

Scope and Sequence for Kindergarten

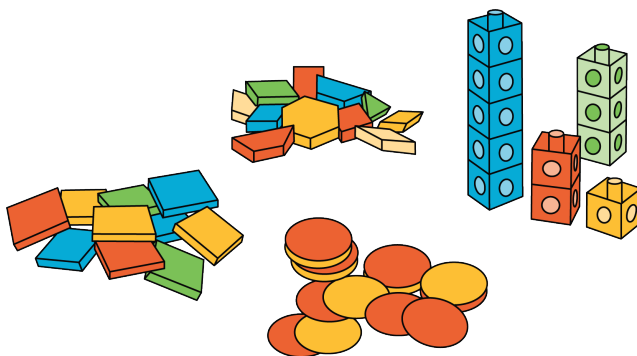
The big ideas in IM Kindergarten include: representing and comparing whole numbers, initially with sets of objects; understanding and applying addition and subtraction; and describing shapes and space. In IM Kindergarten, more time is devoted to numbers than to other topics. The materials, particularly units that focus on addition and subtraction, include problem types, such as Add To, Take From, Put Together or Take Apart, Compare, Result Unknown, and so on. These problem types are based on common addition and subtraction situations, as outlined in Table 1 of the “Mathematics Glossary” section of the *Common Core State Standards* (NGA & CCSSO).

Unit 1: Math in Our World

In this unit, students explore mathematical tools and notice numbers and quantities around them. Teachers gather information about students’ counting skills and understanding of number concepts.

Students enter kindergarten with a range of counting experiences, concepts, and skills. So, this unit is designed to be accessible to all learners regardless of their prior experience. In the first three sections, activities do not require counting, though students may choose to count. Students also have opportunities to work with math tools and topics related to geometry, measurement, and data through a variety of centers.

In the last section, students count collections of objects and groups of people to answer, “how many?” questions. These questions reinforce the idea that counting is a way to tell how many objects there are. Counting up to 10 objects will support students in the next unit, which will focus more deeply on numbers 1–10.



The content of this unit is designed to establish the structures and routines for centers, to create norms for classroom learning, and to begin building a mathematical community. In the first section, lessons are shorter to give students time to learn these routines and norms and to develop a mathematical community.

At different points throughout the unit, consider asking individual students to count a small group of objects. As the student works, observe the skills or understandings in the Checklist provided at the beginning of each section and in the Unit 1 Sections A–D Checkpoint document in the teacher resource packet. The end-of-unit assessment (a one-on-one interview) is another opportunity to find out what students know and can do. This assessment is not necessary for students who have demonstrated the skills on the checklist throughout the unit.

Section A: Explore Our Math Tools

- Lesson 1: Explore Connecting Cubes
- Lesson 2: Explore Pattern Blocks
- Lesson 3: Explore 2-Color Counters and 5-Frames
- Lesson 4: Explore Geoblocks
- Lesson 5: Explore Math Tools

Section B: Recognize Quantities

- Lesson 6: Look for Small Groups
- Lesson 7: Classroom Scavenger Hunt
- Lesson 8: Different Groups, Same Quantity
- Lesson 9: Create Picture Books

Section C: Are There Enough?

- Lesson 10: Are There Enough?
- Lesson 11: Get Enough

Section D: Counting Collections

- Lesson 12: How Many Are There? (Part 1)
- Lesson 13: How Many Are There? (Part 2)
- Lesson 14: Answer “How Many?” Questions
- Lesson 15: Explain How You Counted
- Lesson 16: Represent Our Collections
- Lesson 17: Model with Math Tools

Unit 2: Numbers 1–10

In this unit, students continue to develop counting concepts and skills, including comparing groups of objects and images, and representing quantities with objects, pictures, and numbers.

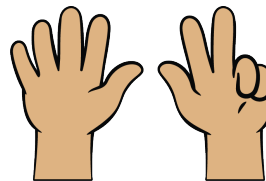
Previously, students learned structures and routines for activities and centers. They counted up to 10 objects to answer “how many?” questions. They also answered “are there enough?” questions—the basis of comparing quantities.

