward algorithms that are more streamlined and closer to the standard algorithm.

$$\begin{array}{rrrrrr} & 300 & + & 30 & + & 7 \\ + & 200 & + & 30 & + & 6 \\ \hline & 500 & + & 60 & + & 13 \end{array}$$

$$\begin{array}{rrrrrr} & & & 60 & & 13 \\ & (500 & + & \cancel{70} & + & \cancel{3}) \\ - & (200 & + & 30 & + & 6) \\ \hline & 300 & + & 30 & + & 7 \end{array}$$

Students explore various algorithms but are not required to use a specific one. They should, however, move from the strategy-based work of grade 2 to algorithm-based work, to set the stage for using the standard algorithm in grade 4. If students begin the unit with knowledge of the standard algorithm, it is still important for them to make sense of the place-value basis of the algorithm.

Understanding of place value also comes into play as students round numbers to the nearest multiples of 10 and of 100. Students do not need to know a formal definition of "multiples" until grade 4. At this point, it is enough to recognize that a multiple of 10 is a number called out when counting by 10, or the total in a whole-number of tens (such as 8 tens). Likewise, a multiple of 100 is a number called out when counting by 100, or the total in a whole-number of hundreds (such as 6 hundreds). Students use rounding to estimate answers to two-step problems and to determine if answers are reasonable.

Section A: Add within 1,000

- Lesson 1: Represent Numbers in Different Ways
- Lesson 2: Addition and Subtraction Situations
- Lesson 3: Add Your Way
- Lesson 4: Introduction to Addition Algorithms
- Lesson 5: Another Addition Algorithm
- Lesson 6: Use Strategies and Algorithms to Add

Section B: Subtract within 1,000

- Lesson 7: Subtract Your Way
- Lesson 8: Subtraction Algorithms (Part 1)
- Lesson 9: Subtraction Algorithms (Part 2)
- Lesson 10: Subtraction Algorithms (Part 3)
- Lesson 11: Analyze Subtraction Algorithms
- Lesson 12: Subtract Strategically

Section C: Round within 1,000

- Lesson 13: Multiples of 100
- Lesson 14: Nearest Multiples of 10 and of 100
- Lesson 15: Round to the Nearest Ten and the Nearest Hundred
- Lesson 16: Round and Round Again

Section D: Solve Two-Step Problems

- Lesson 17: Does It Make Sense?
- Lesson 18: Diagrams and Equations for Word Problems
- Lesson 19: Situations and Equations
- Lesson 20: More Practice to Represent and Solve
- Lesson 21: Classroom Supplies

Unit 4: Relating Multiplication to Division

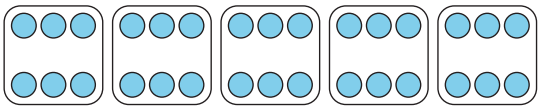
This unit introduces students to the concept of division and its relationship to multiplication.

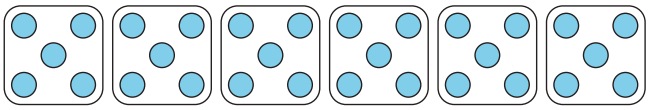
Previously, students learned that multiplication can be understood in terms of equal-size groups. The expression 5×2 can represent the total number of objects when there are 5 groups of 2 objects, or when there are 2 groups of 5 objects.

Here, students make sense of division also in terms of equal-size groups. For instance, the expression $30 \div 5$ can represent putting 30 objects into 5 equal groups, or putting 30 objects into groups of 5. Students see that, in general, dividing can mean finding the size of each group, or finding the number of equal groups.

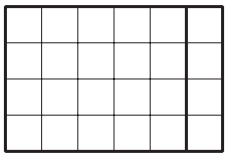
30 objects put into 5 equal groups

30 objects put into groups of 5

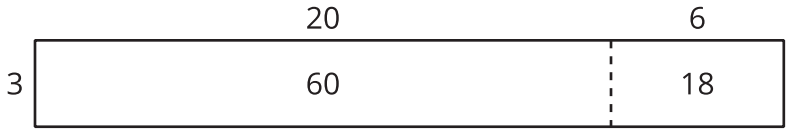




Students use the relationship between multiplication and division to develop fluency with single-digit multiplication and division facts. They continue to reason about products of two numbers in terms of the area of rectangles whose side lengths represent the factors, decomposing side lengths and applying properties of operations along the way.



As they multiply numbers greater than 10, students see that it is helpful to decompose the two-digit factor into tens and ones and distribute the multiplication. For instance, to find the value of 26×3, they can decompose the 26 into 20 and 6, and then multiply each by 3.



Toward the end of the unit, students solve two-step problems that involve all four operations. In some situations, students work with expressions that use parentheses to indicate which operation is completed first (for example: $276 + (45 \div 5) = ?$).

Section A: What Is Division?

- Lesson 1: How Many Groups?
- Lesson 2: How Many in Each Group?
- Lesson 3: Division Situation Drawings
- Lesson 4: Interpret Division Expressions
- Lesson 5: Write Division Expressions

Section B: Relate Multiplication and Division

- Lesson 6: Division as an Unknown Factor
- Lesson 7: Relate Multiplication and Division
- Lesson 8: Relate Quotients to Familiar Products
- Lesson 9: Patterns in the Multiplication Table
- Lesson 10: Explore Multiplication Strategies with Rectangles
- Lesson 11: Multiplication Strategies on Ungridded Rectangles

Section C: Multiplying Greater Numbers

- Lesson 12: Multiply Multiples of 10
- Lesson 13: Solve Problems with Equal Groups
- Lesson 14: Ways to Represent Multiplication of Teen Numbers
- Lesson 15: Equal Groups, Greater Numbers

- Lesson 16: Multiply Numbers Greater than 20
- Lesson 17: Use the 4 Operations to Solve Problems

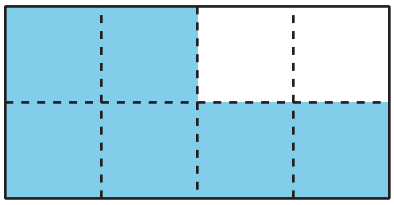
Section D: Dividing Greater Numbers

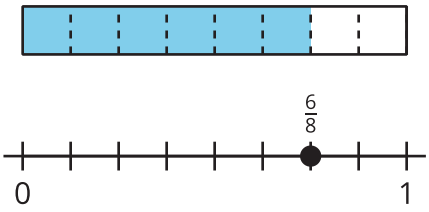
- Lesson 18: Greater Numbers in Equal Groups
- Lesson 19: Ways to Divide Greater Numbers
- Lesson 20: Strategies for Dividing
- Lesson 21: Solve Problems Using the Four Operations
- Lesson 22: School Community Garden

Unit 5: Fractions as Numbers

In this unit, students make sense of fractions as numbers, using various diagrams to represent and reason about fractions, compare their sizes, and relate them to whole numbers. The denominators of the fractions explored here are limited to 2, 3, 4, 6, and 8.

