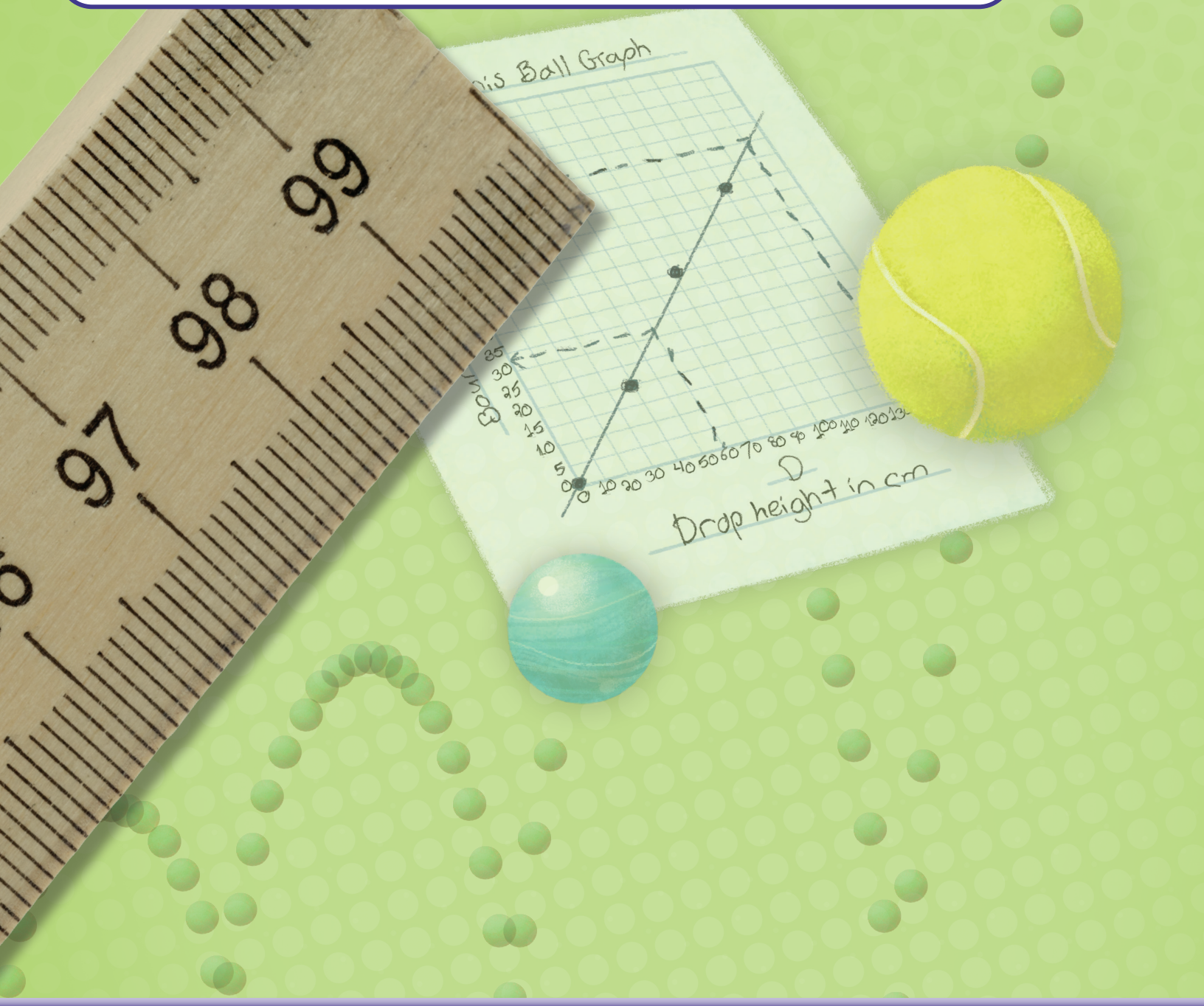
Learning Progression Grade 4

Math Trailblazers®

Fourth Edition



Kendall Hunt Publishing Company

Math Trailblazers®

Common Core State Standards

Math Trailblazers Grade 4 Learning Progression

Program Scope and Sequence

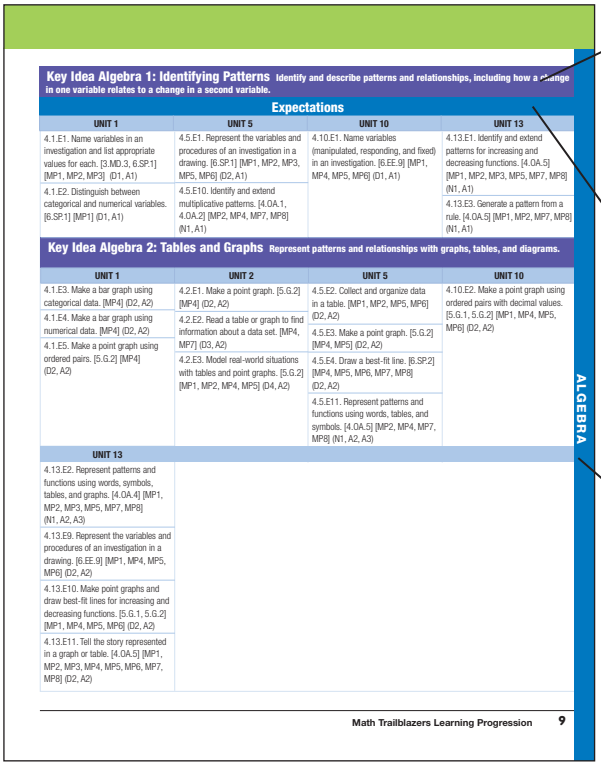
Kendall Hunt

TIMS® MATH SCIENCE

A TIMS® CURRICULUM

University of Illinois at Chicago

The Learning Progression outlines the Key Ideas that guide the Math Trailblazers® program. These Key Ideas fall within five strands: Number, Algebra, Geometry, Measurement, and Data. Each Key Idea is listed, followed by a chart that details each unit that addresses that Key Idea. Under each unit number is a list of the specific Math Trailblazers Expectations that correlate with the larger Key Idea. Expectations are also correlated with Common Core State Standards for Mathematics, Standards for Mathematical Practice, and mathematical strands. Together, these elements provide a comprehensive Scope and Sequence for the Math Trailblazers curriculum.



Key Idea Algebra 1: Identifying Patterns Identify and describe patterns and relationships, including how a change in one variable relates to a change in a second variable.

Expectations

UNIT 1	UNIT 5	UNIT 10	UNIT 13
4.1.E1. Name variables in an investigation and list appropriate values for each. [3.MD.3, 6.SP.1] [MP1, MP2, MP3] (D1, A1)	4.5.E1. Represent the variables and procedures of an investigation in a drawing. [6.SP.1] [MP1, MP2, MP3, MP5, MP6] (D2, A1)	4.10.E1. Name variables (manipulated, responding, and fixed) in an investigation. [6.EE.9] [MP1, MP4, MP5, MP6] (D1, A1)	4.13.E1. Identify and extend patterns for increasing and decreasing functions. [4.OA.5] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A1)
4.1.E2. Distinguish between categorical and numerical variables. [6.SP.1] [MP1] (D1, A1)	4.5.E10. Identify and extend multiplicative patterns. [4.OA.1, 4.OA.2] [MP2, MP4, MP7, MP8] (N1, A1)		4.13.E3. Generate a pattern from a rule. [4.OA.5] [MP1, MP2, MP7, MP8] (N1, A1)

Key Idea Algebra 2: Tables and Graphs Represent patterns and relationships with graphs, tables, and diagrams.

UNIT 1	UNIT 2	UNIT 5	UNIT 10
4.1.E3. Make a bar graph using categorical data. [MP4] (D2, A2)	4.2.E1. Make a point graph. [5.G.2] [MP4] (D2, A2)	4.5.E2. Collect and organize data in a table. [MP1, MP2, MP5, MP6] (D2, A2)	4.10.E2. Make a point graph using ordered pairs with decimal values. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.1.E4. Make a bar graph using numerical data. [MP4] (D2, A2)	4.2.E2. Read a table or graph to find information about a data set. [MP4, MP7] (D3, A2)	4.5.E3. Make a point graph. [5.G.2] [MP4, MP5] (D2, A2)	