Here, students rely on familiar activity structures to build counting skills and an understanding of the connection between quantities and numbers. Students first count groups of objects. Then they count groups of images. Objects and images appear in different arrangements, such as lines, arrays, number cube patterns, and on 5-frames. This helps build an understanding that changing the arrangement doesn’t change the quantity.

Use of fingers and 5-frames to represent numbers are emphasized to help students see the structure of numbers 6–10 as $5 + n$. Fingers are also always available and help with counting.



These fingers show 3.



These fingers show 8.

Students also compare numbers of objects and images. To describe the comparisons, students start by using the terms “fewer” and “more.” Later, when comparing written numbers, the term “less” is introduced. In general, “less” is used to compare numerals, and “fewer” is used to compare groups of objects. Students may use these terms interchangeably at first, but they will develop proficiency with the distinction over time.

Section A: Count and Compare Groups of Objects

- Lesson 1: Fingers as a Math Tool

- Lesson 2: Count and Arrange
- Lesson 3: Groups That Look Very Different
- Lesson 4: Groups That Look Alike
- Lesson 5: Make Groups of More, Fewer, or the Same
- Lesson 6: Use “More,” “Fewer,” or “the Same Number” to Describe Groups
- Lesson 7: Write Numbers 1–5
- Lesson 8: Write Numbers 6–10

Section B: Count and Compare Groups of Images

- Lesson 9: Count Images in Different Arrangements
- Lesson 10: Compare Matching Images
- Lesson 11: More, Fewer, or the Same
- Lesson 12: Find More, Fewer, or the Same
- Lesson 13: Create Groups of Images

Section C: Connect Quantities and Numbers

- Lesson 14: Connect Quantities and Numbers
- Lesson 15: Numbers in Many Ways
- Lesson 16: Count Out Objects
- Lesson 17: Draw Groups of Things
- Lesson 18: Write Numbers to Represent Quantities

Section D: Compare Numbers

- Lesson 19: Order Towers and Numbers
- Lesson 20: 1 More or 1 Less with Towers and Numbers
- Lesson 21: Compare Numbers and Images
- Lesson 22: Represent and Compare Numbers
- Lesson 23: Compare Numbers
- Lesson 24: Set the Table

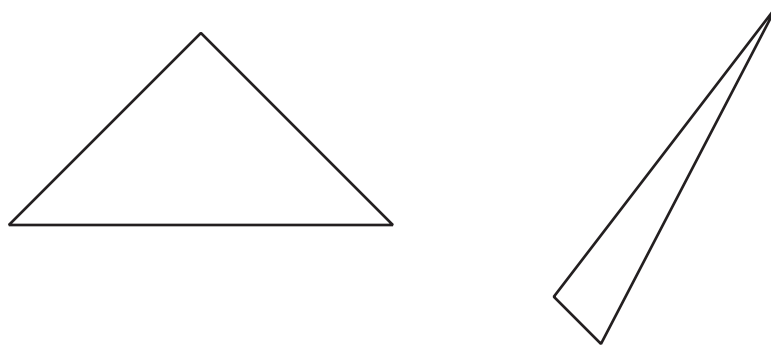
Unit 3: Flat Shapes All around Us

This unit introduces students to the foundational concepts of geometry, with a focus on familiar flat (two-dimensional) shapes.

Students may initially associate names of shapes with everyday objects. For example, a rectangle is a shape that looks like a door. Students need to see and interact with many examples of a shape to accurately relate objects in their environment to the geometric term.

For instance, students may say that only one of the two shapes is a triangle—the isosceles triangle sitting on its base—because they have seen examples like it referred to as triangles. They may not consider a scalene triangle sitting on a vertex as a part of the same shape category because, in their experience, a shape like it hasn’t been associated with the term “triangle.”





Students explore differences in shapes and use informal language to describe, compare, and sort them. Circle, triangle, rectangle, and square are four shapes that students study and name here. (They will not describe what defines each shape until grade 1.) Students also learn a key idea, that congruent shapes are still “the same” even if they are in different orientations.

Later in the unit, students use pattern blocks to make larger shapes. They reinforce their counting and comparison skills as they count and compare the pattern blocks used to create larger shapes. Students also use positional words (above, below, next to, beside) to describe the shapes they compose.

