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Math in Focus®

Singapore Math® by Marshall Cavendish®

SCOPE & SEQUENCE
Grades K-8 + Accelerated

Global Design.
Elevated Learning.
Proven Achievement.

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Scope and Sequence Grades K–2

Articulated Sequence

Math in Focus® answers the call for a coherent sequence of topics giving students time to master foundational topics, so that little repetition is required the next year.

- **"Missing topics"** When a topic appears to be "missing," you can be assured that it is found in either an earlier or later grade level. For example, you will find calendar concepts in Grade 1, but not repeated in Grade 2.
- **More advanced** As a result of not repeating topics year after year, students who use ***Math in Focus***® will advance faster than students in other programs. As a result, you may find topics that appear to be "too advanced." However, you will find that your students are able to easily handle the challenge as long as they have had the appropriate preliminary instruction.

Preparation for Algebra

Math in Focus® answers the call to prepare students for Algebra. The ***Math in Focus***® sequence of topics emphasizes:

- **Number sense, basic facts, and computation** An early understanding of composition and decomposition of numbers is developed in tandem with mastery of basic facts and computation algorithms in Grades K – 2.
- **Fractions and proportional reasoning** Significant time is allocated for in-depth work with fractions in Grades 3 – 5.
- **Problem solving** Challenging problem solving is built into each chapter in every grade level.

Developmental Continuum

Grade K | **Grades 1 – 2** | **Grades 3 – 5**

Foundational concepts through songs, rhymes, and hands-on activities

- counting
- sorting
- number sense

Concept and skill development through hands-on instruction and practice

- basic facts
- place value
- mental math
- geometry concepts

Emphasis on problem solving, skill consolidation, and a deep understanding in preparation for algebra

- fractions
- decimals
- ratios
- model drawing
- expressions, equations, and inequalities

	Grade K	Grade 1	Grade 2
Number and Operations			
Sets and Numbers	Use concrete models and pictures to create sets with given numbers of objects to 20. [Chapters 1, 2, and 6] Use cardinal and ordinal numbers. [Chapters 1, 2, 6, and 9]	Use concrete and pictorial models to create a set with a given number of objects. (Up to 120) [Chapters 1, 4, 6, and 10] Group objects and numbers up to 120 in tens and ones. [Chapters 1, 4, 6, and 10] Use cardinal numbers up to 120. [Chapters 1, 4, 6, and 10]	Use concrete and pictorial models to create a set with a given number of objects. (Up to 1,000) [Chapter 1] Group objects and numbers up to 1,000 into hundreds, tens, and ones. [Chapter 1] Group objects into equal sized groups. [Chapters 8 and 9]
Number Representation	Use numbers to represent quantities to 20. [Chapters 1, 2, and 6] Write numerals to represent numbers 0 to 20. [Chapters 1, 2, and 6]	Use number bonds to represent number combinations. [Chapter 2]	Use base-ten blocks to create equivalent representations of numbers. [Chapter 1]
Count	Explore count sequence and number names to 100. [Chapters 1, 2, 6, and 9] Count on and back from a given number. [Chapters 1, 2, 6, and 9] Realize that, when counting, the last number named tells how many. [Chapters 1, 2, 6, and 9] While counting objects, say one number name per item. [Chapters 1, 2, 6, and 9] Count numbers of items in sets from different starting points; count sets accurately regardless of arrangements of objects. [Chapters 1, 2, 6, and 9] Relate each successive number name to a quantity that is one greater. [Chapters 1, 2, 6, and 9] Count up to 20 objects in a set. [Chapters 1, 2, and 6] Count on and back to 20. [Chapters 1, 2, and 6] Count by tens to 100. [Chapter 9]	Count within 120. [Chapters 1, 4, 6, and 10] Count by 1s and 10s forward and backward to 100. [Chapters 1, 4, 6, and 10]	Count within 1,000. [Chapter 1] Count by multiples of ones, tens, and hundreds. [Chapters 1 and 9]

	Grade K	Grade 1	Grade 2
Number and Operations (continued)			
Compare and Order	Compare and order sets and numbers up to 20 using counting and matching strategies. [Chapters 4 and 6]	Compare and order whole numbers to 100. [Chapters 1, 4, 6, and 10] Compare and order using the terms same, more, fewer, greater than, less than, equal to, greatest, least. [Chapters 1, 4, 6, and 10]	Compare and order whole numbers to 1,000. [Chapter 1] Use <, >, and = to compare two 2-digit numbers. [Chapter 1]
Compose and Decompose Numbers	Compose and decompose numbers less than or equal to 10 into pairs in more than one way. [Chapter 2] Compose and decompose numbers less than or equal to 20 into pairs in more than one way. [Chapter 6]		
Place Value	Compose and decompose numbers from 11 to 19 into ten ones and some further ones and 20 as 2 tens. [Chapter 6] Explore numbers 21 to 100 as tens and ones. [Chapter 9]	Use base-ten blocks and place-value charts to represent numbers to 120. [Chapters 1, 4, 6, and 10] Write numbers to 120 in standard and word forms. [Chapters 1, 4, 6, and 10]	Use base-ten blocks and place-value charts to represent numbers to 1,000. [Chapter 1] Write numbers to 1,000 in standard and word forms. [Chapter 1] Compose and decompose multi-digit numbers (including expanded form). [Chapter 1]
Fraction Concepts		Partition shapes into two to four equal shares. [Chapter 3] Describe the shares using the terms halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. [Chapter 3] Understand that dividing a shape into more equal shares makes smaller shares. [Chapter 3]	Partition circles and rectangles into unit fractions halves, thirds, and fourths. [Chapter 11]
Money		Identify and relate coin values (penny, nickel, dime, quarter). [Chapter 13] Count and make simple coin combinations. [Chapter 13]	Identify $1, $5, $10, $20 bills. [Chapter 10] Count and make combinations of coins and bills. [Chapter 10] Compare money amounts. [Chapter 10] Solve word problems involving money, using $ and ¢ appropriately. [Chapter 10]
Decimal Concepts			Use the dollar sign and decimal point. [Chapter 10]

	Grade K	Grade 1	Grade 2
Number and Operations (continued)			
Whole Number Computation: Addition and Subtraction	Model joining and separating sets. [Chapters 7 and 8] Use +, –, and = to write number sentences for addition and subtraction stories. [Chapters 7 and 8]	Model addition and subtraction situations. [Chapters 2, 5, and 8] Add and subtract within 20, using appropriate models, numbers, and symbols. [Chapter 5] Understand the meaning of the equal sign; decide if equations involving addition and subtraction are true or false. [Chapters 2 and 5] Use the order, grouping, and zero properties to develop addition and subtraction fact strategies. [Chapters 2, 5, 8, and 11] Add and subtract up to two 2-digit numbers with and without regrouping. [Chapters 8 and 11]	Model addition and subtraction within 1,000 using place-value strategies. [Chapters 2 and 3] Recall addition and subtraction facts. [Chapters 2 and 3] Use different methods to develop fluency in adding and subtracting multi-digit numbers. [Chapters 2 and 3] Add and subtract whole numbers to 1,000. [Chapters 2 and 3]
Whole Number Computation: Addition and Subtraction Real-World Problems	Represent and solve addition and subtraction stories with manipulatives, actions, drawings, and number sentences. [Chapters 7 and 8]	Create addition and subtraction stories. [Chapters 2, 5, and 8] Solve addition and subtraction problems using basic facts. [Chapters 2, 5, and 8]	Solve multi-digit addition and subtraction problems by using a bar model. [Chapter 4]
Develop Fluency with Addition and Subtraction to 5	Practice addition and subtraction in different contexts with words, models, fingers, and numerals. [Chapters 7 and 8]		
Whole Number Computation: Multiplication and Division Concepts		Add the same number to find the total number of items in equal groups. [Chapter 8]	Multiply and divide with 2, 3, 4, 5, and 10. [Chapter 9] Represent multiplication as repeated addition. [Chapter 8] Model division as repeated subtraction. [Chapter 8] Use the ×, ÷, and = symbols to represent multiplication and division strategies. [Chapters 8 and 9]

	Grade K	Grade 1	Grade 2
Number and Operations (continued)			
Whole Number Computation: Multiplication and Division Real-World Problems			Solve multiplication and division fact problems. [Chapters 8 and 9]
Decimal Computation			Solve addition and subtraction word problems involving money. [Chapter 10]
Estimation and Mental Math		Use mental math strategies to add and subtract. [Chapters 8 and 11]	Use mental math strategies to add and subtract. [Chapters 2 and 3]
Algebra/Expressions and Equations			
Patterns	Describe and extend repeating shape patterns. [Chapter 5] Find missing terms in repeating patterns. [Chapter 9] Count by 10s. [Chapter 9] Describe a rule for sorting objects. [Chapter 10]	Identify, describe, and extend two- and three-dimensional shape patterns. [Chapter 3] Identify a rule for sorting objects. [Chapter 3] Identify and extend growing and repeating patterns. [Chapters 1, 4, 6, and 10] Find missing terms in growing and repeating patterns. [Chapters 1, 4, 6, and 10]	Describe, extend, and create two-dimensional shape patterns. [Chapter 11] Skip count by 2s, 3s, 4s, 5s, and 10s. [Chapters 1 and 9] Identify rules for number patterns. [Chapter 1]
Properties		Use the Associative and Commutative Properties of Addition. [Chapters 2 and 5]	Understand that addition and subtraction are inverse operations. [Chapters 2 and 3] Apply properties of addition. [Chapter 2] Use the Distributive Property as a multiplication strategy. [Chapter 8]
Number Theory			Determine whether a group of objects has an odd or even number of members. [Chapter 8] Identify odd and even numbers. [Chapter 8]
Functional Relationships		Understand the relationships between the numbers in fact families. [Chapters 2 and 5]	Recognize how bar models show relationships between numbers and unknowns in number sentences. [Chapter 4]