4.1.E5. Make a point graph using ordered pairs. [5.G.2] [MP4] (D2, A2)	4.2.E3. Model real-world situations with tables and point graphs. [5.G.2] [MP1, MP2, MP4, MP5] (D4, A2)	4.5.E4. Draw a best-fit line. [6.SP.2] [MP4, MP5, MP6, MP7, MP8] (D2, A2)	
		4.5.E11. Represent patterns and functions using words, tables, and symbols. [4.OA.5] [MP2, MP4, MP7, MP8] (N1, A2, A3)	

UNIT 13
4.13.E2. Represent patterns and functions using words, symbols, tables, and graphs. [4.OA.4] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A2, A3)
4.13.E9. Represent the variables and procedures of an investigation in a drawing. [6.EE.9] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E10. Make point graphs and draw best-fit lines for increasing and decreasing functions. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E11. Tell the story represented in a graph or table. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D2, A2)

ALGEBRA

Math Trailblazers Learning Progression 9

- Key Idea: Every grade of the Math Trailblazers program is designed around the same set of Key Ideas. These Key Ideas appear as horizontal headers in the Learning Progression.
- Expectations: Expectations are listed by unit under the Key Ideas. These Expectations correlate with Key Ideas, but are more specific to the content taught in the listed unit
- Mathematical Strand: The Learning Progression is organized by mathematical strands, which are color-coded and listed vertically along the edge of each page

- Correlations: Each Expectation includes a list of codes indicating the correlations to the Common Core State Standards, the Standards for Mathematical Practice, and the mathematical strands.

4.11.E1. Demonstrate understanding of the place value concepts and mathematical properties involved in multiplication of 2-digit by 2-digit numbers (e.g., use the distributive property to multiply). [4.NBT.1, 4.NBT.5] [MP1, MP2, MP3, MP6] (N2, A4)

- Common Core State Standards
- Standards for Mathematical Practice
- Mathematical strands, numbered by Key Ideas

GRADE 4

Students develop mental math strategies, conceptual models, and standard algorithms for multidigit multiplication and division. They extend the rectangular array model and use graphs and tables to reason with multiplication and division. Through problem solving, students deepen their understanding of and flexibility with large numbers and addition and subtraction operations. Students develop models for comparing, finding equivalence, and adding, subtracting, and multiplying fractions by using and connecting multiple representations. Students describe, analyze, and classify lines, angles, and polygons using their properties.