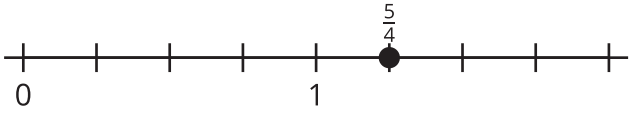
In grade 2, students partitioned circles and rectangles into equal parts and used the language "halves," "thirds," and "fourths." Students begin this unit in a similar way, by reasoning about the sizes of shaded parts in shapes. Next, they create fraction strips by folding strips of paper into equal parts, and later represent the strips as tape diagrams.





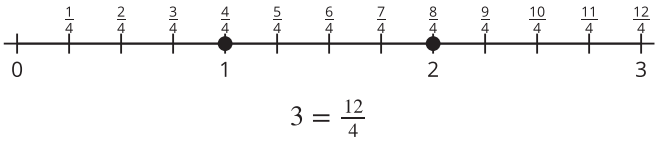
Using fraction strips and tape diagrams to represent fractions prepare students to think about fractions more abstractly as lengths and locations on the number line. This work builds on students' prior experience with representing whole numbers on the number line.

In each representation, students take care to identify 1 whole. This helps them reason about the size of the parts and whether a fraction is less than or greater than 1. (Fractions greater than 1 are not treated as special cases.)



Students then use these representations to learn about equivalent fractions and to compare fractions.

They see that fractions are equivalent if they are the same size or at the same location on the number line, and that some fractions are the same size as whole numbers.



Later in the unit, students compare fractions with the same denominator and those with the same numerator. They recognize that as the numerator gets larger, more parts are counted, and as the denominator gets larger, the size of each part that makes up the whole gets smaller.

Section A: Introduction to Fractions

- Lesson 1: Name the Parts

- Lesson 2: Name Parts as Fractions
- Lesson 3: Non-unit Fractions
- Lesson 4: Build Fractions from Unit Fractions

Section B: Fractions on the Number Line

- Lesson 5: To the Number Line
- Lesson 6: Locate Unit Fractions on the Number Line
- Lesson 7: Non-unit Fractions on the Number Line
- Lesson 8: Fractions and Whole Numbers
- Lesson 9: All Kinds of Numbers on the Number Line

Section C: Equivalent Fractions

- Lesson 10: Equivalent Fractions
- Lesson 11: Generate Equivalent Fractions
- Lesson 12: Equivalent Fractions on a Number Line
- Lesson 13: Whole Numbers and Fractions

Section D: Fraction Comparisons

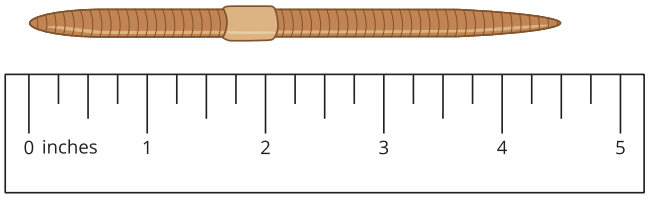
- Lesson 14: How Do You Compare Fractions?
- Lesson 15: Compare Fractions with the Same Denominator
- Lesson 16: Compare Fractions with the Same Numerator
- Lesson 17: Compare Fractions
- Lesson 18: Plan a Fun Run

Unit 6: Measuring Length, Time, Liquid Volume, and Weight

In this unit, students measure length, weight, liquid volume, and time. They begin with a study of length measurement, building on their recent work with fractions.

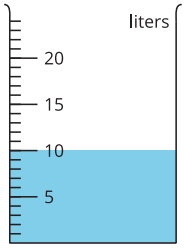
In grade 2, students measured lengths using informal and formal units to the nearest whole number. They also plotted such length data on line plots. Here, students explore length measurements in halves and fourths of an inch. They use a ruler to collect measurements and then display the data on line plots, learning about mixed numbers and revisiting equivalent fractions along the way.

Kiran says that the worm is $4\frac{2}{4}$ inches long.
Jada says that the worm is $4\frac{1}{2}$ inches long.
Use the ruler to explain how both of their measurements are correct.



Next, students learn about standard units for measuring weight (kilograms and grams) and liquid volume (liters). To build a sense of the weight of 1 gram or 1 kilogram, students hold common objects, such as paper clips and bottles of water.

To gain familiarity with liters, students measure the volume of a container by filling it with water by the liter and estimate the volume of everyday containers, such as pots, tubs, and buckets. They then use the scale on measurement tools to measure and represent the volume of liquids.



From there, students move on to measure time. In grade 2, they told and wrote time to the nearest 5 minutes. Now, they tell time to the minute, using the relationship between the hour hand and the minute hand to make sense of times such as 3:57 p.m.

In the final section of the unit, students make sense of and solve problems related to all three measurements. The work here allows students to continue to develop their fluency with addition and subtraction within 1,000 and understanding of properties of operations. It also prompts them to use the relationship between multiplication and division to solve problems.