	Grade K	Grade 1	Grade 2
Algebra/Expressions and Equations (continued)			
Expressions/ Models	Use objects, fingers, drawings, and symbols to represent numbers. [Chapters 1, 2, 6, and 9] Use a variety of concrete (objects, fingers), pictorial, and symbolic models for addition and subtraction. [Chapters 7 and 8] Use objects to represent geometric figures. [Chapter 5]	Use a variety of concrete, pictorial, and symbolic models for addition and subtraction. [Chapters 2, 5, 8, and 11]	Use a variety of concrete, pictorial, and symbolic models for addition, subtraction, multiplication, and division. [Chapters 2, 3, 4, 8, and 9]
Number Sentences and Equations	Model addition and subtraction stories with addition and subtraction number sentences. [Chapters 7 and 8]	Model addition and subtraction situations by writing addition and subtraction number sentences. [Chapters 2, 5, and 8]	Model multiplication and division situations by writing multiplication and division number sentences. [Chapters 8 and 9] Use number sentences to represent real-world problems. [Chapter 8] Determine the value of missing quantities in number sentences. [Chapters 2, 3, 8, and 9]
Equality and Inequality	Understand the meaning of the = sign in number sentences. [Chapters 7 and 8]		Use and create models that demonstrate equality or inequality. [Chapter 1] Use <, >, and = to write number sentences. [Chapter 1]
Geometry			
Size and Position	Use vocabulary such as beside and above to describe and compare relative positions of objects. [Chapter 5] Use positional words to describe location. [Chapter 5]		
Lines and Angles			Identify lines and curves. [Chapter 11]

	Grade K	Grade 1	Grade 2
Geometry (continued)			
Two-Dimensional Shapes/ Polygons	Describe, compare, and name two-dimensional shapes regardless of their orientations and overall sizes. [Chapter 5] Name flat shapes that make up surfaces of real-world objects. [Chapter 5] Sort and classify two-dimensional shapes. [Chapter 5] Combine simple shapes to form larger shapes and pictures. [Chapter 5] Make and extend two-dimensional shape patterns. [Chapter 5]	Identify real-world two-dimensional shapes. [Chapter 3] Identify and describe attributes and properties of two-dimensional shapes. [Chapter 3] Sort and classify two-dimensional shapes based on attributes. [Chapter 3] Compose and decompose two-dimensional shapes. [Chapter 3]	Recognize and draw shapes based on specified attributes. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. [Chapter 11] Identify lines and curves. [Chapter 11] Compose and decompose two-dimensional shapes. [Chapter 11]
Three-Dimensional Shapes/Solid Figures	Analyze, describe, compare, name, and sort solid shapes. [Chapter 5] Understand that the surfaces of three-dimensional shapes are made up of two-dimensional shapes. [Chapter 5]	Identify real-world three-dimensional shapes. [Chapter 3] Identify two-dimensional shapes in three-dimensional shapes. [Chapter 3] Sort and classify three-dimensional shapes. [Chapter 3] Recognize shapes from different perspectives. [Chapter 3] Compose and decompose three-dimensional shapes. [Chapter 3]	Identify, describe, sort, and classify three-dimensional shapes. [Chapter 11] Identify surfaces that slide, stack, and roll. [Chapter 11]

	Grade K	Grade 1	Grade 2
Measurement			
Length and Distance	Compare lengths (long, short, longer, shorter). [Chapter 3] Describe and compare lengths and heights using non-standard units. [Chapter 3] Develop a background for measurement by comparing and using non-standard units. [Chapter 3]	Compare the lengths of two objects by comparing each with a third length (transitivity). [Chapter 9] Use a start line to measure length. [Chapter 9] Measure lengths, using non-standard units. [Chapter 9] Explain the need for equal-length units to measure. [Chapter 9] Count length units in groups of tens and ones. [Chapter 9] Compare measurements made using different units. [Chapter 9] Understand the inverse relationship between the size of a unit and the number of units. [Chapter 9]	Demonstrate linear measure as an iteration of units. [Chapter 5] Use rulers to measure length. [Chapter 5] Measure length in meters, centimeters, feet, and inches. [Chapter 5] Use units of different length to measure an object twice; describe how the two measurements relate to the size of the unit chosen. [Chapter 5] Compare and measure lengths using customary and metric units. [Chapter 5] Demonstrate partitioning and transitivity in relation to length. [Chapter 5] Solve problems involving estimating, measuring, and computing length. [Chapter 5] Solve addition and subtraction word problem involving length. [Chapter 5]
Weight/Mass	Compare objects by weight. [Chapter 3]	Compare and measure weights using non-standard units. [Chapter 9] Compare the weight of two objects by comparing each with a third weight (transitivity). [Chapter 9] Solve weight problems. [Chapter 9]	Compare and measure masses. [Chapter 6] Solve addition and subtraction word problems involving mass. [Chapter 6]
Time		Read a calendar to identify the days of the week, months, and seasons of the year. [Chapter 7] Recognize the correct way to write the date. [Chapter 7] Tell time in hours and half hours on analog and digital clocks. [Chapter 7]	Tell and write time using AM and PM. [Chapter 10] Tell time to the nearest five minutes. [Chapter 10] Find elapsed time. [Chapter 10]
Area		Compose and decompose two-dimensional shapes (foundation for understanding area). [Chapter 3]	Develop foundations for understanding area. [Chapter 11]

	Grade K	Grade 1	Grade 2
Data Analysis/Statistics and Probability			
Classifying and Sorting	Understand similarities and differences in objects and shapes. [Chapters 5 and 10] Identify attributes that may be used as a basis for sorting. [Chapter 10] Sort and classify objects using one or two attributes. [Chapter 10] Count and compare numbers of objects in categories. [Chapter 10]	Sort and classify geometric shapes. [Chapter 3] Sort and classify data in order to make picture graphs and tally charts. [Chapter 12]	Sort and classify two- and three-dimensional shapes by properties. [Chapter 11] Collect and organize data in picture graphs. [Chapter 7]
Collect and Organize Data		Collect and organize data in different ways. [Chapter 12]	Collect and organize data in different ways. [Chapter 7]
Represent Data		Represent measurements and data in picture graphs and tally charts. [Chapter 12]	Represent measurement data in a line plot using whole numbers. [Chapter 7]
Interpret/ Analyze Data		Interpret data in picture graphs and tally charts. [Chapter 12] Solve problems involving data. [Chapter 12]	Interpret picture graphs with scales. [Chapter 7] Solve word problems using picture graphs. [Chapter 7]
Making Sense in Solving Problems			
Build Skills Through Problem Solving	Build skills in comparing sets, and addition and subtraction encountering, discussing, and solving problems.	Build skills in addition, subtraction, and measurement through problem solving.	Build skills in addition, subtraction, multiplication, division, and measurement through problem solving.
Solve Real-World Problems	Solve real-world problems involving sorting, counting, and addition and subtraction.	Solve real-world problems involving addition and subtraction.	Solve real-world problems involving addition, subtraction, multiplication, division, and measurement.
Reasoning			
Use Appropriate Strategies and Thinking Skills to Solve Problems	Decide on number sentences to fit addition and subtraction situations.	Apply problem-solving strategies in Put On Your Thinking Cap! and other problem-solving activities.	Apply problem-solving strategies in Put On Your Thinking Cap! and other problem-solving activities.

	Grade K	Grade 1	Grade 2
Reasoning (continued)			
Apply and Explain Problem Solving	Solve real-world problems and describe methods for doing so. Explain why solutions make sense and are correct. Encounter situations in which there is more than one good answer.	Apply and explain problem-solving processes in Put On Your Thinking Cap! and other activities.	Apply and explain problem-solving processes in Put On Your Thinking Cap! and other activities.
Explore Concepts	Use models to explain reasoning. Explore concepts more deeply and justify reasoning in Put On Your Thinking Cap! and other problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Hands-on Activities, Put On Your Thinking Cap!, and other problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Hands-on Activities, Put On Your Thinking Cap!, and other problem-solving activities.
Investigate Mathematical Ideas	Apply counting and comparing skills in a wide variety of contexts; use numerals to convey information. Investigate ideas with two-dimensional and three-dimensional shapes. Investigate measurement concepts.	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.
Identify, Demonstrate, and Express Regularity in Reasoning	Explain ways of identifying equal sets or explain which set has more or fewer. Demonstrate that only a few big objects fit into small spaces and many small objects fit into big spaces. Describe, sort, and classify two- and three-dimensional shapes. Identify and extend repeating shape patterns. Explain why solutions make sense and are correct. Resist counter-suggestions about answers.	Explore transitivity by comparing lengths and weights of three different objects. Identify and describe attributes and properties of two- and three-dimensional shapes. Interpret picture graphs, tally charts, and bar graphs. Identify and extend growing number patterns and repeating shape patterns.	Demonstrate the inverse relationship between the size of a unit and the number of units. Identify, describe, sort, and classify two- and three-dimensional shapes. Interpret picture graphs with scales. Identify rules for number patterns.

	Grade K	Grade 1	Grade 2
Reasoning (continued)			
Use a Variety of Reasoning Skills	Sort and classify using attributes. Identify similarities and differences. Determine numbers given clues; explain and justify answers. Analyze two- and three-dimensional shapes; identify their attributes and name them based on their attributes.	Recognize shapes from different perspectives. Use the Commutative and Associative properties, and tens and ones to solve 2-digit addition and subtraction problems.	Identify surfaces that slide, stack, and roll. Explore the inverse relationship between addition and subtraction.
Communication			
Consolidate Mathematical Thinking	Consolidate thinking in independent activities.	Present mathematical thinking through Math Journal activities.	Present mathematical thinking through Math Journal activities.
Communicate with Peers, Teachers, and Others	Discuss mathematical ideas in paired and small group activities as well as activities led by the teacher.	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.
Share Mathematical Thinking	Share mathematical ideas in paired and small group activities.	Share mathematical ideas with others during Let's Explore and Hands-on Activities.	Share mathematical ideas with others during Let's Explore and Hands-on Activities.
Construct Arguments and Express Mathematics Ideas	Express ideas – with words and gestures – in paired and small group activities as well as activities led by the teacher. Use models and pictures as stimulus for explaining thinking.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.
Connections and Structure			
Look for and Use Structure to Recognize Connections in Mathematical Ideas	Understand the connection between quantities and written numerals. Use numbers to describe properties of geometric shapes. Use counting and numbers while measuring in non-standard units.	Relate counting to addition and subtraction. Understand the relationships between the numbers in fact families. Connect addition and multiplication (repeated addition). Recognize and apply different strategies for adding and subtracting 1- and 2-digit numbers.	Examine and apply the inverse relationship between addition and subtraction. Connect geometric concepts with unit fractions. Connect subtraction and division (repeated subtraction). Recognize and apply different strategies for multiplication and division facts.