Key Idea Number 1: Number Sense Understand the base-ten number system, recognize relationships among quantities and numbers, and represent numbers in multiple ways.

Expectations

UNIT 3	UNIT 4	UNIT 5	UNIT 6
4.3.E1. Represent and solve multiplication and division problems using rectangular arrays. [4.NBT.5, 4.NBT.6] [MP1, MP2, MP3] (N1)	4.4.E1. Show that different partitions of the same number are equal using base-ten pieces, number lines, and number sentences (e.g., 200 + 30 + 7 = 200 + 20 + 17). [4.NBT.1, 4.NBT.2] [MP1, MP2, MP3, MP7] (N1, A3)	4.5.E10. Identify and extend multiplicative patterns. [4.OA.1, 4.OA.2] [MP2, MP4, MP7, MP8] (N1, A1)	4.6.E1. Read and write large numbers (to the millions). [4.NBT.2] [MP2] (N1)
4.3.E2. Determine whether one number is a multiple of another number. [4.OA.4] [MP2, MP8] (N1)		4.5.E11. Represent patterns and functions using words, tables, and symbols. [4.OA.5] [MP2, MP4, MP7, MP8] (N1, A2, A3)	4.6.E2. Compare and order large numbers (to the millions). [4.NBT.2] [MP2] (N1)
4.3.E3. Find the factors of a number. [4.OA.4] [MP2, MP8] (N1)			4.6.E3. Represent large numbers (to the millions) using place value charts, number lines, and number sentences (e.g., 10,705 = 10,000 + 700 + 5). [4.NBT.2] [MP2, MP3] (N1, A3)
4.3.E4. Identify prime numbers. [4.OA.4] [MP2, MP8] (N1)			4.6.E4. Make connections between place value concepts and representations of numbers (to one million) with base-ten pieces, number lines, expanded form, and standard form. [4.NBT.1] (N1)
4.3.E5. Identify square numbers. [4.OA.4] [MP2, MP8] (N1)			4.6.E5. Use patterns to make predictions and generalizations. [4.OA.5] [MP1, MP2, MP3, MP7] (N1, A4)
4.3.E6. Find the prime factorization of a number. [4.OA.4, 6.EE.1] [MP1, MP2, MP8] (N1)			4.6.E6. Round quantities to benchmark numbers. [4.NBT.3] (N1)
			4.6.E7. Estimate quantities. [4.NBT.3] [MP1, MP6] (N1)

Key Idea Number 1: Number Sense *continued*

Expectations

UNIT 7	UNIT 8	UNIT 10	UNIT 13
4.7.E1. Use divisibility rules to identify factors and multiples. [4.OA.4] [MP1, MP2, MP3, MP7] (N1)	4.8. E1. Represent fractions using area models (circle pieces, fraction strips, drawings) and number lines. [3.NF.2] [MP1, MP2, MP4, MP7] (N1)	4.10.E5. Represent decimals using area models, number lines, and base-ten pieces. [4.NF.5, 4.NF.6] [MP1, MP2, MP3] (N1)	4.13.E1. Identify and extend patterns for increasing and decreasing functions. [4.OA.5] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A1)
	4.8.E2. Use words and numbers to name fractions. [3.G.2] [MP1, MP6] (N1)	4.10.E6. Use words and numbers to read and write decimals to the hundredths. [4.NF.5, 4.NF.6] [MP1, MP3, MP6] (N1)	4.13.E2. Represent patterns and functions using words, symbols, tables, and graphs. [4.OA.4] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A2, A3)
	4.8.E3. Recognize that the same fractional parts of different-sized wholes are not equal. [4.NF.2] [MP1, MP2, MP3, MP4] (N1)	4.10.E7. Make connections among representations of decimals including symbols, words, area models, base-ten pieces, and number lines. [4.NF.5, 4.NF.6] [MP1, MP3, MP5, MP6] (N1)	4.13.E3. Generate a pattern from a rule. [4.OA.5] [MP1, MP2, MP7, MP8] (N1, A1)
	4.8.E4. Identify the unit whole when given a fractional part of a whole. [4.NF.1, 4.NF.2] [MP1, MP2, MP3] (N1)	4.10.E8. Compare and order decimals to the hundredths using models. [4.NF.7] [MP1, MP2, MP5, MP7] (N1)	
	4.8.E5. Name and represent fractions greater than one as mixed numbers and improper fractions using models (fraction strips, circle pieces, number lines). [3.NF.3C] [MP1, MP2, MP4] (N1)		
	4.8.E6. Write number sentences from area models of fractions (e.g., $\frac{1}{2} = \frac{3}{6}, \frac{1}{3} + \frac{1}{3} = \frac{2}{3}, \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{1}{3}$ x 3). [4.NF.3] [MP1, MP2, MP4, MP7] (N1, A3)		
	4.8.E7. Make connections among representations of fractions including symbols, words, area models, and number lines. [4.NF.1, 4.NF.2] [MP1, MP2, MP4, MP5] (N1)		
	4.8.E8. Find equivalent fractions using area models (circle pieces, fraction strips, drawings) and multiplication and division strategies. [4.NF.1, 4.NF.2, 4.NF.4] [MP1, MP3, MP5, MP7] (N1)		
	4.8.E9. Compare and order fractions using area models, number lines, and one-half as a benchmark. [4.NF.2] [MP1, MP2, MP3] (N1)		

Key Idea Number 2: Operations Understand the meaning of numerical operations and their application for solving problems.