Section A: Measurement Data on Line Plots

- Lesson 1: Measure in Halves of an Inch
- Lesson 2: Measure in Fourths of an Inch
- Lesson 3: Measure in Halves and Fourths of an Inch
- Lesson 4: Interpret Measurement Data on Line Plots
- Lesson 5: Represent Measurement Data on Line Plots

Section B: Weight and Liquid Volume

- Lesson 6: Estimate and Measure Weight
- Lesson 7: Introduction to Liquid Volume
- Lesson 8: Estimate and Measure Liquid Volume

Section C: Problems Involving Time

- Lesson 9: Time to the Nearest Minute
- Lesson 10: Solve Problems Involving Time (Part 1)
- Lesson 11: Solve Problems Involving Time (Part 2)

Section D: Measurement Problems in Context

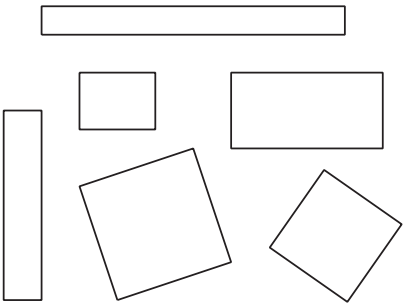
- Lesson 12: Ways to Represent Measurement Situations
- Lesson 13: Problems with Missing Information
- Lesson 14: What Makes Sense in the Problem?
- Lesson 15: Ways to Solve Problems and Show Solutions
- Lesson 16: Design a Game

Unit 7: Two-Dimensional Shapes and Perimeter

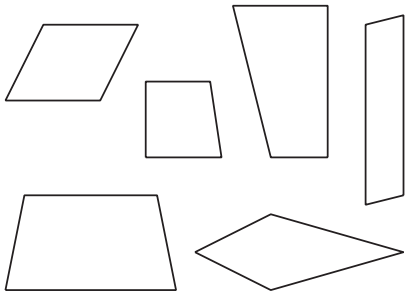
In this unit, students reason about attributes of two-dimensional shapes and learn about perimeter.

Students learn to describe, compare, and sort two-dimensional shapes in earlier grades. In this unit, students continue to develop language that is increasingly more precise to describe and categorize shapes. Students learn to classify broader categories of shapes (quadrilaterals and triangles) into more specific subcategories based on their attributes. For instance, they study examples and non-examples of rhombuses, rectangles, and squares, to recognize their specific attributes.

These are rectangles.



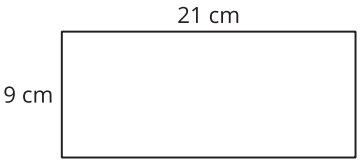
These are not rectangles.



Students also expand their knowledge about attributes that can be measured.

Previously, they learned the meaning of area and found the area of rectangles and figures composed of rectangles. In this unit, students learn the meaning of perimeter and find the perimeter of shapes. They consider geometric attributes of shapes (such as opposite sides having the same length) that can help them find perimeter.

Find the perimeter of this rectangle.



As the lessons progress, they consider situations that involve perimeter, and then those that involve both perimeter and area. These lessons aim to distinguish the two attributes (which are commonly confused) and reinforce that perimeter measures length or distance (in length units) and area measures the amount of space covered by a shape (in square units).

At the end of the unit, students solve problems in a variety of contexts. They apply what they learn about geometric attributes of shapes, perimeter, and area, to design a park, and a West African wax print pattern. They then solve problems within the context of their design.

Section A: Reason with Shapes

- Lesson 1: What Attributes Do You See?
- Lesson 2: Attributes of Triangles and Quadrilaterals
- Lesson 3: Attributes that Define Shapes
- Lesson 4: Attributes of Rectangles, Rhombuses, and Squares
- Lesson 5: Attributes of Other Quadrilaterals

Section B: What is Perimeter?

- Lesson 6: Distance around Shapes
- Lesson 7: Same Perimeter, Different Shapes
- Lesson 8: Find the Perimeter
- Lesson 9: Perimeter Problems

Section C: Expanding on Perimeter

- Lesson 10: Problem Solving with Perimeter and Area
- Lesson 11: Rectangles with the Same Perimeter
- Lesson 12: Rectangles with the Same Area

Section D: Design with Perimeter and Area

- Lesson 13: Shapes and Play
- Lesson 14: Wax Prints
- Lesson 15: A Space for Chickens

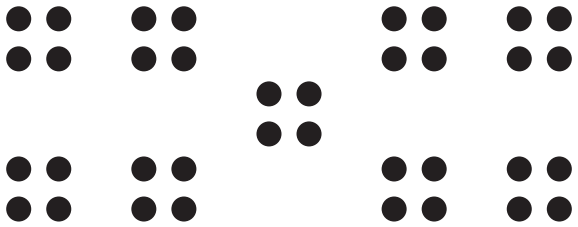
Unit 8: Putting It All Together

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

In Section A, students reinforce what they learned about fractions, their sizes, and their locations on the number line. In Section B, students deepen their understanding of perimeter, area, and scaled graphs by solving problems about measurement and data. Two of the lessons invite students to design a tiny house that meets certain conditions and to calculate the cost for furnishing it.

Section C enables students to work toward multiplication and division fluency goals through games. In Section D, 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*, and *How Many Do You See?*).

How many do you see? How do you see them?



The concepts and skills strengthened in this unit prepare students for major work in grade 4: comparing, adding, and subtracting fractions, multiplying and dividing within 1,000, and using the standard algorithm to add and subtract multi-digit numbers within 1 million.