	Grade K	Grade 1	Grade 2
Connections and Structure (continued)			
Understand How Concepts Build on One Another	Explore relationships among counting, ordering, and ordinal numbers. Compare and relate attributes of two- and three-dimensional figures. Use a variety of measurement attributes to compare objects.	Learn how place-value concepts apply to regrouping in addition and subtraction.	Understand how patterns can be described using numbers, operations, and data displays. Recognize the relationship between bar models, number sentences, and number patterns.
Solve Real-World Problems in Contexts Outside of Mathematics	Solve real-world problems involving more and less, and addition, and subtraction. Identify two- and three-dimensional figures in real-world objects.	Solve real-world problems involving addition, subtraction, graphs, and money.	Solve real-world problems involving addition, subtraction, multiplication, division, measurement, and data analysis.
Representation and Model Mathematics			
Use Representations to Attend to Precision	Use concrete models to create a set with a given number of objects to 20. Use numbers and numerals to represent quantities up to 20. Use picture cards to communicate understanding of comparisons (bigger, taller, smaller). Understand the meaning of the +, –, and = symbols in number sentences. Model addition and subtraction stories with addition and subtraction number sentences. Represent addition and subtraction stories.	Use concrete and pictorial models to create a set with a given number of objects. (Up to 120) Represent numbers to 100 on a number line. Use number bonds to represent numbers. Understand equality and inequality. Use the +, –, and = symbols to represent real-world addition and subtraction situations. Represent numerical data using picture graphs, tally charts, and bar graphs. Represent sharing equally and making equal groups. Identify, describe and extend two- and three-dimensional shape patterns. Identify a rule for sorting objects. Identify and extend growing and repeating patterns.	Use concrete and pictorial models to create a set with a given number of objects. (Up to 1,000) Represent numbers to 1,000 on a number line. Use symbolic notation (<, >) to compare numbers. Use bar models to represent addition and subtraction situations. Represent numerical data using picture graphs with scales, tally charts, and bar graphs. Use the ×, ÷, and = symbols to represent multiplication and division situations. Represent multiplication with skip counting, dot paper arrays, and bar models. Represent division as repeated subtraction sentences. Describe, extend and create two-dimensional shape patterns. Identify rules for number patterns.

	Grade K	Grade 1	Grade 2
Representation and Model Mathematics (continued)			
Select and Apply Appropriate Models and Tools to Represent Problems	Represent quantities with objects, number cubes, fingers, pictures/drawings, number cards, acting out, tallies, and numerals.	Use number bonds to represent number combinations. Use a variety of concrete, pictorial, and symbolic models and tools for addition and subtraction. Use technology (virtual manipulatives and computers) to model and draw.	Use place value models to create equivalent representations of numbers. Use a variety of concrete, pictorial, and symbolic models and tools for addition, subtraction, multiplication, and division. Represent multiplication with skip counting and arrays. Use customary and metric measuring tools to measure length. Use metric measuring tools to measure mass. Use technology (virtual manipulatives and computers) to model and draw.
Interpret Phenomena Through Representations	Describe and compare objects by position. Identify flat shapes that make up surfaces of real-world objects. Use one-to-one correspondence to identify equality, or more or less.	Measure and compare lengths and weights using non-standard units. Identify real-world two- and three-dimensional shapes. Represent data in picture graphs. Solve problems about sharing equally and making equal groups. Use a variety of models for adding and subtracting.	Use metric and customary units to measure length and mass. Represent data in bar graphs and picture graphs. Solve real-world problems about social phenomena. Use bar models to represent addition, subtraction, multiplication, and division situations.

Scope and Sequence Grades 3–5

Articulated Sequence

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- **Problem solving** Challenging problem solving is built into each chapter in every grade level.

Developmental Continuum

Grade K | **Grades 1–2** | **Grades 3–5**

Foundational concepts through songs, rhymes, and hands-on activities

- counting
- sorting
- number sense

Concept and skill development through hands-on instruction and practice

- basic facts
- place value
- mental math
- geometry concepts

Emphasis on problem solving, skill consolidation, and a deep understanding in preparation for algebra

- fractions
- decimals
- ratios
- model drawing
- expressions, equations, and inequalities

	Grade 3	Grade 4	Grade 5
Number and Operations			
Number Representation	Represent numbers to 10,000 in different equivalent forms. [Chapter 1]	Represent numbers to 1,000,000 in various contexts. [Chapter 1]	Express numbers to 10,000,000 in various forms. [Chapter 1] Use line exponents to denote powers of 10. [Chapter 1]
Count	Count within 10,000. [Chapter 1] Count by hundreds and thousands. [Chapter 1]	Count by hundred thousands, thousands and ten thousands. [Chapter 1]	Count by hundred thousands and millions. [Chapter 1]
Compare and Order	Compare and order whole numbers to 10,000. [Chapter 1]	Compare and order whole numbers to 1,000,000. [Chapter 1]	Compare and order whole numbers to 10,000,000. [Chapter 1]
Place Value	Use place-value models to read, write, and represent numbers to 10,000. [Chapter 1]	Write numbers to 1,000,000 in standard, expanded, and word forms. [Chapter 1]	Understand place-value concepts through millions. [Chapter 1]
Fraction Concepts	Understand the meanings and uses of fractions including fraction as part of a set. [Chapter 7] Understand that the size of a fractional part is relative to the size of the whole. [Chapter 7] Compare fractions using models, and number lines. [Chapter 7] Recognize equivalent fractions through the use of models and number lines. [Chapter 7] Write whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. [Chapter 7]	Recognize, write, name, and illustrate mixed numbers and improper fractions in various forms. [Chapter 3] Find a fraction of a set. [Chapter 3] Generate equivalent fractions. [Chapter 3] Compare nonequivalent fractions by creating common denominators or numerators, or by comparing with benchmark fractions. Use <, >, and = symbols. [Chapter 3] Convert among mixed numbers and improper fractions. [Chapter 3]	Understand how to convert fractions to decimals. [Chapter 4] Understand the relationships between fractions and division expressions. [Chapter 2]
Money	Add and subtract money. [Chapters 2 and 3] Solve real-world problems involving addition and subtraction of money. [Chapters 2 and 3]		

	Grade 3	Grade 4	Grade 5
Number and Operations (continued)			
Decimal Concepts		Model decimals using tenths and hundredths. [Chapter 4] Understand decimal notation through hundredths as an extension of the base-ten system. [Chapter 4] Read and write decimals that are greater than or less than 1. [Chapter 4] Compare and order decimals. Identify equivalent decimals. [Chapter 4] Identify equivalent fractions and decimals. [Chapter 4] Use the dollar sign and decimal point in money amounts. [Chapter 4]	Model decimals using thousandths. [Chapter 4] Understand place value concepts through thousandths. [Chapter 4] Understand how to convert decimals to fractions. [Chapter 4]
Whole Number Computation: Addition and Subtraction	Model regrouping in addition and subtraction using place-value strategies. [Chapters 2 and 3] Add and subtract whole numbers to 10,000. [Chapters 2 and 3]	Model regrouping in addition and subtraction using place-value strategies. [Chapter 1] Fluently add and subtract multi-digit whole numbers using the standard algorithm. [Chapter 1]	
Whole Number Computation: Addition and Subtraction Real-World Problems	Solve addition and subtraction problems with greater numbers by using a bar model. [Chapters 2 and 3]		
Whole Number Computation: Multiplication and Division Concepts	Multiply and divide with 6, 7, 8, 9, 10, 11, and 12. [Chapter 4] Represent multiplication in different ways. [Chapter 4] Model division in different ways. [Chapter 4]	Apply understanding of models for multiplication and division. [Chapter 2] Recall multiplication facts and related division facts. [Chapter 2] Illustrate and explain multiplication and division by using equations, rectangular arrays, and/or area models. [Chapter 2]	

	Grade 3	Grade 4	Grade 5
Number and Operations (continued)			
Whole Number Computation: Multiplication and Division Algorithms	Multiply ones, tens, and hundreds with and without regrouping. [Chapter 5] Apply properties of addition and multiplication to multiply. [Chapter 5]	Develop fluency in multiplying multi-digit numbers. [Chapter 2] Multiply a 4-digit whole number by a 1-digit whole number, and multiply two 2-digit numbers using strategies based on place value and the properties of operations. [Chapter 2] Divide by a 1-digit number, with a remainder. [Chapter 2]	Multiply multi-digit numbers. [Chapter 1] Find quotients involving multi-digit dividends. [Chapter 1]
Whole Number Computation: Multiplication and Division Real-World Problems	Use bar models to represent multiplication and division situations. [Chapter 6] Solve one- and two-step multiplication and division problems. [Chapter 6]	Multiply or divide to solve word problems involving multiplicative comparison by using drawings and equations with a symbol for the unknown number to represent the problem. [Chapter 2] Solve multi-digit multiplication and division problems. [Chapter 2] Solve division problems that involve interpreting the remainder. [Chapter 2]	Compare the size of a product to one factor without multiplication. [Chapter 1] Solve multiplication and division problems. [Chapter 1] Determine the most useful form of the quotient and interpret the remainder. [Chapter 1]
Fraction Computation		Add and subtract like fractions. [Chapter 3] Solve word problems involving multiplication of a fraction by a whole number. [Chapter 3]	Add and subtract unlike fractions and mixed numbers. [Chapter 2] Multiply proper fractions, improper fractions, mixed numbers, and whole numbers. [Chapter 3] Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. [Chapter 3] Divide fractions by whole numbers. [Chapter 3] Divide a whole number by a unit fraction. [Chapter 3] Solve word problems with addition, subtraction, multiplication, and division of fractions. [Chapter 3]

	Grade 3	Grade 4	Grade 5
Number and Operations (continued)			
Decimal Computation	Add and subtract money amounts. [Chapters 2 and 3]		Add and subtract decimals. [Chapter 5] Multiply and divide decimals by whole numbers. [Chapter 5] Solve problems with multiplication and division of decimals. [Chapter 5]
Estimation and Mental Math	Use mental math strategies to add, subtract, multiply, and divide. [Chapters 2, 3, 4, and 5] Use mental computation and estimation to assess the reasonableness of answers. [Chapters 2, 3, 4, 5, and 6] Use rounding to estimate sums and differences. [Chapters 2 and 3]	Use mental math and estimation strategies to find sums, differences, products, and quotients. [Chapters 1 and 2] Decide whether an estimate or exact answer is needed. [Chapters 1 and 2] Round and estimate with decimals. [Chapter 4]	Use estimation and mental math to estimate sums, differences, products, and quotients. [Chapter 5] Round decimals. [Chapter 4] Estimate sums and differences with fractions and decimals. [Chapters 2 and 5] Estimate products and quotients with decimals. [Chapter 5]
Algebra / Expressions and Equations			
Patterns	Create and describe addition and multiplication and division patterns. [Chapters 2 and 4] Skip count by 6s, 7s, 8s, and 9s. [Chapter 4] Analyze number and counting patterns. [Chapters 1, 2, and 4]	Identify, describe, and extend numeric and nonnumeric patterns. [Chapter 1] Use a rule to describe a sequence of numbers or objects. [Chapter 1]	Identify, describe, and extend numeric patterns involving all operations. [Chapter 7] Find rules to complete number patterns. [Chapter 7] Form and graph ordered pairs of corresponding terms from two numerical patterns. [Chapter 7]
Properties	Use the Associative Property, Identity Property, and Commutative Property as addition strategies. [Chapter 2] Understand that multiplication and division are related. [Chapter 4] Create and explain multiplication and division patterns. [Chapter 4] Model, define, and explain properties of multiplication. [Chapter 4]	Represent division as the inverse of multiplication. [Chapter 2]	Explain patterns in the number of zeroes and in the placement of the decimal point when multiplying a number by a power of 10. [Chapter 5]