Section A: Exploring Shapes in Our Environment

- Lesson 1: What We Know about Shapes
- Lesson 2: Match Shapes
- Lesson 3: Describe and Compare Shapes
- Lesson 4: Describe, Compare, and Sort Shapes
- Lesson 5: Circles and Triangles
- Lesson 6: Rectangles and Squares
- Lesson 7: Build with Straws
- Lesson 8: Draw Shapes
- Lesson 9: Shapes Are Everywhere

Section B: Making Shapes

- Lesson 10: Put Together Pattern Blocks
- Lesson 11: Same Shapes
- Lesson 12: More than 1 Way to Make a Shape
- Lesson 13: Describe and Match Shapes
- Lesson 14: Shapes in Art
- Lesson 15: Animal Shape Stamp Art

Unit 4: Understanding Addition and Subtraction

In this unit, students develop their understanding of addition and subtraction as they represent and solve story problems.

Previously, students developed their counting skills. Students learn addition as an extension of counting through joining



two groups and counting to find the total. Students also extend their counting through subtraction. They count to find and remove objects within a collection and then count what remains. (The word “total” is used instead of “sum” to avoid confusion with the word “some” or part of a whole.)



Students then represent and solve Add To, Result Unknown and Take From, Result Unknown story problems. Students represent the problems in different ways, by acting them out, drawing, using numbers, or using objects. Connecting cubes and two-color counters should be made accessible in all lesson activities, including cool-downs, for students that want to use them throughout the unit.

Students are also introduced to expressions, a symbolic way to represent addition and subtraction. Initially, the teacher records the process of adding and subtracting using words such as “5 and 3” or “4 take away 1.” Later, students see that “5 and 3” and “4 take away 1” can be expressed by $5+3$ and $4-1$, respectively. They learn these expressions are read as “5 plus 3” and “4 minus 1.” Students are not expected to read expressions out loud or to use precise language at this point.

Later in the unit, students connect expressions to pictures and story problems. They find the value of addition and subtraction expressions within 10.

In a future unit, students will compose and decompose numbers up to 10 and solve other types of addition and subtraction problems.

Section A: Count to Add and Subtract

- Lesson 1: Count 2 Groups of Objects
- Lesson 2: Count 2 Groups of Images
- Lesson 3: Count 2 Groups of Scattered Images
- Lesson 4: Add with Objects
- Lesson 5: Subtract with Objects

Section B: Represent and Solve Story Problems

- Lesson 6: Tell and Act Out Stories
- Lesson 7: Use Objects to Represent Stories
- Lesson 8: Represent and Solve Story Problems
- Lesson 9: Solve Story Problems
- Lesson 10: Compare Drawings
- Lesson 11: Drawings to Represent Story Problems
- Lesson 12: Compare Addition and Subtraction Story Problems
- Lesson 13: Create Story Problems

Section C: Addition and Subtraction Expressions

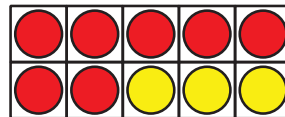
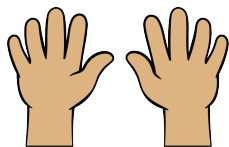
- Lesson 14: Expressions and Story Problems
- Lesson 15: Expressions and Drawings
- Lesson 16: Find the Value of Expressions
- Lesson 17: Add 0 and 1
- Lesson 18: Tell Story Problems for Expressions

Unit 5: Composing and Decomposing Numbers to 10

In this unit, students explore different ways to compose and decompose numbers within 10 and to represent the compositions and decompositions.

Previously, students counted and compared groups and images of up to 10 objects. Students solved addition and subtraction story problems and wrote expressions to represent the problems. In this unit, students use those experiences to compose and decompose numbers within 10. (The terms “make” or “break apart” are used with students.)

Special attention is given to composing and decomposing 10, as it is the basis of place value in our number system. To support their reasoning, students use their fingers and a 10-frame—created by putting together two 5-frames. They use these tools to think about pairs of numbers that make 10.



Symbolic notation develops slowly across the units. Students first complete expressions that represent numbers being composed and decomposed. They also practice writing numbers without handwriting lines.