Expectations

UNIT 3	UNIT 4	UNIT 6	UNIT 7
4.3.E7. Solve multiplication problems using 0 and 1 as factors (applying the multiplication properties of 0 and 1). [4.OA.3, 4.NBT.5] [MP1, MP2] (N2, A4)	4.4.E2. Represent and solve addition problems using base-ten pieces and number lines. [4.NBT.2, 4.NBT.4] [MP1, MP2] (N2)	4.6.E8. Solve division problems involving zero and justify solutions. [4.NBT.6] [MP2, MP3] (N2)	4.7.E2. Multiply numbers that are multiples of ten. [4.NBT.1] [MP1, MP2, MP4, MP6] (N2)
4.3.E8. Use turn-around facts to solve multiplication problems (applying the commutative property of multiplication). [4.NBT.5] [MP1, MP2] (N2, A4)	4.4.E3. Represent and solve subtraction problems using base-ten pieces and number lines. [4.NBT.2, 4.NBT.4] [MP1, MP2, MP3] (N2)		4.7.E3. Demonstrate understanding of the place value concepts and mathematical properties involved in operations with multidigit numbers (e.g., use the distributive property to multiply). [4.NBT.4, 4.NBT.5] [MP1, MP2, MP6] (N2, A4)
4.3.E9. Break products into the sum of simpler products to solve multiplication problems (applying the distributive property of multiplication over addition). [4.NBT.5] [MP1, MP2, MP3] (N2, A4)	4.4.E4. Solve addition and subtraction problems using mental math strategies (e.g., composing and decomposing numbers, counting up, and counting back). [4.NBT.4] [MP1, MP2, MP3] (N2)		4.7.E4. Show connections between models and strategies for multiplication (e.g., demonstrate partial products using a rectangle model for multiplication). [4.NBT.5] [MP1, MP4] (N2)
	4.4.E5. Solve multiplication problems using mental math strategies (e.g., composing and decomposing numbers and doubling and halving). [4.NBT.5] [MP1, MP2, MP7] (N2)		

UNIT 8	UNIT 9	UNIT 10	UNIT 11
4.8.E10. Add and subtract fractions with like denominators using area models. [4.NF.3] [MP1, MP2, MP4, MP5] (N2)	4.9. E1. Use addition and subtraction to find unknown angles. [4.MD.7] [MP1, MP2, MP3, MP5] (N2, A3, A4)	4.10.E9. Add and subtract decimals to the hundredths using models. [5.NBT.7] [MP1, MP2, MP6] (N2)	4.11.E1. Demonstrate understanding of the place value concepts and mathematical properties involved in multiplication of 2-digit by 2-digit numbers (e.g., use the distributive property to multiply). [4.NBT.1, 4.NBT.5] [MP1, MP2, MP3, MP6] (N2, A4)
4.8.E11. Multiply fractions by a whole number (e.g., $\frac{1}{3} \times 3 = 1$, $\frac{2}{3} \times 6 = \frac{1}{3} \times 6 \times 2$). [4.NF.4] [MP1, MP2, MP4, MP5] (N2, A4)			

Key Idea Number 2: Operations *continued*

Expectations

UNIT 12	UNIT 13	
4.12.E1. Demonstrate understanding of division of multidigit numbers by 1-digit numbers using models. [4.NBT.6] [MP1, MP2, MP4, MP5] (N2)	4.13.E4. Solve problems involving volume and mass. [4.MD.1] [MP1, MP2, MP3, MP5, MP7, MP8] (N2)	
4.12.E2. Show connections between models and strategies for multidigit division. [4.NBT.6] [MP1, MP2, MP4, MP5] (N2)		
4.12.E3. Show connections between multiplication and division (e.g., fact families, using multiplication to divide). [4.NTB.6] [MP1, MP2] (N2, A4)		
4.12.E4. Interpret remainders from division of multidigit numbers. [4.OA.3] [MP1, MP2, MP3, MP4, MP6] (N2)		

Key Idea Number 3: Computation and Estimation Use efficient and flexible procedures to compute accurately and make reasonable estimates.

Expectations

UNIT 1	UNIT 2	UNIT 3	UNIT 4
4.1.E11. Demonstrate fluency with the addition facts. (N3)	4.2.E8. Demonstrate fluency with the subtraction facts. [2.OA.2] (N3)	4.3.E10. Demonstrate fluency with the multiplication facts for the 5s, 10s, and square numbers. [3.OA.7] (N3)	4.4.E6. Add multidigit numbers using paper-and-pencil methods (expanded form, all partials, and compact). [4.NBT.4] [MP1, MP2] (N3)
		4.3.E11. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the 5s, 10s, and square numbers facts. [3.OA.7] (N3, A4)	4.4.E7. Subtract multidigit numbers using paper-and-pencil methods (expanded form and compact). [4.NBT.4] [MP1, MP2] (N3)
			4.4.E8. Multiply 2-digit numbers by 1-digit numbers using paper-and-pencil methods (expanded form, all partials, compact). [4.NBT.2, 4.NBT.5] [MP1, MP2] (N3)
			4.4.E9. Choose appropriately from among mental math, estimation, and paper-and-pencil methods to add and subtract whole numbers. [4.NBT.4] [MP6] (N3)
			4.4.E10. Choose appropriately between mental math and paper-and-pencil methods to multiply whole numbers. [4.NBT.5] [MP6] (N3)
			4.4.E11. Estimate sums and differences. [4.NBT.3, 4.OA.3] [MP3, MP6] (N3)
			4.4.E12. Demonstrate fluency with the multiplication facts for the 2s, 3s, and 9s. [3.OA.7] (N3)
			4.4.E13. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the 2s, 3s, and 9s facts. [3.OA.7] (N3, A4)