	Grade 3	Grade 4	Grade 5
Algebra / Expressions and Equations (continued)			
Number Theory		Find the greatest common factor and least common multiple. [Chapter 2] Determine if a whole number is prime or composite. [Chapter 2]	Apply the least common multiple concept to finding a common denominator for two fractions. [Chapter 2]
Functional Relationships	Understand the relationships between the numbers in multiplication-division fact families. [Chapter 4]	Understand the relationships between the numbers and symbols in formulas for area and perimeter. [Chapter 6]	Understand the relationships between the numbers and symbols in formulas for volume. [Chapter 6] Describe number relationships in context. Graph ordered pairs and equations from tables of values. [Chapter 7]
Expressions/ Models	Use a variety of concrete, pictorial, and symbolic models for multi-digit addition, subtraction, multiplication, and division. [Chapters 2, 3, and 6] Represent two-step word problems with unknown quantities. [Chapters 2, 3, and 6]	Use a variety of concrete, pictorial, and symbolic models for multiplication and division, and addition and subtraction with fractions. [Chapters 2 and 3]	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. [Chapter 1] Write and simplify numerical expressions. [Chapter 1] Evaluate numeric expressions with two or more operations using the order of operations. [Chapter 1]
Number Sentences and Equations	Write multiplication and division number sentences. [Chapters 4, 5, and 6] Write and solve number sentences for one- and two step real-world problems. [Chapters 2, 3, and 6] Determine the missing parts (quantities or symbols) in number sentences. [Chapters 2, 3, and 6]	Write and solve number sentences for multi-step word problems. [Chapters 1, 2, and 3] Use bar models and number sentences for multi-step real-world problems. [Chapters 1, 2, and 3] Determine the missing parts (quantities or symbols) in number sentences. [Chapters 1, 2, and 3]	Write and solve number sentences and equations for multi-step word problems. Write and solve equations. [Chapters 1, 2, 3, 5, 6, 9, and 10] Graph linear equations. [Chapter 7]
Equality and Inequality	Understand equality and inequality. [Chapter 1]	Understand equality and inequality. [Chapter 1]	Understand equality and inequality. [Chapter 1] Write and interpret statements of equality and inequality. [Chapter 1]

	Grade 3	Grade 4	Grade 5
Algebra / Expressions and Equations (continued)			
The Coordinate Plane			Identify and plot points in the first quadrant of the coordinate plane. [Chapter 7] Make a table of values from an equation, and plot the points these ordered pairs form in the coordinate plane. [Chapter 7]
Geometry			
Lines and Angles	Identify perpendicular and parallel lines. [Chapter 12] Identify right angles and compare angles to right angles. [Chapter 12]	Draw perpendicular and parallel lines. [Chapter 7] Draw and measure angles. [Chapter 7] Understand the relationship between angles and circular measurement (360 degrees). [Chapter 7] Recognize that angle can be broken down into smaller parts. [Chapter 7] Understand how to work with angles on a straight line. [Chapter 7] Understand how to work with angles at a point. [Chapter 7] Apply the sum of the angles on a straight line to solve problems. [Chapter 7]	
Two-Dimensional Shapes / Polygons	Describe, analyze, compare, and classify two-dimensional shapes by their sides and angles. [Chapter 12] Classify and sort polygons and quadrilaterals by specified attributes and properties. [Chapter 12] Measure and compare the area of plane figures in square units. [Chapter 9]	Apply the properties of squares and rectangles. [Chapter 6] Find unknown angle measures and side lengths of squares and rectangles. [Chapters 6 and 7] Understand the relationships between the numbers and symbols in formulas for area and perimeter. [Chapter 6]	Apply the properties of right, isosceles, and equilateral triangles. [Chapter 8] Apply the properties of a parallelogram, rhombus, and trapezoid. [Chapter 8]
Three-Dimensional Shapes / Solid Figures			Create a solid figure by using unit cubes. [Chapter 6]

	Grade 3	Grade 4	Grade 5
Geometry (continued)			
Congruence and Symmetry		Recognize line symmetry. [Chapter 8]	
Coordinate Geometry		Develop coordinate readiness with tables and line graphs. [Chapter 9]	Plot points on a coordinate grid (first quadrant only). [Chapter 7]
Measurement			
Length and Distance	Solve one-step real-world problems in measurement. [Chapter 8]	Write a larger unit of length in terms of a smaller unit. [Chapter 5] Solve real-world problems in measurement involving length. [Chapter 5]	Use measurement conversions of length in solving real-world problems. [Chapters 1, 2, 3, 5, 6, 9, and 10]
Weight/Mass	Select appropriate units and tools to estimate and measure weight. [Chapter 8] Estimate and measure masses of objects. [Chapter 8] Convert among units of mass. [Chapter 8]	Write a larger unit of length in terms of a smaller unit. [Chapter 5] Solve real-world problems in measurement and estimation involving weight/mass. [Chapter 5]	Use measurement conversions of weight/mass in solving real-world problems. [Chapters 1, 2, 3, 5, 6, 9, and 10]
Capacity/ Volume	Select appropriate tools and units to estimate and measure volume and capacity. [Chapter 8] Estimate and measure capacity in liters and milliliters. [Chapter 8] Convert among metric units of capacity. [Chapter 8]	Determine the relative sizes of measurement units within a system. [Chapter 5] Solve real-world problems in measurement involving volume. [Chapter 5] Write a larger unit of volume in terms of a smaller unit. [Chapter 5]	Use measurement conversions of capacity/volume in solving real-world problems. Estimate and measure volume in cubic units. [Chapter 6] Recognize volume as additive and find the volumes of prisms and solid figures. [Chapter 6] Use formulas to find the volume of rectangular prisms and other solid figures. [Chapter 6]
Time	Tell time to the nearest minute. [Chapter 10] Convert between hours and minutes. [Chapter 10] Determine elapsed time. [Chapter 10] Add and subtract units of time. [Chapter 10]	Write a larger unit of time in terms of a smaller unit. [Chapter 5]	

	Grade 3	Grade 4	Grade 5
Measurement (continued)			
Angles	Compare angles to right angles. [Chapter 12]	Estimate and measure angles in whole-number degrees with a protractor. [Chapter 7] Classify angles by angle measure and recognize angle measure as additive. [Chapter 7] Relate $\frac{1}{4}$-, $\frac{1}{2}$-, $\frac{3}{4}$-, and full turns to the number of right angles. [Chapter 7] Understand the relationship between angles and the 360 degrees of the measure of a circle. [Chapter 7] Apply the idea that the sum of angles on a straight line is 180 degrees. [Chapter 7] Apply the idea that vertical angles are equal in measure. [Chapter 7] Apply the idea that the sum of angles at a point is 360 degrees. [Chapter 7]	
Perimeter / Perimeter and Circumference	Measure perimeter of plane figures. [Chapter 9] Choose the appropriate tool, unit, and strategy to measure perimeter. [Chapter 9] Estimate the perimeter of surfaces and objects. [Chapter 9]	Find the perimeter of composite figures. [Chapter 6] Solve problems involving the perimeter of squares, rectangles, and composite figures. [Chapter 6]	
Area	Find and compare the area of plane figures in different square units. [Chapter 9] Draw different plane figures with the same area. [Chapter 9] Estimate area of small and large surfaces. [Chapter 9] Compare the area and perimeter of two plane figures. [Chapter 9] Find the area of rectangles and composite figures. [Chapter 9]	Connect area measure to the area model for multiplication; use it to justify the formula for the area of a rectangle. [Chapter 6] Estimate and measure area in square units. [Chapter 6] Select appropriate units, strategies, and tools to solve area. [Chapter 6] Recognize area as additive. [Chapter 6]	

	Grade 3	Grade 4	Grade 5
Measurement (continued)			
Surface Area and Volume			Estimate and measure volume in cubic units. [Chapter 6]
Ratios and Proportional Relationships			
Ratios			Understand concept of ratio. [Chapter 9] Use ratios to solve problems. [Chapter 9] Find equivalent ratios. [Chapter 9] Solve two-step real-world problems involving ratios. [Chapter 9]
Percents			Relate percent to parts of a whole where the whole is made up of 100 equal parts. [Chapter 10] Relate and compare percents, decimals, and fractions. [Chapter 10] Express fractions as percent and vice versa. [Chapter 10] Express decimals as percent and vice versa. [Chapter 10] Find the percentage of a quantity, given the amount and the percentage. [Chapter 10] Solve real-world problems involving percent. [Chapter 10]
Data Analysis / Statistics and Probability			
Classifying and Sorting	Classify and sort polygons and quadrilaterals by specified attributes and properties. [Chapter 12] Collect and organize data in bar graphs and line plots. [Chapter 11]	Construct line plots, tables, and line graphs. [Chapter 9]	Generate a double graph to represent and compare data. [Chapter 7]
Represent Data	Represent measurement data in a line plot where the horizontal scale is marked in whole numbers, halves, or quarters. [Chapter 11]	Make a line plot to display a data set of measurements in fractions of a unit. [Chapter 3]	Make a line plot to display a data set of measurements in fractions of a unit. [Chapter 7]