Later, students encounter equations of the form $5 = 3 + 2$. Teachers read this equation as “5 is 3 plus 2.” Note that the equations are written with the total on the left side of the equal sign and the addends on the right. Aside from representing composition and decomposition, this notation helps students see that the equal sign means that “both sides have the same value,” rather than “the answer comes next.” In a later unit, students will see equations with the addends on the left side.

The work in this unit prepares students to make sense of teen numbers in the next unit and lays the groundwork for students to develop fluency with addition and subtraction facts within 10 in grade 1. (For example, to find the sum of $9 + 5$, they can decompose 5 into $1 + 4$ and find $9 + 1 + 4$ or $10 + 4$.) Much of the addition and subtraction work in future grades also hinges on the idea of composing and decomposing numbers, 10 in particular.

Section A: Make and Break Apart Numbers to 9

- Lesson 1: Make 2 Parts
- Lesson 2: Make and Break Apart Pattern Block Designs
- Lesson 3: Snap the Cubes
- Lesson 4: Find All the Ways

Section B: More Types of Story Problems

- Lesson 5: Put Together
- Lesson 6: Red and Yellow Apples

- Lesson 7: Solve Both Addends In Unknown Story Problems
- Lesson 8: More than One Way
- Lesson 9: Story Problems

Section C: Make and Break Apart 10

- Lesson 10: Introduce the 10-Frame
- Lesson 11: Equations That Show 10
- Lesson 12: How Many Are Missing?
- Lesson 13: Make 10
- Lesson 14: Towers of 10
- Lesson 15: Packing Up Fruit

Unit 6: Numbers 0–20

In this unit, students count and represent collections of objects and images within 20. They apply previously developed counting concepts, such as one-to-one correspondence, keeping track of what has been counted, and conservation of numbers, to larger numbers.

Previously, students counted, composed, and decomposed numbers up to 10. They used counters, connecting cubes, 5-frames, 10-frames, drawings, their fingers, and other tools. They also wrote expressions to record compositions and decompositions.

Here, students use the 10-frame to organize groups of 11–19 objects and images. This tool encourages students to see teen numbers as 10 and some more, emphasizing the $10 + n$ structure of the numbers 11–19. Students use this structure as they represent teen numbers with their fingers, objects, drawings, expressions, and equations. Students see equations with the addends written first, such as $10 + 6 = 16$. It is important to note that students are not expected to think of 10 ones as a unit called “a ten” or refer to single units as “ones” until Grade 1.



Throughout the unit, students practice tracing and writing numbers 11–20. It is common for students at this stage to write numbers backwards, so the emphasis is on writing a number that is recognizable to others. Reversing the order of the digits of teen numbers is also expected, due to how teen numbers are said in English. Repeatedly seeing the number 1 written first to represent teen numbers helps students recognize the structure of these numbers.

When tracing and writing numbers, students should write on a flat surface while sitting in a chair with feet flat on the floor. Number writing practice can also happen in other parts of the day and can be done using a variety of writing tools (crayons, colored pencils, markers, and so on) for increased engagement. Students can practice creating numbers with dough, tracing numbers in sand, or forming numbers with pipe cleaners.

Section A: Count Groups of 11–20 Objects

- Lesson 1: Count Larger Collections of Objects
- Lesson 2: Keep Track of Objects
- Lesson 3: Count Carefully
- Lesson 4: Does the Number Change?

Section B: 10 and Some More

- Lesson 5: How Many Fingers? How Many Dots?
- Lesson 6: Fingers and 10-Frames
- Lesson 7: Make Numbers with 10 and Some More (Part 1)
- Lesson 8: Make Numbers with 10 and Some More (Part 2)
- Lesson 9: Expressions and Equations
- Lesson 10: Complete Equations

Section C: Count Groups of 11–20 Images

- Lesson 11: Count Images (Part 1)
- Lesson 12: Count Images (Part 2)
- Lesson 13: Design a Garden

Unit 7: Solid Shapes All around Us

In this unit, students explore solid shapes while reinforcing their knowledge of counting, number writing and comparison, and flat shapes. They compose figures with pattern blocks and continue to count up to 20 objects, write and compare numbers, and solve story problems.