Key Idea Number 3: Computation and Estimation *continued*

Expectations

UNIT 5	UNIT 6	UNIT 7	UNIT 8
4.5.E12. Demonstrate fluency with the last six multiplication facts (4 x 6, 4 x 7, 4 x 8, 6 x 7, 6 x 8, 7 x 8). [3.OA.7] (N3)	4.6.E9. Estimate sums and differences for large numbers. [4.NBT.3] [MP1, MP3, MP6] (N3)	4.7.E5. Follow the order of operations. [5.OA.1] [MP1] (N3)	4.8.E12. Demonstrate fluency with the division facts for the 9s. [3.OA.7] (N3)
4.5.E13. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the last six facts. [3.OA.7] (N3, A4)	4.6.E10. Demonstrate fluency with the division facts for the 5s and 10s. [3.OA.7] (N3)	4.7.E6. Estimate products. [4.OA.3, 4.NBT.3] [MP1, MP2, MP6] (N3)	4.8.E13. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the 9s facts. [3.OA.4] (N3, A4)
	4.6.E11. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the 5s and 10s facts. [3.OA.4] (N3, A4)	4.7.E7. Multiply multidigit numbers by 1-digit numbers using mental math strategies and paper-and-pencil methods (e.g., expanded form, all-partials, compact). [4.OA.3, 4.NBT.5] [MP1, MP6] (N3)	
	4.6.E12. Demonstrate fluency with all the multiplication facts. [3.OA.7] (N3)	4.7.E8. Choose appropriately from among estimation, mental math strategies, and paper-and-pencil methods to multiply whole numbers. [4.OA.3, 4.OA.4, 4.NBT.5] [MP1, MP6] (N3)	
		4.7.E9. Demonstrate fluency with the division facts for the 2s and 3s. [3.OA.7] (N3)	
		4.7.E10. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the 2s and 3s facts. [3.OA.4] (N3, A4)	

Key Idea Number 3: Computation and Estimation *continued*

Expectations

UNIT 9	UNIT 10	UNIT 11	UNIT 12
4.9.E13. Demonstrate fluency with the division facts for the square numbers. [3.OA.7] (N3)	4.10.E10. Demonstrate fluency with the division facts related to the last six multiplication facts (24 ÷ 4, 24 ÷ 6, 28 ÷ 4, 28 ÷ 7, 32 ÷ 4, 32 ÷ 8, 42 ÷ 6, 42 ÷ 7, 48 ÷ 6, 48 ÷ 8, 56 ÷ 7, 56 ÷ 8). [3.OA.7] (N3)	4.11.E3. Estimate products of multidigit numbers. [4.NTB.3, 4.NBT.5] [MP1, MP5, MP6] (N3)	4.12.E5. Estimate quotients for division of multidigit numbers by 1-digit numbers. [4.NBT.3] [MP1, MP2, MP6] (N3)
4.9.E14. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the square numbers facts. [3.OA.4] (N3, A4)	4.10.E11. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the last six facts. [3.OA.4] (N3, A4)	4.11.E4. Multiply 2-digit by 2-digit numbers using mental math strategies and paper-and-pencil methods (e.g., expanded form, all-partials). [4.NBT.1, 4.NBT.2, 4.NBT.5] [MP1, MP2, MP3] (N3)	4.12.E6. Divide numbers that are multiples of ten. [4.NBT.1] [MP1, MP2] (N3)
		4.11.E5. Multiply 2-digit by 2-digit numbers using the compact method. [4.NBT.5, 4.OA.3, 5.NBT.5] [MP1, MP2, MP3, MP6] (N3)	4.12.E7. Divide multidigit numbers by 1-digit divisors using paper and pencil. [4.NBT.6] [MP1, MP2, MP6] (N3)
		4.11.E6. Choose appropriately from among estimation, mental math strategies, and paper-and-pencil methods to multiply multidigit numbers. [3.G.5, 3.G.6, 3.G.7, 4.MD.3, 4.NBT.5, 4.OA.3, 5.NBT.5] [MP1, MP2, MP3, MP4, MP5, MP6] (N3)	4.12.E8. Demonstrate fluency with the division facts in all groups. [3.OA.7] (N3)
		4.11.E7. Demonstrate fluency with the division facts for the last six multiplication facts (24 ÷ 4, 24 ÷ 6, 28 ÷ 4, 28 ÷ 7, 32 ÷ 4, 32 ÷ 8, 42 ÷ 6, 42 ÷ 7, 48 ÷ 6, 48 ÷ 8, 56 ÷ 7, 56 ÷ 8). [3.OA.7] (N3)	
		4.11.E8. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the last six facts. [3.OA.4] (N3, A4)	

Key Idea Algebra 1: Identifying Patterns

Identify and describe patterns and relationships, including how a change in one variable relates to a change in a second variable.