	Grade 3	Grade 4	Grade 5
Data Analysis / Statistics and Probability (continued)			
Interpret/ Analyze Data	Interpret picture graphs with scales. [Chapter 11] Use bar graphs, picture graphs, and line plots to solve real-world problems. [Chapter 11]	Interpret tally charts, bar graphs, picture graphs, tables, line graphs, and line plots. [Chapter 9]	Interpret tally charts, bar graphs, picture graphs, tables, line graphs, and line plots. [Chapter 7] Interpret a line plot to solve problems involving addition, subtraction, multiplication, and division of fractions. [Chapter 7]
Making Sense in Solving Problems			
Build Skills Through Problem Solving	Build skills in addition, subtraction, multiplication, division, and measurement through problem solving.	Build skills in multiplication, division, fraction concepts, data analysis, and measurement through problem solving.	Build skills in multiplication, division, fraction concepts, decimals, geometry, data analysis, and measurement through problem solving.
Solve Real-World Problems	Solve real-world problems involving addition, subtraction, multiplication, division, and measurement.	Solve real-world problems involving addition, subtraction, multiplication, division, and measurement, including time, and money.	Solve real-world problems involving multiplication, division, concepts with whole numbers, fractions, and decimals, data analysis, and measurement.
Reasoning			
Use Appropriate Strategies and Thinking Skills to Solve Problems	Apply problem-solving strategies in Put On Your Thinking Cap! and other problem-solving activities.	Use appropriate strategies to solve real-world problems.	Use appropriate strategies to solve real-world problems.
Apply and Explain Problem Solving	Apply and explain problem-solving processes in Put On Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put On Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put On Your Thinking Cap! and other activities.
Explore Concepts	Explore concepts more deeply and justify reasoning in Let's Explore, Hands-on Activities, Put On Your Thinking Cap!, and other problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Hands-on Activities, Put On Your Thinking Cap!, and other problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Hands-on Activities, Put On Your Thinking Cap!, and other problem-solving activities.
Investigate Mathematical Ideas	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.

	Grade 3	Grade 4	Grade 5
Reasoning (continued)			
Identify, Demonstrate, and Express Regularity in Reasoning	Demonstrate the relationship between fractions on a number line and rulers marked with halves and fourths of an inch. Classify and identify two-dimensional shapes as polygons. Interpret bar graphs with scales. Create and explain multiplication and division patterns.	Demonstrate that figures and their flip, slides, and turn images are congruent. Demonstrate that some figures have rotational symmetry. Use properties of squares and rectangles to solve problems. Analyze line plots with fractions of a unit. Identify, describe, and extend numeric and nonnumeric patterns.	Examine the relationships between three-dimensional figures and the faces of the two-dimensional figures that form them. Use properties of triangles and four-sided figures to solve problems. Explain the relationships among area formulas of different polygons. Make and analyze a line plot to represent a data set of measurements in fractions of a unit. Identify, describe, and extend numeric patterns involving all operations.
Use a Variety of Reasoning Skills	Model, define, and explain properties of multiplication. Explore the inverse relationship between multiplication and division. Use estimation to check reasonableness.	Use properties of squares and rectangles to solve problems about area and perimeter. Explore the relationship between models for multiplication and division for whole numbers. Use estimation to check reasonableness (whole-number addition, subtraction, multiplication, and division).	Use properties to classify triangles and quadrilaterals. Apply understanding of models for multiplication and division of fractions and decimals by whole numbers. Use number properties (including the distributive property) to check reasonableness of results.
Communication			
Consolidate Mathematical Thinking	Present mathematical thinking through Math Journal activities.	Present mathematical thinking through Math Journal activities.	Present mathematical thinking through Math Journal activities.
Communicate with Peers, Teachers, and Others	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.
Share Mathematical Thinking	Share mathematical ideas with others during Let's Explore and Hands-on Activities.	Share mathematical ideas with others during Let's Explore and Hands-on Activities.	Share mathematical ideas with others during Let's Explore and Hands-on Activities.
Construct Arguments and Express Mathematics Ideas	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.

	Grade 3	Grade 4	Grade 5
Connections and Structure			
Look for and Use Structure to Recognize Connections in Mathematical Ideas	Apply the inverse relationship between multiplication and division. Understand that the size of a fractional part is relative to the size of the whole. Connect the units of metric capacity to one another. Recognize and apply different strategies for multiplication and division facts. Understand the relationships between the numbers in multiplication-division fact families.	Demonstrate that decimal notation is an extension of the base-ten system. Examine the relationship between fractions and decimals. Make connections among multiplication, division, factors, and multiples. Convert among mixed numbers and improper fractions.	Understand the relationship between fractions and division. Understand the relationship among fractions, and decimals, as ways to represent parts of a whole. Examine the relationships between three-dimensional figures and the two-dimensional figures that form them. Understand the relationship between fractions and division.
Understand How Concepts Build on One Another	Understand the meanings and uses of fractions including fraction of a set. Use addition, subtraction, multiplication, and division to construct and analyze graphs, frequency tables, and line plots.	Describe number relationships in context. Identify equivalent fractions and decimals. Make connections among the greatest common factor, least common multiple, and operations with fractions.	Explain the relationships among area formulas of different polygons. Identify equivalent fractions, mixed numbers, and decimals. Make connections among operations with fractions and decimals.
Solve Real-World Problems in Contexts Outside of Mathematics	Solve real-world problems involving addition, subtraction, multiplication, division, and measurement. Solve real-world problems related to money.	Solve real-world problems involving multiplication, division, fraction concepts, data analysis, and measurement.	Solve real-world problems involving multiplication, division, fraction, decimal, ratio, and percent concepts; data analysis, and measurement. Solve real-world problems involving all four operations with whole numbers, fractions, and decimals; algebra, geometry, measurement, and data analysis.

	Grade 3	Grade 4	Grade 5
Representation and Model Mathematics			
Use Representations to Attend to Precision	Use place-value models to read, write, and represent numbers to 10,000. Represent numbers in different equivalent forms. Use the dollar sign and decimal point in money amounts. Solve addition and subtraction problems with greater numbers by using a bar model. Use the ×, ÷, and = symbols to represent multiplication and division situations. Represent multiplication with skip counting, dot paper arrays, and bar models. Represent division as repeated subtractions. Use a variety of representations for multiplication and division, such as arrays, area models, number lines, grouping, and sharing. Determine the missing parts (quantities or symbols) in number sentences. Create and analyze multiplication and division patterns. Identify a rule for number and counting patterns.	Represent numbers to 100,000 in various contexts. Write numbers to 100,000 in standard, expanded, and word forms. Model decimals to tenths and hundredths. Write addition and subtraction number sentences for real-world problems with fractions and decimals. Use models to show relationships between improper fractions and mixed numbers. Apply understanding of models for multiplication and division. Define and use symbols in geometry to identify and relate geometric figures. Use a variety of models to represent multi-step real-world problems with whole numbers, fractions, and decimals. Use geometry tools (protractor, set squares, grid paper) to model problems. Write addition and subtraction number sentences for real-world problems with fractions and decimals. Use a rule to describe a sequence of numbers or objects.	Explore negative numbers in context. Write numbers to 10,000,000 in various forms. Model decimals to thousandths. Use letters as variables to represent unknown values in equations and formulas. Convert fractions and mixed numbers to decimals and decimals to fractions and mixed numbers. Interpret symbols of relation in comparing whole numbers, fractions, and decimals. Use a variety of models for multiplication and division of fractions and decimals by whole numbers. Use the order of operations in numeric expressions with two or more operations and grouping symbols. Write and solve equations. Use a coordinate grid to represent an equation as a graphed line. Understand the relationships between the numbers and symbols in formulas for area and volume. Find rules to complete number patterns.

	Grade 3	Grade 4	Grade 5
Representation and Model Mathematics (continued)			
Select and Apply Appropriate Models and Tools to Represent Problems	Use a variety of models to represent fractions and equivalent fractions. Use a variety of concrete, pictorial, and symbolic models and tools for multi-digit addition, subtraction, multiplication, and division. Represent multiplication with skip counting and arrays. Use measuring tools to measure weight and capacity. Use technology (virtual manipulatives and computers) to model and draw.	Translate between equivalent improper fractions and mixed numbers. Use a variety of models for multi-digit multiplication and division of whole numbers. Use technology (virtual manipulatives and computers) to model and draw.	Translate among fractions, mixed numbers, and decimals. Find the most useful form of the quotient. Use a variety of models and tools for multiplication and division of fractions and decimals by whole numbers. Use technology (virtual manipulatives and computers) to model and draw.
Interpret Phenomena Through Representations	Use referents to estimate length, capacity, and weight. Measure lengths to the nearest half inch and quarter inch. Use frequency tables, bar graphs, picture graphs, and line plots to solve problems. Represent measurement data using a line plot where the horizontal scale is marked in whole numbers, halves, or quarters. Solve real-world problems involving social situations. Solve real-world problems related to money.	Measure perimeter and area in customary and metric units. Collect data and organize it in a table. Create a line graph from data in a table. Interpret a line plot to solve problems involving addition and subtraction of fractions. Solve real-world problems involving multiplication, division, fraction concepts, data analysis, and measurement.	Measure volume of a rectangular prism. Generate a line plot to represent measurement data. Make a table of values from an equation, and plot the points these ordered pairs form in the coordinate plane. Solve real-world problems involving whole number, fraction, and decimal operations, algebra, data analysis, and measurement.

Scope and Sequence Courses 1–3

Articulated Sequence

Math in Focus® answers the call for a coherent sequence of topics giving students time to master foundational topics, so that little repetition is required the next year.

- **"Missing topics"** When a topic appears to be "missing," you can be assured that it is found in either an earlier or later grade level. For example, you will find place-value concepts in Grade 5, but not repeated in Course 1.
- **More advanced:** As a result of not repeating topics year after year, students who use ***Math in Focus***® will advance faster than students in other programs. As a result, you may find topics that appear to be "too advanced." However, you will find that your students are able to easily handle the challenge as long as they have had the appropriate preliminary instruction.

Preparation for Algebra

Math in Focus® answers the call to prepare students for Algebra. The ***Math in Focus***® sequence of topics emphasizes:

- **Number sense:** In Course 1, integers and integer comparisons are introduced using the number line. Course 2 introduces rational numbers and focuses on computations with rational numbers.
- **Fractions, ratios, and proportional reasoning:** In-depth work with fractions in Grade 5 provides a solid foundation for mastery of ratios, rates, and proportions in Courses 1 and 2.
- **Problem solving:** Challenging problem solving is built into each chapter in every grade level. Multiple representations such as bar models, number lines, manipulatives or concrete models, tables, and graphs lead students to the use of variables in algebraic expressions, equations, and inequalities.