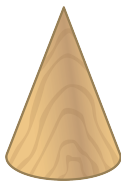
In an earlier unit, students investigated two-dimensional shapes. They named shapes (circle, triangle, rectangle, and square) and described the ways the shapes are different. Students used pattern blocks to build larger shapes and used positional words (above, below, next to, beside) along the way.

Here, students distinguish between flat and solid shapes before focusing on solid shapes. They consider the weights and capacities of solid objects and identify solid shapes around them.

Geoblocks, connecting cubes, and everyday objects are used throughout the unit. Standard geoblock sets do not include cylinders, spheres, and cones. When these shapes are required, “solid shapes” are indicated as required materials. If solid shapes are not available, students can work with everyday items that represent each shape.

The mathematical names **cube**, **cone**, **sphere**, and **cylinder** are introduced in this unit; however, students are not expected to use the names of solid shapes. Students can and are encouraged to continue to use their own language to describe and identify solid shapes.

3 cones



4 cubes



5 cylinders



How many shapes did you use all together?

The work here prepares students to identify defining attributes of shapes and to use flat and solid shapes to create composite shapes in grade 1.

Section A: Put Together and Count with Flat Shapes

- Lesson 1: Build Shapes
- Lesson 2: More or Fewer Pattern Blocks

- Lesson 3: Questions and Stories about Shapes
- Lesson 4: Pattern Block Puzzles and Equations
- Lesson 5: Story Problems about Shapes
- Lesson 6: Make and Break Apart 10 with Pattern Blocks

Section B: Describe, Compare, and Create Solid Shapes

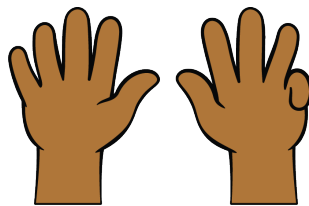
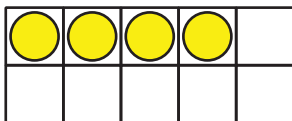
- Lesson 7: Flat and Solid Shapes
- Lesson 8: Compare Weights
- Lesson 9: Compare Capacities
- Lesson 10: Identify and Describe Solid Shapes
- Lesson 11: Compare and Sort Solid Shapes
- Lesson 12: Build Solid Shapes
- Lesson 13: Describe Solid Shapes around Us
- Lesson 14: Build with Solid Shapes
- Lesson 15: Build and Count with Solid Shapes
- Lesson 16: Represent the Classroom with Shapes

Unit 8: Putting It All Together

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

Section A focuses on the concepts of counting and comparing. Section B highlights the presence of math in students' school community. Section C enables students to practice composing and decomposing numbers within 5, as well as adding and subtracting within 5. Section D focuses on composing and decomposing 10.

The sections in this unit are standalone sections, not required to be completed in order. 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.



$$10 = \underline{8} + \underline{2}$$

The content here lays the foundation for grade 1, where students add and subtract fluently within 10 and count and compare larger quantities. Students also learn about "ten" as a unit, which is the basis for understanding place value in the base-ten system.

Section A: Counting and Comparing

- Lesson 1: Sort, Count, and Compare Groups of Objects
- Lesson 2: Count and Compare Collections
- Lesson 3: Count to Add and Subtract
- Lesson 4: 1 More and 1 Less

- Lesson 5: Order Numbers 1–20

Section B: Math in Our School

- Lesson 6: Create Number Books (Part 1)
- Lesson 7: Create Number Books (Part 2)
- Lesson 8: Find Someone Who, Find Something That
- Lesson 9: Where's the Math?
- Lesson 10: Tell Stories about Our School
- Lesson 11: Share Story Problems

Section C: Fluency within 5

- Lesson 12: Make Dot Images
- Lesson 13: Dominoes to 5
- Lesson 14: Sort and Color Expressions and Images within 5
- Lesson 15: Addition and Subtraction Expressions within 5
- Lesson 16: Parts to Make 5

Section D: All about 10

- Lesson 17: Make and Break Apart 10
- Lesson 18: All the Ways to Make 10
- Lesson 19: Find the Number That Makes 10
- Lesson 20: More or Fewer than 10?
- Lesson 21: Make and Break Apart Numbers 11–19

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