Expectations

UNIT 1	UNIT 5	UNIT 10	UNIT 13
4.1.E1. Name variables in an investigation and list appropriate values for each. [3.MD.3, 6.SP.1] [MP1, MP2, MP3] (D1, A1)	4.5.E1. Represent the variables and procedures of an investigation in a drawing. [6.SP.1] [MP1, MP2, MP3, MP5, MP6] (D2, A1)	4.10.E1. Name variables (manipulated, responding, and fixed) in an investigation. [6.EE.9] [MP1, MP4, MP5, MP6] (D1, A1)	4.13.E1. Identify and extend patterns for increasing and decreasing functions. [4.OA.5] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A1)
4.1.E2. Distinguish between categorical and numerical variables. [6.SP.1] [MP1] (D1, A1)	4.5.E10. Identify and extend multiplicative patterns. [4.OA.1, 4.OA.2] [MP2, MP4, MP7, MP8] (N1, A1)		4.13.E3. Generate a pattern from a rule. [4.OA.5] [MP1, MP2, MP7, MP8] (N1, A1)

Key Idea Algebra 2: Tables and Graphs

Represent patterns and relationships with graphs, tables, and diagrams.

UNIT 1	UNIT 2	UNIT 5	UNIT 10
4.1.E3. Make a bar graph using categorical data. [MP4] (D2, A2)	4.2.E1. Make a point graph. [5.G.2] [MP4] (D2, A2)	4.5.E2. Collect and organize data in a table. [MP1, MP2, MP5, MP6] (D2, A2)	4.10.E2. Make a point graph using ordered pairs with decimal values. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.1.E4. Make a bar graph using numerical data. [MP4] (D2, A2)	4.2.E2. Read a table or graph to find information about a data set. [MP4, MP7] (D3, A2)	4.5.E3. Make a point graph. [5.G.2] [MP4, MP5] (D2, A2)	
4.1.E5. Make a point graph using ordered pairs. [5.G.2] [MP4] (D2, A2)	4.2.E3. Model real-world situations with tables and point graphs. [5.G.2] [MP1, MP2, MP4, MP5] (D4, A2)	4.5.E4. Draw a best-fit line. [6.SP.2] [MP4, MP5, MP6, MP7, MP8] (D2, A2)	
		4.5.E11. Represent patterns and functions using words, tables, and symbols. [4.OA.5] [MP2, MP4, MP7, MP8] (N1, A2, A3)	

UNIT 13
4.13.E2. Represent patterns and functions using words, symbols, tables, and graphs. [4.OA.4] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A2, A3)
4.13.E9. Represent the variables and procedures of an investigation in a drawing. [6.EE.9] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E10. Make point graphs and draw best-fit lines for increasing and decreasing functions. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E11. Tell the story represented in a graph or table. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D2, A2)

Key Idea Algebra 3: Symbols Represent patterns and relationships with symbols (includes using variables in formulas and as unknowns in equations).

Expectations

UNIT 4	UNIT 5	UNIT 6	UNIT 8
4.4.E1. Show that different partitions of the same number are equal using base-ten pieces, number lines, and number sentences (e.g., 200 + 30 + 7 = 200 + 20 + 17). [4.NBT.1, 4.NBT.2] [MP1, MP2, MP3, MP7] (N1, A3)	4.5.E11. Represent patterns and functions using words, tables, and symbols. [4.OA.5] [MP2, MP4, MP7, MP8] (N1, A2, A3) 4.5.E13. Determine the unknown number in a multiplication or division sentence relating three whole numbers for the last six facts. [3.OA.7] (N3, A3)	4.6.E3. Represent large numbers (to the millions) using place value charts, number lines, and number sentences (e.g., 10,705 = 10,000 + 700 + 5). [4.NBT.2] [MP2, MP3] (N1, A3)	4.8.E6. Write number sentences from area models of fractions (e.g., $\frac{1}{2} = \frac{3}{6}, \frac{1}{3} + \frac{1}{3} = \frac{2}{3}, \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{1}{3}$ x 3). [4.NF.3] [MP1, MP2, MP4, MP7] (N1, A3)

UNIT 9	UNIT 13
4.9.E1. Use addition and subtraction to find unknown angles. [4.MD.7] [MP1, MP2, MP3, MP5] (N2, A3, A4)	4.13.E2. Represent patterns and functions using words, symbols, tables, and graphs. [4.OA.4] [MP1, MP2, MP3, MP5, MP7, MP8] (N1, A2, A3)

Key Idea Algebra 4: Using Patterns **Apply relationships, properties, and patterns to solve problems, develop generalizations, or make predictions.**

Expectations

UNIT 1	UNIT 3	UNIT 5	UNIT 6
4.1.E7. Read a table or graph to find information about a data set. [MP4, MP7] (D3, A4)	4.3.E7. Solve multiplication problems using 0 and 1 as factors (applying the multiplication properties of 0 and 1). [4.OA.3, 4.NBT.5] [MP1, MP2] (N2, A4)	4.5.E7. Make predictions and generalizations using tables and graphs. [4.NBT.3] [MP1, MP6] (D4, A4)	4.6.E5. Use patterns to make predictions and generalizations. [4.OA.5] [MP1, MP2, MP3, MP7] (N1, A4)
4.1.E8. Model real-world situations with bar and point graphs. [5.G.2] [MP1, MP2, MP4, MP5] (D4, A4)	4.3.E8. Use turn-around facts to solve multiplication problems (applying the commutative property of multiplication). [4.NBT.5] [MP1, MP2] (N2, A4)	4.5.E8. Make predictions and generalizations using medians and means. [MP2, MP4, MP5] (D4, A4)	
4.1.E9. Make predictions and generalizations about a data set using a median. [MP2, MP4, MP5] (D4, A4)	4.3.E9. Break products into the sum of simpler products to solve multiplication problems (applying the distributive property of multiplication over addition). [4.NBT.5] [MP1, MP2, MP3] (N2, A4)		
4.1.E10. Make predictions and generalizations about a data set using a data table and graph. [MP2, MP4, MP5] (D4, A4)			