Developmental Continuum for Algebra

Grade 5	Course 1	Course 2	Course 3
Concepts and skills development through hands-on instruction and practice			
• multiplication and division algorithms for whole numbers • using model drawings to solve problems involving whole numbers and fractions • mental math			
Emphasis on problem solving, skill consolidation and deep understanding in preparation for algebra			
	• exponents and order of operation • multiplying and dividing fraction and decimals • understanding and using ratios, rates, and percents • using model drawings to solve problems involving ratios, rates, and percents	• operations with rational numbers • order of operations	
Introductory algebraic concepts in preparation for a first course in algebra			
	• variable in algebraic expressions • relating model drawing to algebraic expressions • using geometric formulas for area to write linear equations	• solving multi-step equations involving fractions and decimals • solving inequalities • solving and graphing proportional relationships • using area and volume formulas to write equations	• using the laws of exponents, including zero and negative exponents • writing and sketching lines in slope-intercept form • solving problems involving functions, systems of linear equations, and Pythagorean Theorem

	Course 1	Course 2	Course 3
Number and Operations			
Sets and Numbers	Understand that positive and negative numbers can be used to describe quantities having opposite directions or values. [Chapter 2] Use positive and negative numbers to represent quantities in real-world contexts. [Chapter 2] Understand rational numbers as points on the number line. [Chapter 2] Extend number lines to represent points with negative coordinates; locate negative integers on a horizontal or vertical number line. [Chapters 2 and 9] Use negative numbers to identify and locate points in all four quadrants of the coordinate plane. [Chapter 9] Understand that the absolute value of a number is its distance from 0 on the number line. [Chapter 2] Interpret the absolute value of a rational number as magnitude for a positive or negative quantity in a given context. [Chapter 2]	Know that the set of positive and negative fractions, along with 0, make up the rational number system. [Chapter 1] Understand that the decimal representation of a rational number is either terminating or repeating. [Chapter 1]	Know that numbers that are not rational are called irrational. [Chapter 1] Understand that some numbers, such as π or $\sqrt{2}$, are irrational. [Chapter 1] Know that the set of real numbers is composed of the two distinct sets: rational numbers and irrational numbers. [Chapter 1]
Number Representation	Represent fractions, decimals and integers on a number line. [Chapter 2] Relate the square of a whole number to the area of a square, and the cube of a number to the volume of a cube. [Chapter 1] Find the square or cube of a number. [Chapter 1] Find the square root or cube root of a perfect square or perfect cube, up to 150. [Chapter 1]	Write rational numbers as terminating or repeating decimals. [Chapter 1]	Write the prime factorization of a number using exponential notation. [Chapter 2] Represent numbers in scientific notation. [Chapter 3] Interpret numbers in scientific notation that have been generated by technology. [Chapter 3] Represent irrational numbers on the number line using their decimal approximations. [Chapter 1] Approximate numbers to a given number of significant digits. [Chapter 1]

	Course 1	Course 2	Course 3
Number and Operations (continued)			
Compare and Order	Write, interpret, and explain statements of order for fractions and integers. [Chapter 2] Interpret statements of inequality as statements about the relative position of two numbers on a number line. [Chapter 8] Distinguish comparisons of absolute value from statements about order. [Chapter 2]	Compare two rational numbers using their decimal expansions. [Chapter 1]	Compare irrational numbers using their rational approximations. [Chapter 1] Compare the relative sizes of two measurements expressed in exponential notation or in scientific notation. [Chapters 2 and Chapter 3]
Place Value			Write numbers in scientific notation. [Chapter 3] Round a number to a given number of significant digits. [Chapter 1]
Fraction Concepts		Write rational numbers in $\frac{m}{n}$ form, where m and n are integers. [Chapter 1]	
Decimal Concepts		Write rational numbers as decimals. [Chapter 1] Understand that the decimal representation of a rational number is either terminating or repeating. [Chapter 1]	Approximate the decimal form of an irrational number using rounding. [Chapter 1]
Whole Number Computation: Multiplication and Division Algorithms			Identify the number of significant digits in a whole number, decimal number, or measurement. [Chapter 1] Compute with very large and very small numbers written in scientific notation. [Chapter 3] Solve real-world problems that involve calculations using scientific notation. [Chapter 3]

	Course 1	Course 2	Course 3
Number and Operations (continued)			
Fraction Computation	Interpret and compute quotients of fractions. [Chapter 3] Represent situations involving multiplication and division of fractions using models, such as bar models and area models. [Chapter 3] Solve real-world problems involving division of fractions by fractions. [Chapter 3]	Extend multiplication of fractions to include multiplication of rational numbers. [Chapter 1] Interpret the sum, product, or quotient of two rational numbers in a real-world context. [Chapter 1]	
Decimal Computation	Fluently multiply and divide multi-digit decimals using standard algorithms. [Chapter 3] Represent situations involving multiplication and division of decimals using models, such as bar models and area models. [Chapter 3] Solve problems by multiplying and dividing decimals, interpreting remainders to suit the context of the problem. [Chapter 3]	Solve real-world problems involving all four operations with rational numbers. [Chapter 1]	Compute with very large and very small numbers written in scientific notation. [Chapter 3] Solve real-world problems that involve calculations using scientific notation. [Chapter 3]
Estimation and Mental Math	Estimate answers to percent problems to check for reasonableness. [Chapter 6]	Solve real-world and mathematical problems and assess reasonableness of answers using estimation and mental math strategies. [Chapter 1]	
Computations with Rational Numbers: Addition and Subtraction		Describe situations in which opposite quantities combine to make 0. [Chapter 1] Understand the sum $p + q$ as the number located at a distance $\|q\|$ from p. [Chapter 1] Understand subtraction of a rational number as adding its inverse. [Chapter 1] Find the distance between two numbers on a number line using absolute value. [Chapter 1] Solve real-world problems involving addition and subtraction with rational numbers. [Chapter 1]	

	Course 1	Course 2	Course 3
Number and Operations (continued)			
Computations with Rational Numbers: Addition and Subtraction (continued)		Interpret the sum of two rational numbers in a real-world context. [Chapter 1]	
Computations with Rational Numbers: Multiplication and Division		Apply properties of operations to multiply and divide rational numbers. [Chapter 1] Understand that the quotient of any two integers a and b is the rational number $\frac{a}{b}$ ($b \neq 0$). [Chapter 1] Understand that $-\left(\frac{p}{q}\right) = \frac{(-p)}{q} = \frac{p}{(-q)}$. [Chapter 1] Solve real-world problems involving multiplication and division of rational numbers. [Chapter 1] Interpret the product or quotient of two rational numbers in a real-world context. [Chapter 1]	
Algebra / Expressions and Equations			
Patterns		Use a number pattern to explore multiplication of negative numbers. [Chapter 1]	Use number patterns as a context for generating equations in two variables. [Chapter 5]
Properties	Use the distributive property to factor the sum of two whole numbers, or algebraic terms with whole-number coefficients. [Chapter 7]	Use the properties of real numbers to add and subtract rational numbers. [Chapter 1] Use the properties of real numbers to extend multiplication and division of fractions to multiplication and division of rational numbers. [Chapter 1] Use the distributive property to show that $(-1)(-1) = 1$. [Chapter 1] Apply properties of real numbers to add, subtract, factor, and expand algebraic expressions with rational coefficients. [Chapter 2]	Apply properties of real numbers to manipulate variables when solving linear equations in two variables. [Chapter 4]

	Course 1	Course 2	Course 3
Algebra / Expressions and Equations (continued)			
Number Theory	Write a composite number as a product of its prime factors. [Chapter 1] Find the greatest common factor or least common multiple of two whole numbers. [Chapter 1]		Write the prime factorization of a number using divisibility rules and exponential notation. [Chapter 2]
Functional Relationships	Use variables to write equations representing two real-world quantities that change in relation to one another. [Chapters 7 and 8] Analyze the relationship between an independent and dependent variable using graphs, tables, and equations. [Chapter 9]		Understand that a function is a rule that assigns to each input exactly one output. [Chapter 7] Represent functions algebraically, in tables, and in graphs. [Chapter 7] Know that the graph of a function is the set of ordered pairs consisting on an input and its corresponding output. [Chapter 7] Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [Chapter 7] Interpret the equation $y = mx + b$ as defining a linear function. [Chapter 7] Determine and interpret the rate of change and initial value of a function from the context or data. [Chapter 7] Give examples of functions that are not linear. [Chapter 7] Construct a function to model a linear relationship between two quantities. [Chapter 7] Create function tables using a spreadsheet. [Chapter 7] Represent a direct proportion as a function table, an equation, and a graph. [Chapter 7] Represent an inverse proportion using a function table (with an appropriate range), an equation, and a graph. [Chapter 7]

	Course 1	Course 2	Course 3
Algebra / Expressions and Equations (continued)			
Expressions / Models	Write and evaluate numerical expressions and geometric formulas involving whole-number exponents. [Chapters 10 and 11] Write and evaluate algebraic expressions using the order of operations. [Chapter 7] Identify parts of an expression using terms such as sum, term, product, and coefficient. [Chapter 7] Use the properties of addition and multiplication to write equivalent expressions, including factoring a common factor from a sum. [Chapter 7] Identify equivalent expressions and like and unlike terms of an expression. [Chapter 7] Solve problems using variable expressions in real-world contexts. [Chapters 7 and 8]	Apply properties of real numbers to add, subtract, factor, and expand algebraic expressions with rational coefficients. [Chapter 2] Represent an expression in equivalent forms to help solve a problem. [Chapter 2] Represent an expression using a bar model. [Chapter 2]	Write equivalent expressions by knowing and applying the following properties of integer exponents. [Chapter 2] • the product and quotient of powers • the power of powers • the powers of products and quotients • zero and negative exponents Write two numbers in scientific notation to compare their relative sizes. [Chapter 3]
Number Sentences and Equations	Use substitution to identify value(s) that make an equation or inequality true. [Chapter 8]	Identify equivalent equations. [Chapter 3]	Use square root and cube root radicals to represent solutions to equations. [Chapter 2] Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. [Chapter 4]
Equality and Inequality	Write and solve addition and multiplication equations to solve real-world problems. [Chapters 3, 4, 5, 6, 7, and 8] Write and evaluate an inequality of the form $x < c$ or $x > c$ to represent a real-world situation. [Chapter 8] Recognize that an inequality of the form $x < c$ or $x > c$ has an infinite number of solutions and represent the solutions on a number line. [Chapter 8]	Write equivalent equations using properties of equality. [Chapter 3] Solve two-step equations of the form $ax + b = c$ and $a(x + b) = c$. [Chapter 3] Solve inequalities using addition, subtraction, multiplication, or division. [Chapter 3] Solve word problems that lead to inequalities of the form $ax + b > c$ or $ax + b < c$. [Chapter 3]	Solve linear equations with rational coefficients, including equations that require expanding and collecting like terms. [Chapter 4] Identify the slope, x-intercept, and y-intercept of a linear equation. [Chapter 5] Sketch the graph of a linear equation and write a linear equation from a graph or set of data. [Chapter 5]