The sections in this unit are standalone sections, with no requirement to be completed in order. Within each section, many lessons also can be completed independently of those preceding them. 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: Fraction Fun

- Lesson 1: Estimation Explorations with Fractions
- Lesson 2: Create Your Own Number Line
- Lesson 3: Fractions Round Table

Section B: Measurement and Data

- Lesson 4: Tiny House: Design and Solve

- Lesson 5: Tiny House: Cost
- Lesson 6: Survey the Class, Survey the School
- Lesson 7: Graph and Answer

Section C: Multiplication and Division Games

- Lesson 8: Multiplication Center Day
- Lesson 9: Multiplication Game Day
- Lesson 10: Multiplication and Division
- Lesson 11: Division Game Day

Section D: Create and Design

- Lesson 12: Notice and Wonder
- Lesson 13: How Many Do You See?
- Lesson 14: Estimation Exploration
- Lesson 15: Number Talk

Pacing Guide

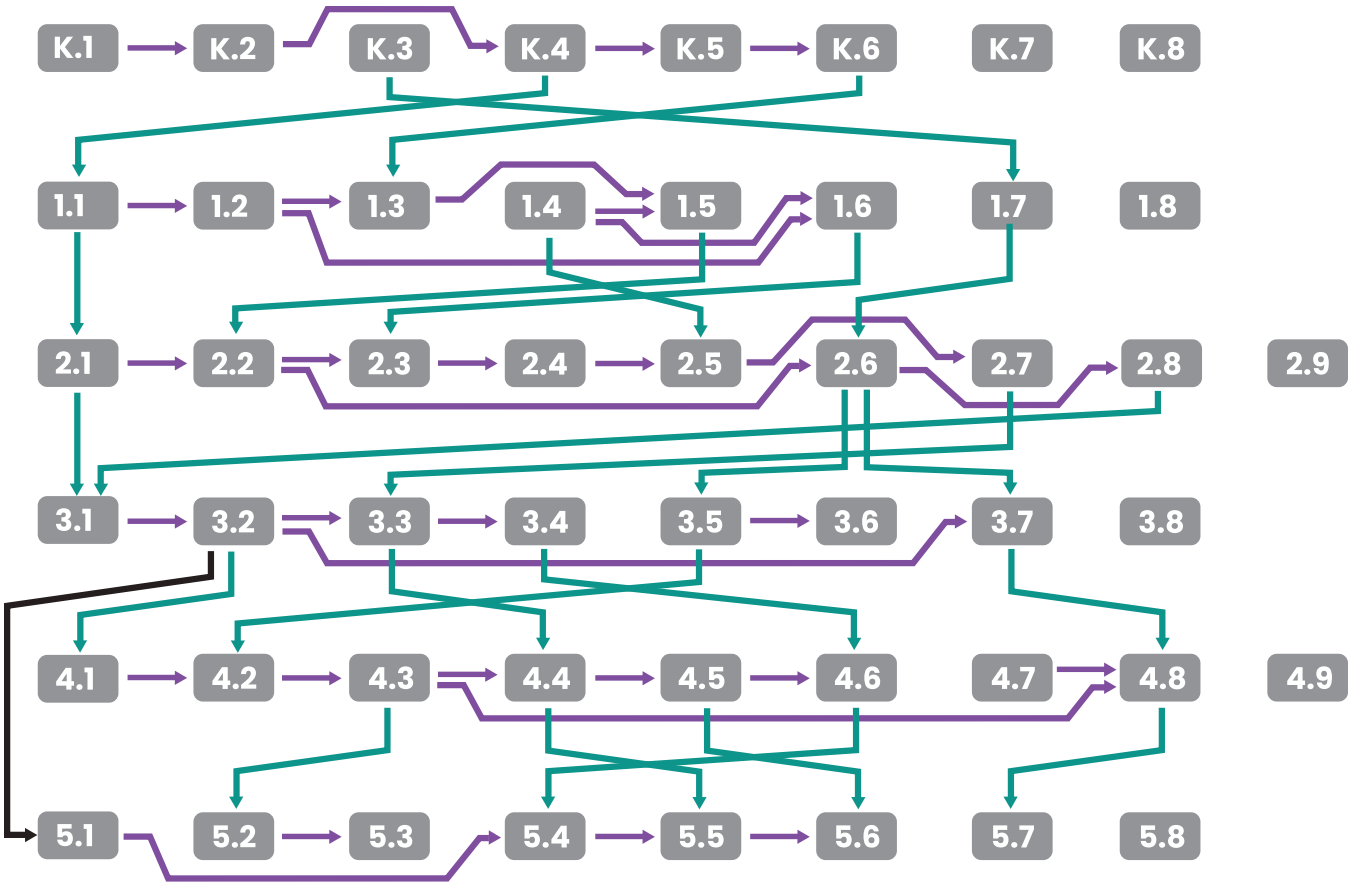
The number of days includes two assessment days per unit. The upper bound of the range includes optional lessons.