UNIT 7	UNIT 8	UNIT 9	UNIT 10
4.7.E3. Demonstrate understanding of the place value concepts and mathematical properties involved in operations with multidigit numbers (e.g., use the distributive property to multiply). [4.NBT.4, 4.NBT.5] [MP1, MP2, MP6] (N2, A4)	4.8.E11. Multiply fractions by a whole number (e.g., $\frac{1}{3} \times 3 = 1$, $\frac{2}{3} \times 6 = \frac{1}{3} \times 6 \times 2$). [4.NF.4] [MP1, MP2, MP4, MP5] (N2, A4)	4.9. E1. Use addition and subtraction to find unknown angles. [4.MD.7] [MP1, MP2, MP3, MP5] (N2, A3, A4)	4.10.E3. Make predictions and generalizations from line graphs involving decimal values. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D4, A4)

UNIT 11	UNIT 12	UNIT 13
4.11.E1. Demonstrate understanding of the place value concepts and mathematical properties involved in multiplication of 2-digit by 2-digit numbers (e.g., use the distributive property to multiply). [4.NBT.1, 4.NBT.5] [MP1, MP2, MP3, MP6] (N2, A4)	4.12.E3. Show connections between multiplication and division (e.g., fact families, using multiplication to divide). [4.NTB.6] [MP1, MP2] (N2, A4)	4.13.E5. Use the relationship between larger and smaller units of measure to solve problems. [4.MD.1, 4.MD.2] [MP1, MP2, MP6] (M1, A4)
		4.13.E12. Make predictions and generalizations using data tables and graphs. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D4, A4)

Key Idea Geometry 1: Shapes
Identify, describe, classify, and analyze 2- and 3-dimensional shapes based on their properties.

Expectations

UNIT 9	
4.9.E2. Classify acute, obtuse, and right angles. [4.MD.7] [MP1, MP2, MP3, MP5] (G1)	
4.9.E3. Identify points, rays, lines, and line segments. [4.G.2] [MP3, MP4, MP6] (G1)	
4.9.E4. Draw and identify intersecting, perpendicular, and parallel lines. [4.G.1] [MP1, MP6] (G1)	
4.9.E5. Describe and analyze 2-dimensional shapes based on their properties (e.g., number and length of sides, number and size of angles, relationships between sides). [4.G.2, 5.G.3, 5.G.4] [MP1, MP3, MP6] (G1)	
4.9.E6. Classify 2-dimensional shapes using their properties. [4.G.2, 5.G.4] [MP1, MP2, MP3, MP5] (G1)	

Key Idea Geometry 2: Orientation and Location
Use coordinate systems to specify locations and describe spatial relationships.

UNIT 9	
4.9.E9. Identify slides, flips, and turns of shapes. [4.G.3, 8.G.4] [MP1] (G3, G2)	

Key Idea Geometry 3: Motion Apply transformations (slides, flips, and turns) and use symmetry to analyze mathematical situations.

Expectations

UNIT 9	
4.9. E7. Identify line (reflective) symmetry. [4.G.3] [MP1] (G3)	
4.9.E8. Identify congruent shapes. [4.G.2, 8.G.4] [MP1] (G3)	
4.9.E9. Identify slides, flips, and turns of shapes. [4.G.3, 8.G.4] [MP1] (G3, G2)	

Key Idea Geometry 4: Geometric Reasoning Use visualization, spatial reasoning, and geometric modeling to solve problems.

UNIT 2	UNIT 9	
4.2.E4. Recognize and generalize geometric relationships in problems involving the area and perimeter of rectangles. [4.MD.3, 3.MD.5, 3.MD.6, 3.MD.7, 3.MD.8] [MP1, MP2, MP4, MP8] (G4)	4.9.E10. Justify conclusions using geometric properties. [5.G.4] [MP1, MP3, MP6] (G4)	
4.2.E5. Make shapes (polygons) with given measurements (width, perimeter, or area). [3.MD.7, 3.MD.8] [MP3] (G4)		

Key Idea Measurement 1: Measurement Concepts

Understand measurable attributes of objects or situations (length, area, mass, volume, size, time) and the units, systems, and processes of measurement.

Expectations

UNIT 9	UNIT 13		
4.9.E11. Estimate the size of an angle using 90º, 180º, and 360º as benchmarks. [4.MD.5] [MP2, MP5, MP6] (M1)	4.13.E5. Use the relationship between larger and smaller units of measure to solve problems. [4.MD.1, 4.MD.2] [MP1, MP2, MP6] (M1, A4)		

Key Idea Measurement 2: Measurement Skills

Use measurement tools, appropriate techniques, and formulas to determine measurements.