	Course 1	Course 2	Course 3
Algebra / Expressions and Equations (continued)			
Equality and Inequality (continued)		Graph the solution set of an inequality in one variable on a number line and interpret it in the context of a real-world problem. [Chapter 3]	Know that the solutions to a system of linear equations in two variables correspond to points of intersection of their graphs. [Chapter 6] Solve systems of two linear equations in two variables algebraically. [Chapter 4] Estimate the solution of a system of two linear equations in two variables graphically. [Chapter 5] Solve real-world problems leading to two linear equations in two variables. [Chapter 5] Identify inconsistent and dependent systems of equations. [Chapter 6]
The Coordinate Plane	Use negative numbers to identify and locate points in all four quadrants of the coordinate plane. [Chapter 9] Find the length of horizontal and vertical segments in the coordinate plane. [Chapter 9] Use tables and graphs to represent linear equations. [Chapter 8] Solve real-world problems by graphing points in all four quadrants of the coordinate plane. [Chapter 9] Plot pairs of equivalent rates represented in the coordinate plane. [Chapter 9] Draw polygons in the coordinate plane given the coordinates of the vertices. [Chapter 9]	Explain what the points (x, y), $(0, 0)$, and $(0, c)$ mean in a given proportional context. [Chapter 4] Find the constant of proportionality for quantities that vary directly or inversely from their graphs. [Chapter 4]	Graph proportional relationships, interpreting the unit rate as the slope of the graph. [Chapter 5] Define the slope of a line as the ratio of the vertical change to the horizontal change of the line. [Chapter 5] Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. [Chapter 10] Know that the solutions to a system of linear equations in two variables correspond to points of intersection of their graphs. [Chapter 6] Estimate solutions to systems of two linear equations in two variables graphically. [Chapter 6] Know that the graph of a function is the set of ordered pairs consisting of an input and its corresponding output. [Chapter 7]

	Course 1	Course 2	Course 3
Algebra / Expressions and Equations (continued)			
The Coordinate Plane (continued)			Know that the graph of a linear function, given by an equation of the form $y = mx + b$, is a straight line. [Chapter 7] Interpret the graph of a nonlinear function as a curve. [Chapter 7] Sketch the graph of a relationship whose verbal description has given qualities. [Chapter 7] Find the image of a figure in the coordinate plane under a translation, rotation, reflection, or dilation. [Chapter 9] Apply the Pythagorean theorem to find the distance between two points in the coordinate plane. [Chapter 8]
Geometry			
Lines and Angles	Find the lengths of horizontal and vertical segments on a coordinate plane. [Chapter 9]	Identify supplementary and complementary angles. [Chapter 5] Use supplementary, complementary, vertical, and adjacent angles to write and solve simple equations for unknown angle measures. [Chapter 5] Identify parallel lines and their transversals. [Chapter 5] Identify and use corresponding angles, alternate exterior angles, and alternate interior angles formed from parallel lines and a transversal to solve problems. [Chapter 5] Use properties of interior angles and exterior angles of a triangle and the related sums. [Chapter 5]	Find the images of lines, angles, and parallel lines under rotations, reflections, and translations. [Chapter 9]

	Course 1	Course 2	Course 3
Geometry (continued)			
Two-Dimensional Shapes / Polygons	Identify regular polygons. [Chapter 9] Draw polygons in the coordinate plane given the coordinates of the vertices. [Chapter 9] Use coordinates to find the length of horizontal or vertical sides of polygons. [Chapter 9]	Solve problems involving drawings of geometric figures. [Chapter 6] Construct a unique triangle given the lengths of its three sides, or the lengths of two sides and the measure of one angle, or the measures of two angles and the length of the included side. [Chapter 6] Know that no triangle is possible if, given the lengths of the three sides, the sum of any two of them is less than or equal to the length of the third side. [Chapter 6]	Explain a proof of the Pythagorean theorem and its converse. [Chapter 8] Use the Pythagorean theorem to find unknown side lengths in right triangles in real-world problems. [Chapter 8] Use the converse of the Pythagorean theorem to determine whether a triangle is a right triangle. [Chapter 8]
Three-Dimensional Shapes / Solid Figures		Find cross sections and volumes of right rectangular prisms and right pyramids. [Chapter 7]	Apply the Pythagorean theorem to find the slant height of pyramids and cones, or the length of diagonals in prisms. [Chapter 8]
Congruence and Symmetry			Understand that two figures are congruent if one can be moved onto the other by a series of translations, reflections, and rotations. [Chapter 10] Understand that two figures are similar if one can be moved onto the other by a series of translations, reflections, rotations, and dilations. [Chapter 9] Given two congruent or similar figures in a plane, find a sequence of transformations that moves one onto the other. [Chapter 9] Establish the constant of proportionality in similar figures. [Chapter 10] Establish through informal arguments the AA similarity theorem for triangles. [Chapter 10]

	Course 1	Course 2	Course 3
Geometry (continued)			
Transformations			Verify experimentally that rotations, reflections, and translations preserve lengths, angle measures, parallelism and perpendicularity. [Chapter 9] Find the image of a figure in the coordinate plane under a translation, rotation, reflection, or dilation. [Chapter 9] Understand that two figures are congruent if one can be moved onto the other by a series of translations, reflections, and rotations. [Chapter 9] Understand that two figures are similar if one can be moved onto the other by a series of translations, reflections, rotations, and dilations. [Chapter 9] Given two congruent or similar figures in a plane, find a sequence of transformations that moves one onto the other. [Chapter 9]
Circles		Identify the center, radius, diameter, and circumference of a circle. [Chapter 7] Explore the relationship between the diameter of a circle and its circumference. [Chapter 7] Solve real-world problems involving rates and circles. [Chapter 7]	
Measurement			
Perimeter / Perimeter and Circumference		Understand how the formula for the circumference of a circle is derived. [Chapter 7] Use a formula to calculate the circumference of circles, semicircles, and quarter circles. [Chapter 7] Solve problems involving the circumference of circles. [Chapter 7]	

	Course 1	Course 2	Course 3
Measurement (continued)			
Area	Find the area of triangles, parallelograms, trapezoids, and regular polygons by decomposing into rectangles or triangles. [Chapter 10] Find a missing dimension of a plane figure given its area and other dimension(s). [Chapter 10] Solve real-world problems involving the areas of triangles, parallelograms, trapezoids, and regular polygons. [Chapter 10]	Solve problems involving the areas of triangles, quadrilaterals, and other polygons. [Chapter 7] Compute lengths and areas for a real figure from its scale drawing. [Chapter 7] Understand how the formula for the area of a circle is derived. [Chapter 7] Use a formula to calculate areas of circles, semicircles, and quadrants. [Chapter 7]	
Surface Area and Volume	Represent prisms and pyramids with triangular or rectangular faces using nets. [Chapter 10] Use nets of prisms and pyramids to find the surface areas. [Chapter 10] Find the volume of a rectangular prism with fractional edge lengths, and relate this to the formula $V = \ell wh$. [Chapter 10] Find the volume of nonrectangular prisms using the formulas $V = Bh$. [Chapter 10] Solve real-world problems involving surface area and volume of prisms. [Chapter 11]	Find the volume of a pyramid, by relating it to a prism with the same base and height. [Chapter 7] Solve problems involving the surface area and volume of figures composed of cubes and right prisms. [Chapter 7]	Apply the Pythagorean theorem to finding the slant height of pyramids and cones and finding their surface areas. [Chapter 11]

	Course 1	Course 2	Course 3
Ratios and Proportional Relationships			
Ratios	Understand the concept of ratio and use ratio language to describe proportional relationships. [Chapter 4] Find the missing term in a pair of equivalent ratios or in a rate table. [Chapter 4] Plot pairs of equivalent rates in the coordinate plane. [Chapter 4] Use tables to compare ratios. [Chapter 4] Solve multi-step real-world problems involving ratios using bar models. [Chapter 4]	Compute unit rates where the terms are given in fractional units. [Chapter 4] Explore the relationship between two quantities that vary directly or inversely. [Chapter 4] Solve problems involving scale drawings. [Chapter 6] Use proportional reasoning to solve multi-step ratio and percent problems. [Chapter 4]	Define the slope of a line as the ratio of the vertical change to the horizontal change of the line. [Chapter 5]
Representing Ratios	Use multiplication or division to write equivalent ratios. [Chapter 4] Make tables of equivalent ratios, including whole number measurements. [Chapter 4] Use bar models to solve problems involving ratios of three quantities. [Chapter 4]	Represent quantities that vary directly or indirectly using equations or graphs from verbal descriptions. [Chapter 4] Find the constant of proportionality for quantities that vary directly or inversely from tables, graphs, verbal descriptions, or diagrams, such as scale drawings. [Chapters 4 and 6] Explain what the points (x, y), $(0, 0)$, and $(1, c)$ mean in the graph of a given proportional context. [Chapter 4]	Graph proportional relationships, interpreting the unit rate as the slope of the graph. [Chapter 5] Compare two different proportional relationships represented in different ways. [Chapter 5] Establish the constant of proportionality in similar figures. [Chapter 10] Use scales and scale factors to solve problems related to scale drawings and scale models. [Chapter 10]
Rates	Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a : b$ $(b \neq 0)$, and use rate language in proportional situations. [Chapter 5] Compute and compare unit rates using the division algorithm. [Chapter 5] Solve unit rate problems, including unit pricing and constant speed. [Chapter 5]	Recognize that a constant of proportionality can be a unit rate. [Chapter 4]	Relate unit rate to slope. [Chapter 5]