	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			

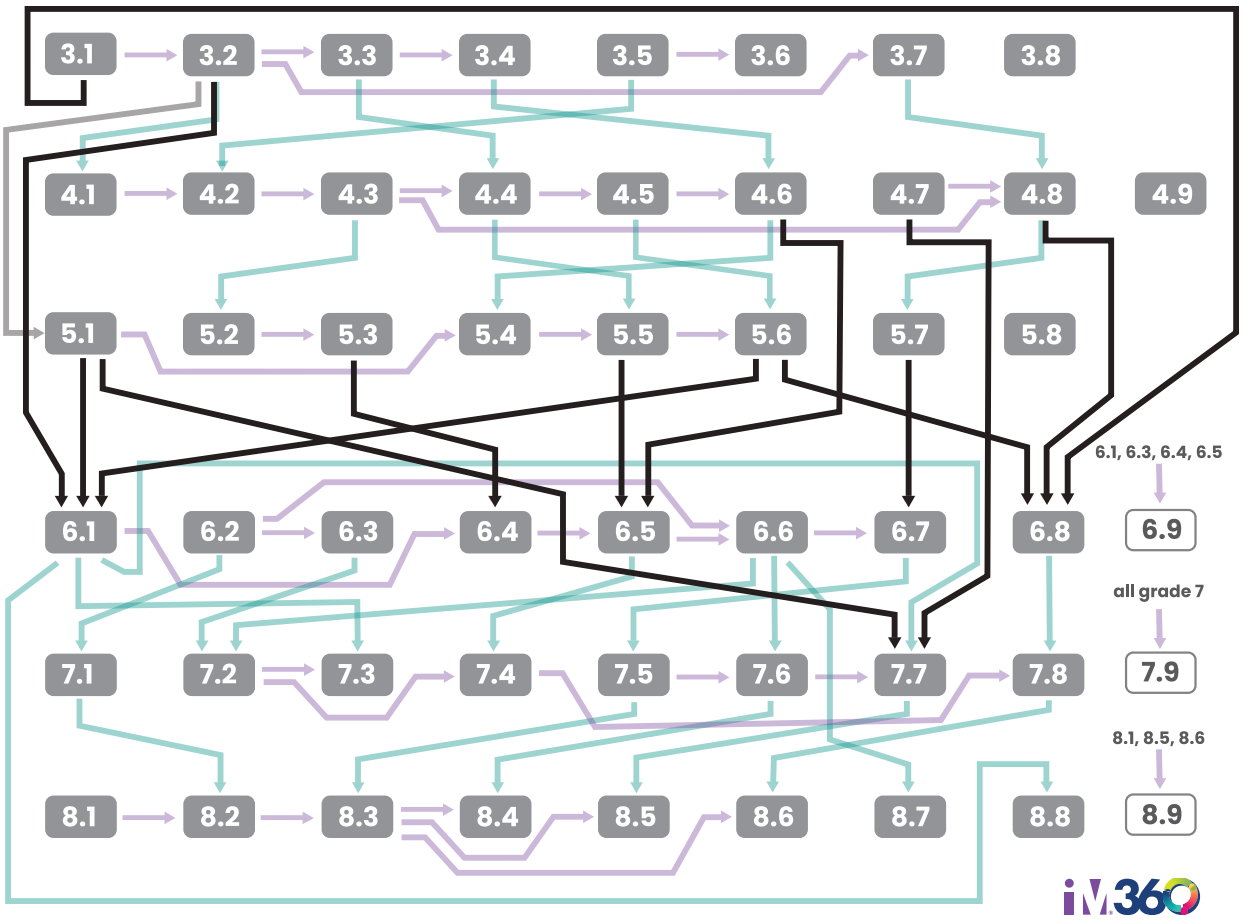
	Grade 3	Grade 4	Grade 5
week 1	Unit 1 Introducing Multiplication (22–23 days) Optional Lesson: 21	Unit 1 Factors and Multiples (8–10 days) Optional Lessons: 4, 8	Unit 1 Finding Volume (14–15 days) Optional Lesson: 12
week 2			
week 3		Unit 2 Fraction Equivalence and Comparison (18–19 days) Optional Lesson: 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.