UNIT 2	UNIT 5	UNIT 9	UNIT 10
4.2.E6. Find the perimeter of rectangles and irregular shapes by counting units and adding. [3.MD.7, 3.MD.8] (M2)	4.5.E9. Measure length in centimeters. [4.MD.2] [MP5] (M2)	4.9.E12. Use a protractor to measure and draw angles to the nearest degree. [4.MD.6] [MP5] (M2)	4.10.E4. Measure length to the nearest meter and hundredth of a meter (centimeter). [2.MD.1, 2.MD.2, 4.MD.1] [MP1, MP5, MP6] (M2)
4.2.E7. Find the area of rectangles and irregular shapes by counting, adding, or multiplying. [3.MD.7, 3.MD.8] (M2)			
UNIT 13			
4.13.E6. Measure volume by displacement to the nearest cubic centimeter. [4.MD.1, 4.MD.2] [MP1, MP5, MP6] (M2)			
4.13.E7. Estimate the volume of small objects. [3.MD.2, 4.MD.1, 4.MD.2, 5.MD.3] [MP1, MP2, MP5, MP6] (M2)			
4.13.E8. Measure mass to the nearest gram. [3.MD.2, 4.MD.1, 4.MD.2] [MP4, MP5] (M2)			

Key Idea Data 1: Data Collection

Select, collect, and organize data to answer questions, solve problems, and make predictions.

Expectations

UNIT 1	UNIT 10
4.1.E1. Name variables in an investigation and list appropriate values for each. [3.MD.3, 6.SP.1] [MP1, MP2, MP3] (D1, A1)	4.10.E1. Name variables (manipulated, responding, and fixed) in an investigation. [6.EE.9] [MP1, MP4, MP5, MP6] (D1, A1)
4.1.E2. Distinguish between categorical and numerical variables. [6.SP.1] [MP1] (D1, A1)	

Key Idea Data 2: Data Representation

Select and create appropriate representations, including tables and graphs, for organizing, displaying, and analyzing data.

UNIT 1	UNIT 2	UNIT 5	UNIT 10
4.1.E3. Make a bar graph using categorical data. [MP4] (D2, A2)	4.2.E1. Make a point graph. [5.G.2] [MP4] (D2, A2)	4.5.E1. Represent the variables and procedures of an investigation in a drawing. [6.SP.1] [MP1, MP2, MP3, MP5, MP6] (D2, A1)	4.10.E2. Make a point graph using ordered pairs with decimal values. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.1.E4. Make a bar graph using numerical data. [MP4] (D2, A2)		4.5.E2. Collect and organize data in a table. [MP1, MP2, MP5, MP6] (D2, A2)	
4.1.E5. Make a point graph using ordered pairs. [5.G.2] [MP4] (D2, A2)		4.5.E3. Make a point graph. [5.G.2] [MP4, MP5] (D2, A2)	
		4.5.E4. Draw a best-fit line. [6.SP.2] [MP4, MP5, MP6, MP7, MP8] (D2, A2)	

UNIT 13
4.13.E9. Represent the variables and procedures of an investigation in a drawing. [6.EE.9] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E10. Make point graphs and draw best-fit lines for increasing and decreasing functions. [5.G.1, 5.G.2] [MP1, MP4, MP5, MP6] (D2, A2)
4.13.E11. Tell the story represented in a graph or table. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D2, A2)

Key Idea Data 3: Data Description Describe a data set by interpreting graphs, identifying patterns, and using statistical measures; e.g., average and range.

Expectations

UNIT 1	UNIT 2	UNIT 5	
4.1.E6. Find the median of a data set represented in a table, graph, or line plot. [6.SP.5] [MP4] (D3)	4.2.E2. Read a table or graph to find information about a data set. [MP4, MP7] (D3, A2)	4.5.E5. Find the median of a data set. [4.MD.4, 6.SP.5] [MP2, MP4] (D3)	
4.1.E7. Read a table or graph to find information about a data set. [MP4, MP7] (D3, A4)		4.5.E6. Find the mean of a data set using manipulatives and numerical procedures. [4.OA.3, 6.SP.5] [MP2, MP4] (D3)	

Key Idea Data 4: Using Data Apply relationships and patterns in data to solve problems, develop generalizations, and make predictions.

UNIT 1	UNIT 2	UNIT 5	UNIT 10
4.1.E8. Model real-world situations with bar and point graphs. [5.G.2] [MP1, MP2, MP4, MP5] (D4, A4)	4.2.E3. Model real-world situations with tables and point graphs. [5.G.2] [MP1, MP2, MP4, MP5] (D4, A2)	4.5.E7. Make predictions and generalizations using tables and graphs. [4.NBT.3] [MP1, MP6] (D4, A4)	4.10.E3. Make predictions and generalizations from line graphs involving decimal values. [4.OA.5] [MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8] (D4, A4)
4.1.E9. Make predictions and generalizations about a data set using a median. [MP2, MP4, MP5] (D4, A4)		4.5.E8. Make predictions and generalizations using medians and means. [MP2, MP4, MP5] (D4, A4)	
4.1.E10. Make predictions and generalizations about a data set using a data table and graph. [MP2, MP4, MP5] (D4, A4)			

UNIT 13
4.13.E12. Make predictions and generalizations using data tables and graphs. [4.OA.5] [MP1, MP2, MP3 ,MP4, MP5, MP6, MP7, MP8] (D4, A4)

Notes

Notes

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