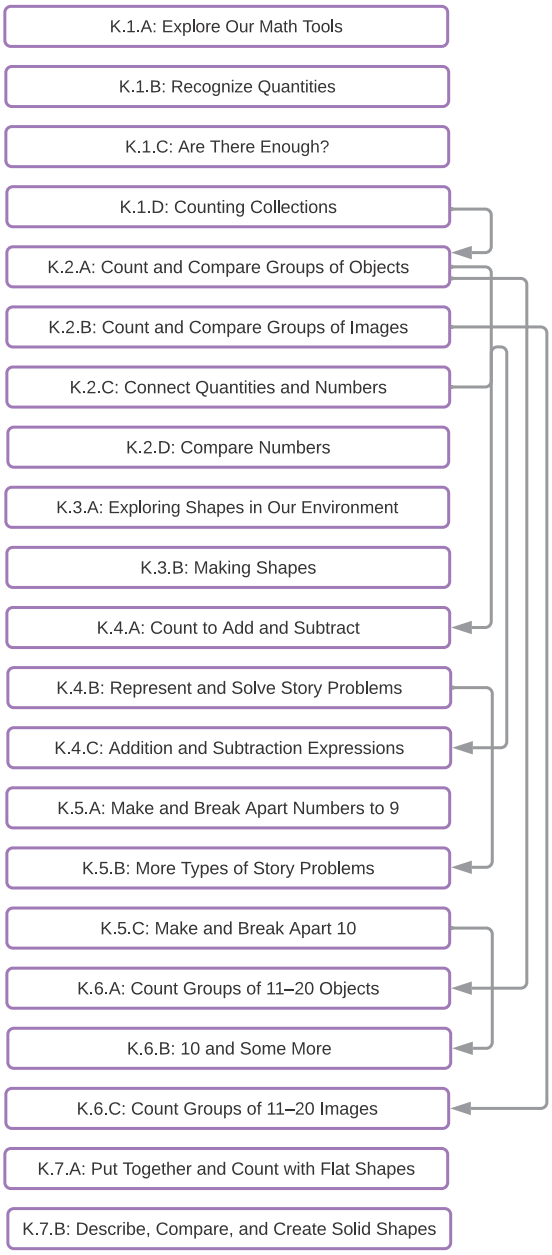


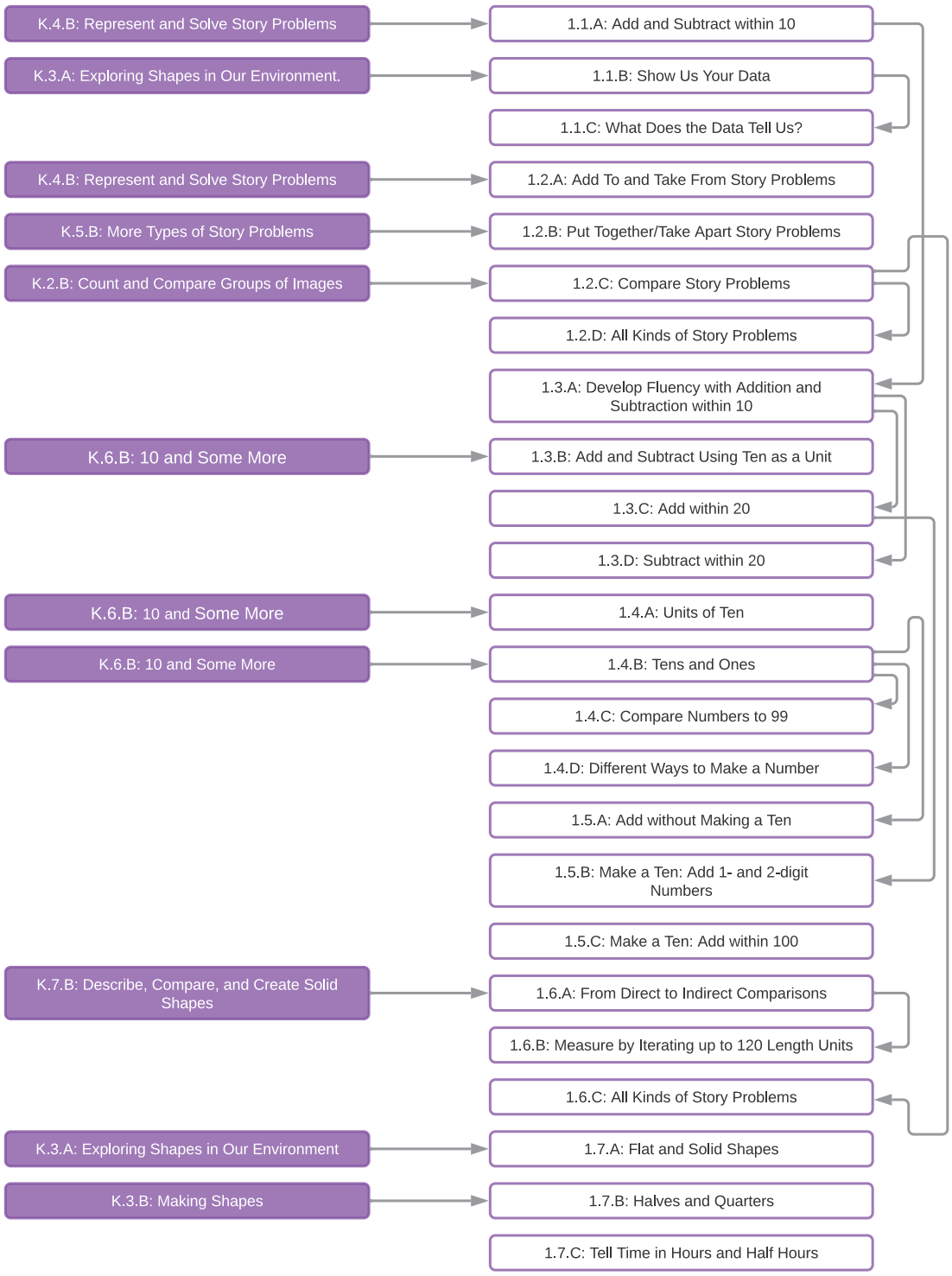
The following chart shows unit dependencies across the curriculum for IM Grades 3–8.

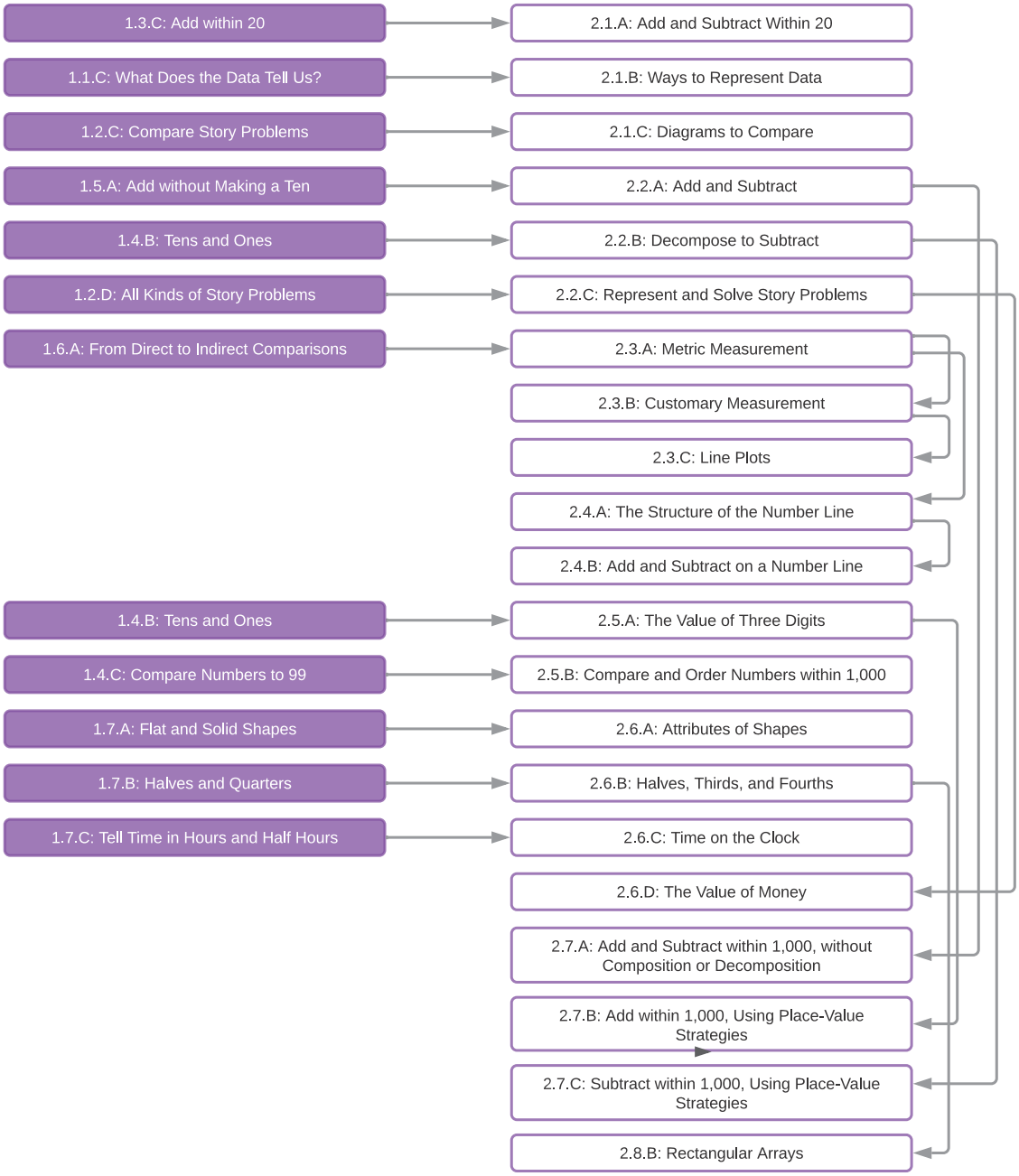


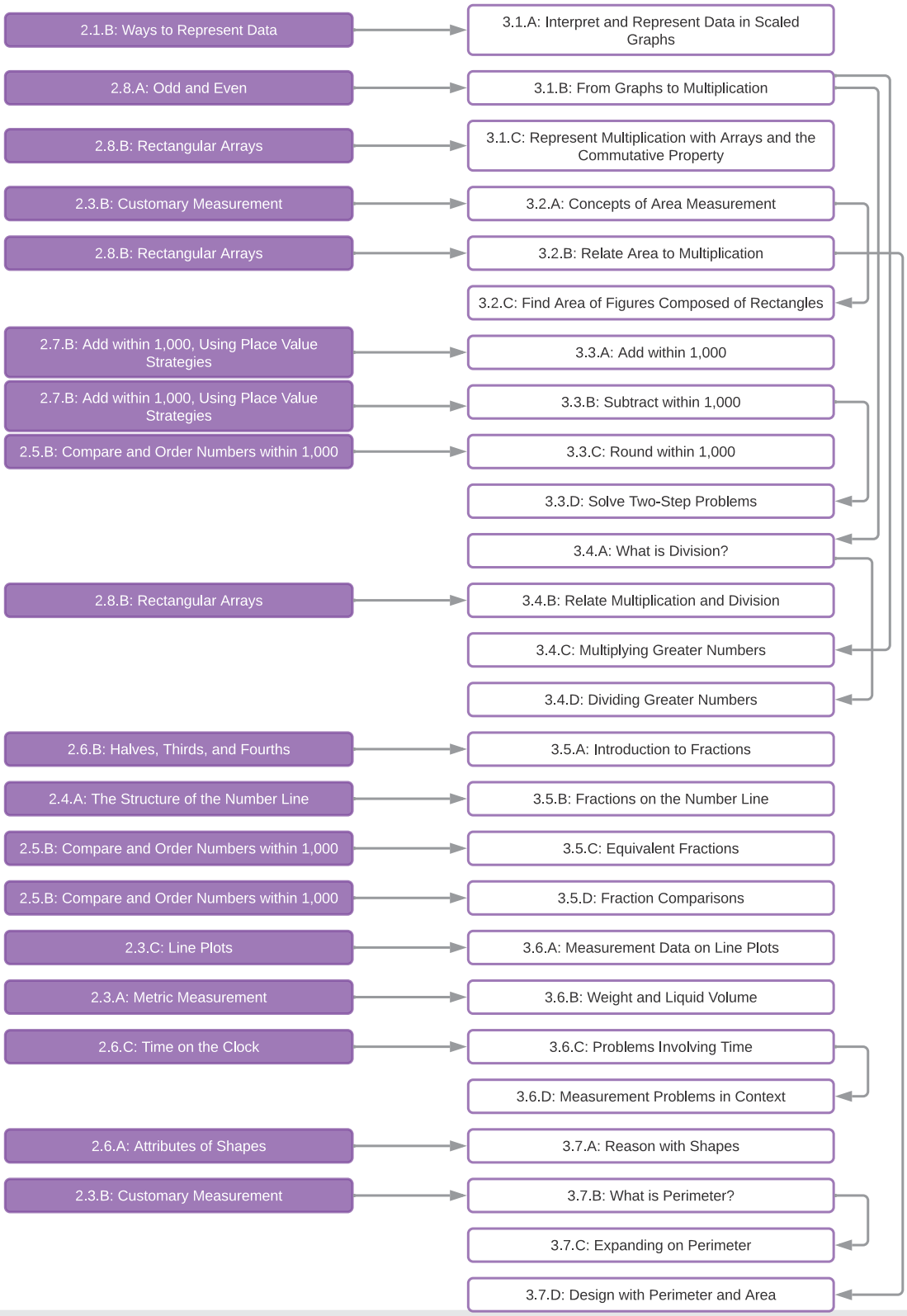
Section Dependency Diagrams

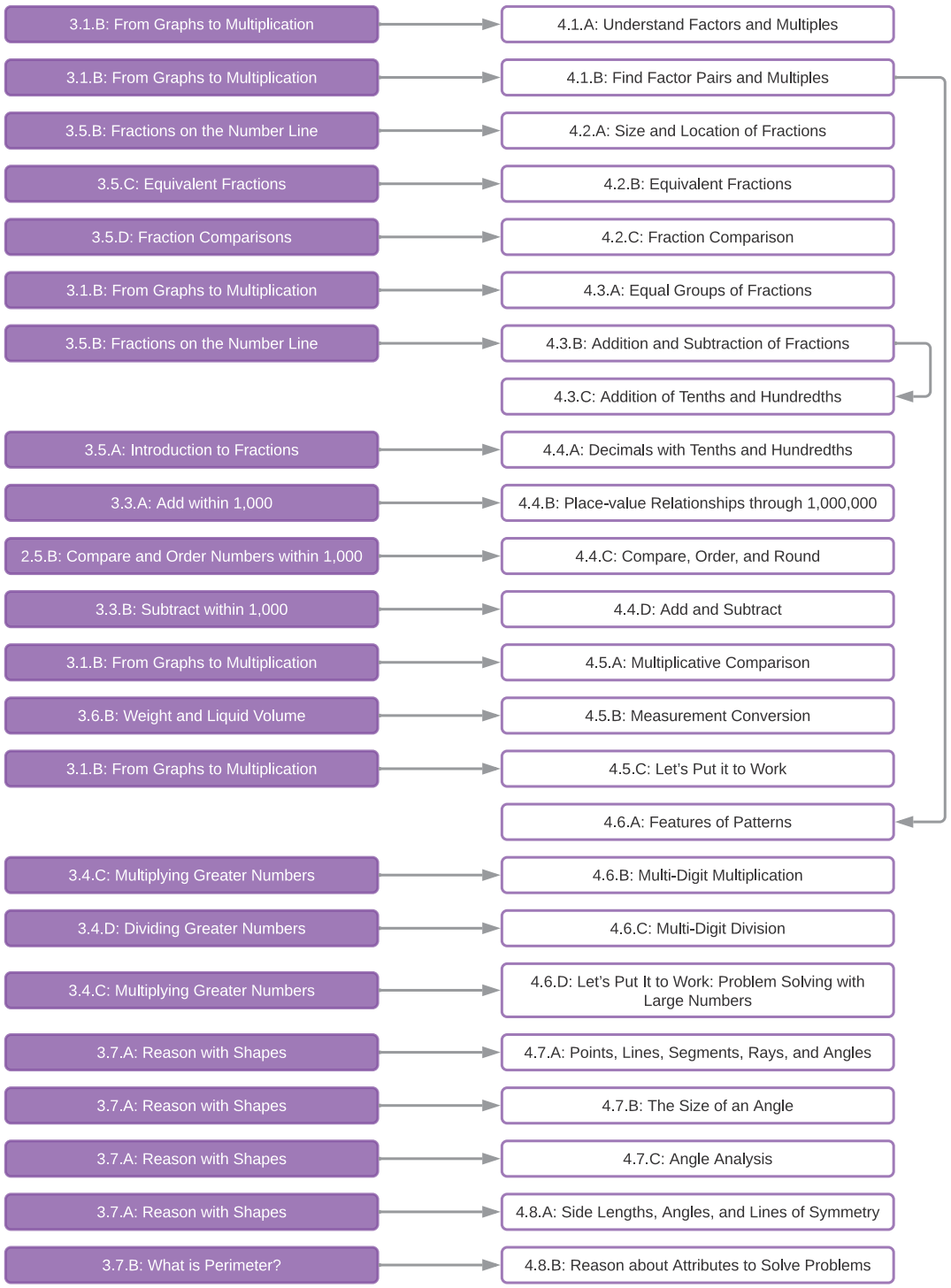
In the section dependency charts, an arrow indicates the prior section that contains content most directly designed to support or build toward the content in the current section.

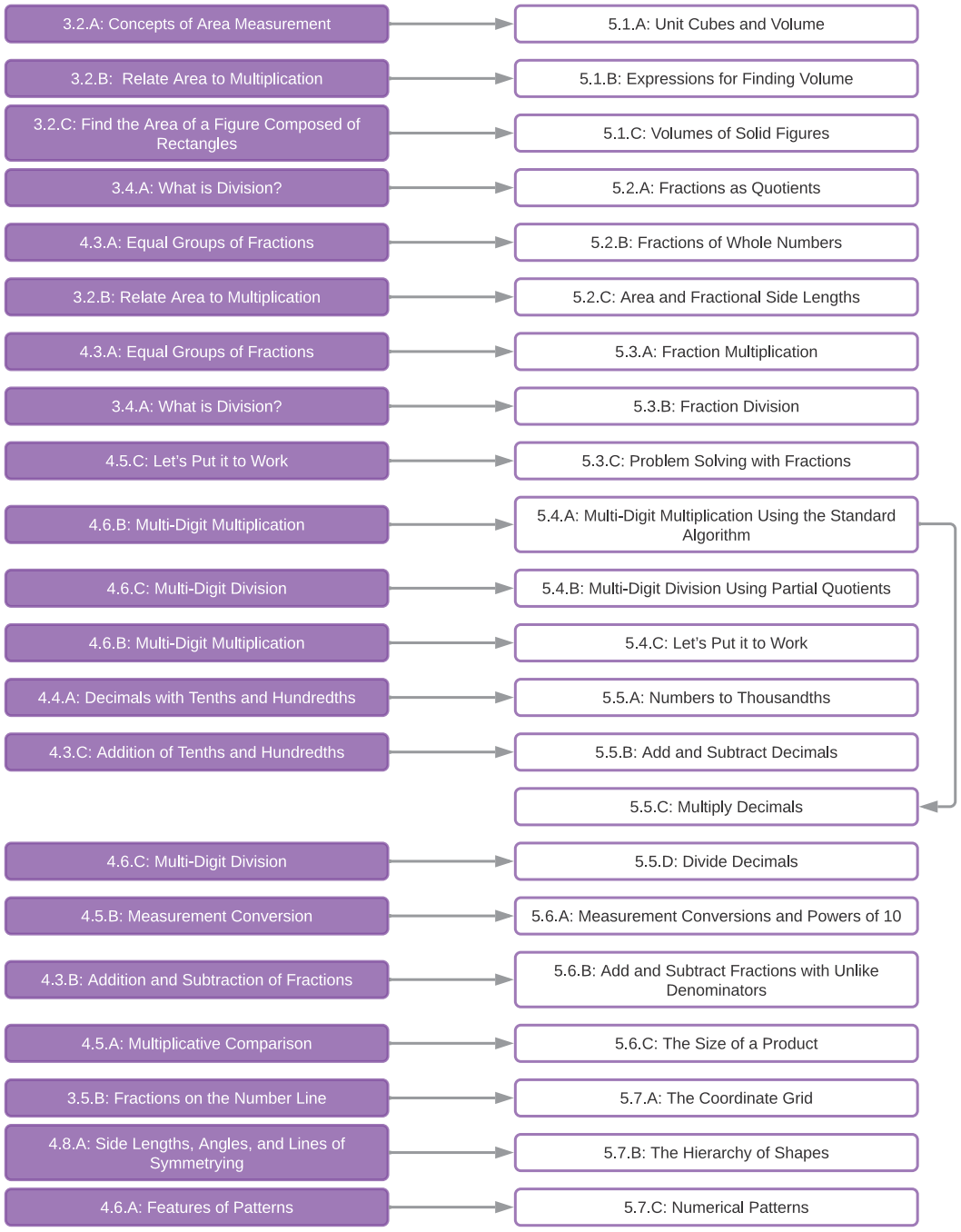

K.1.A: Explore Our Math Tools
K.1.B: Recognize Quantities
K.1.C: Are There Enough?
K.1.D: Counting Collections
K.2.A: Count and Compare Groups of Objects
K.2.B: Count and Compare Groups of Images
K.2.C: Connect Quantities and Numbers
K.2.D: Compare Numbers
K.3.A: Exploring Shapes in Our Environment
K.3.B: 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