	Course 1	Course 2	Course 3
Ratios and Proportional Relationships (continued)			
Percents	Solve percent problems involving simple interest, tax, markups, discounts, and commissions. [Chapter 6] Convert fractions to percents. [Chapter 6] Find a percent of a number. [Chapter 6]	Solve multi-step percent problems involving percent increase and decrease. [Chapter 4] Solve problems involving percent, including finding the whole when the percent and its quantity are known. [Chapter 4] Solve problems involving simple interest, sales tax, markups, and markdowns. [Chapter 4]	
Data Analysis / Statistics and Probability			
Classifying and Sorting	Represent data in frequency tables, dot plots and histograms. [Chapter 12] Display a data set in a box plot. [Chapter 13]		Represent bivariate data in a scatter plot. [Chapter 12]
Interpret / Analyze Data	Recognize a statistical question. [Chapter 12] Understand that a data set has a distribution, which can be described by its center and shape. [Chapter 13] Recognize that a measure of center summarizes all values of a data set with a single number. [Chapter 13] Identify measures of center of a data set and calculate each, and know when each is most useful. [Chapter 13] Describe the overall shape of a distribution, and relate the choice of a center to the shape of the distribution. [Chapter 13] Solve real-world problems involving the mean or median, such as finding a missing data value given the mean. [Chapter 13]	Understand that a sample can be used to gather information about a population. [Chapter 8] Understand that a sample can be generalized to a population only if it is representative of the population. [Chapter 8] Know that a random sample usually produces a representative sample. [Chapter 8] Use data from a random sample to make a prediction about the population. [Chapter 8] Use several samples of the same size to judge the variation in the predictions obtained. [Chapter 8] Relate the variability of a sample to the shape of the data set, and to the context in which the data were collected. [Chapter 8]	Interpret the relationship between two data sets shown in a scatter plot. [Chapter 12] Describe patterns of clustering, outliers, linear or nonlinear association displayed by a scatter plot. [Chapter 12] For scatter plots that suggest a linear relationship, informally fit a straight line to the data. [Chapter 12] Assess how well a "line of best fit" represents the data shown in a scatter plot. [Chapter 12] Use the equation of a linear model to solve problems in the context of the data, including interpreting the slope and intercept. [Chapter 12] In two-ways tables, identify and analyze patterns of association displayed in the frequencies and relative frequencies. [Chapter 12]

	Course 1	Course 2	Course 3
Data Analysis / Statistics and Probability (continued)			
Interpret / Analyze Data (continued)	Compute measures of variability for a data set: quartiles, interquartile range and mean absolute deviation. [Chapter 13]	Use measures of center and variability to compare two populations. [Chapter 8]	
Outcomes		Use a Venn diagram to illustrate sample spaces and events. [Chapter 8] Identify the outcomes of a sample space that make up an event, when the event is stated in everyday language. [Chapter 8] Represent the outcomes of compound events using organized lists or tree diagrams. [Chapter 9]	
Expressing Probability		Know that the probability of an event is a number between 0 and 1 inclusive. [Chapter 8] Find the probability of complementary and mutually exclusive events. [Chapter 8] Approximate the probability of a chance event using an appropriate sampling technique. [Chapter 8] Compute the approximate relative frequency of a chance event from its probability. [Chapter 8] Develop a sampling technique (probability model) for equally likely events. [Chapter 8] Develop a sampling technique (probability model) for events that are not equally likely. [Chapter 8] Compare the theoretical and experimental probabilities of an event. [Chapters 8 and 9] Design and use a simulation to generate frequencies for a chance process. [Chapters 8 and 9]	

	Course 1	Course 2	Course 3
Data Analysis / Statistics and Probability (continued)			
Expressing Probability (continued)		Use tree diagrams and multiplication to find the probabilities of dependent and independent events. [Chapter 9] Represent nonmutually exclusive events using Venn diagrams. [Chapter 8]	
Making Sense in Solving Problems			
Build Skills Through Problem Solving	Build skills in multiplication and division of fractions and decimals, ratios, and percents; algebra, data analysis, and geometry and measurement through problem solving.	Build skills in operations with integers and rational numbers; proportionality, measurement, statistics, and probability through problem solving.	Build skills in operations with integers and rational numbers; proportionality, measurement, statistics, and probability through problem solving.
Solve Real-World Problems	Solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry, and measurement.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.
Reasoning			
Use Appropriate Strategies and Thinking Skills to Solve Problems	Discuss mathematical ideas, use appropriate strategies, solve real-world problems, and explain solution methods in class.	Discuss mathematical ideas, use appropriate strategies, solve real-world problems, and explain solution methods in class.	Discuss mathematical ideas, use appropriate strategies, solve real-world problems, and explain solution methods in class.
Apply and Explain Problem Solving	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.
Explore Concepts	Explore concepts more deeply and justify reasoning in Let's Explore, Put on Your Thinking Cap!, and other problem solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Put on Your Thinking Cap!, and other problem solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Put on Your Thinking Cap!, and other problem solving activities.
Investigate Mathematical Ideas	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.

	Course 1	Course 2	Course 3
Reasoning (continued)			
Identify, Demonstrate, and Express Regularity in Reasoning	Continue to use bar models to solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry and measurement. Apply the properties of operations to generate equivalent numerical and algebraic expressions. Apply standard algorithms for addition, subtraction, multiplication, and division of whole numbers and decimals. Apply standard algorithms for multiplication and division with fractions. Apply concept of prime factorization to finding square roots and cube roots of perfect squares and perfect cubes. Develop and apply formulas for finding the area of triangles, parallelograms, trapezoids, and regular polygons. Develop and apply other formulas such as the distance formula.	Continue to use number lines, coordinate grids, and other visual models to solve real-world problems involving rational numbers, proportionality, geometry, measurement, probability, and statistics. Apply the properties of operations to generate equivalent numerical and algebraic expressions. Extend algorithms for decimals to include rational numbers. Extend algorithms for fraction operations to operations with positive and negative rational fractions. Apply properties of operations and factorization to factor algebraic expressions with rational coefficients. Develop and apply formula for the volume of pyramids. Develop a probability model and use it to find probabilities of events.	Continue to use number lines, coordinate grids, and other visual models to solve real-world problems involving rational and irrational numbers, functions, proportionality, algebra, geometry, measurement, probability, and statistics. Compute with very large and very small numbers written in scientific notation. Know and apply the properties of integer exponents to write equivalent expressions. Apply properties of real numbers to manipulate variables when solving linear equations in two variables. Define the slope of a line as the ratio of the vertical change to the horizontal change of the line. Interpret the equation $y = mx + b$ as defining a linear function. Interpret the graph of a nonlinear function as a curve. Establish the constant of proportionality in similar figures. Explain a proof of the Pythagorean theorem and its converse. Use the Pythagorean theorem to find unknown side lengths and slant heights in right triangles, pyramids, and cones. Understand that if two figures are related by a scale factor of k, then their areas are related by a scale factor of k^2.

	Course 1	Course 2	Course 3
Reasoning (continued)			
Use a Variety of Reasoning Skills	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. Apply the properties of operations to generate equivalent numerical and algebraic expressions.	Use activities to describe what a chance process is and explain the discrepancy between relative frequency and probability. Apply the properties of operations to add, subtract, multiply, and divide rational numbers in numerical and algebraic operations.	Interpret scientific notation that has been generated by technology. Describe qualitatively the functional relationship between two quantities by analyzing a graph. Verify experimentally the properties of rotations, reflections, and translations. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.
Communication			
Consolidate Mathematical Thinking	Present mathematical thinking through Math Journal activities, Math Talk, and class discussions.	Present mathematical thinking through Math Journal activities, Math Talk, and class discussions.	Present mathematical thinking through Math Journal activities, Math Talk, and class discussions.
Communicate with Peers, Teachers, and Others	Discuss mathematical ideas with others during Let's Explore activities. Work in pairs or groups in Let's Explore, Project Work, and other activities.	Discuss mathematical ideas with others during Let's Explore activities. Work in pairs or groups in Let's Explore, Project Work, and other activities.	Discuss mathematical ideas with others during Let's Explore activities. Work in pairs or groups in Let's Explore, Project Work, and other activities.
Share Mathematical Thinking	Share mathematical ideas with others during Let's Explore and other activities.	Share mathematical ideas with others during Let's Explore and other activities.	Share mathematical ideas with others during Let's Explore and other activities.
Construct Arguments and Express Mathematics Ideas	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.

	Course 1	Course 2	Course 3
Connections and Structure			
Look for and Use Structure to Recognize Connections in Mathematical Ideas	Relate ratios, fractions, and rates. Understand that ratios can represent part-to-part as well as part-to-whole relationships. Convert among fractions, decimals, and percents.	Show that a number and its opposite have a sum of 0. Examine the relationships among integers and rational numbers. Extend understanding of operations with fractions to operations with positive and negative rational numbers. Extend understanding of operations with numerical terms to operations with algebraic terms. Convert among various forms of rational numbers depending on the real-world or mathematical situation. Describe the two-dimensional figures that result from slicing three-dimensional figures.	Relate unit rate to slope. Apply properties of real numbers to manipulate variables when solving linear equations in two variables. Use number patterns as a context for generating equations in two variables. Construct a function to model a linear relationship between two quantities. Use similar triangles to explain why the slope *m* is the same between any two distinct points on a nonvertical line in the coordinate plane. Use experiments to describe the effects of transformations on congruent and similar figures. Interpret the relationship between two data sets shown in a scatter plot. In two-way tables, identify and analyze patterns of association displayed in the frequencies and relative frequencies.
Understand How Concepts Build on One Another	Make connections between ratios, fractions, and rates. Make connections between squares and square roots, cubes and cube roots.	Make connections between operations with integers and rational numbers. Make connections between operations with numerical and algebraic terms. Examine the relationships between the nets of prisms and their surface areas. Examine the relationships between cross-sections of prisms and their volumes.	Examine the relationships between the net of solids and their surface areas. Examine the relationships between cross-sections of cylinders and their volumes.
Solve Real-World Problems in Contexts Outside of Mathematics	Solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry, and measurement.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.

	Course 1	Course 2	Course 3
Representation and Model Mathematics			
Use Representations to Attend to Precision	Translate between fractions, decimals, ratios, and percents. Select the most useful form (fraction or decimal) for solving problems involving percents. Use a variety of models to solve problems involving ratios, rates, and percents. Use visual models (area models, sets, and number line drawings) to represent problems involving fractions, decimals, ratios, rates, and percents. Use part/whole, comparison, and before and after bar models to represent multi-step real-world problems with whole numbers, fractions, decimals, ratios, rates, and percents. Measure distances in the coordinate plane. Use nets to find the surface areas of pyramids and prisms. Represent data in dot plots and histograms. Display numerical data in plots on a number line, including line plots, dot plots, and histograms.	Translate among the various forms for rational numbers. Select the most useful form of a rational number to solve real-world and mathematical problems. Use activities with various models to understand sampling, chance, and probability. Use various models to solve multi-step real-world problems involving integers, equations, inequalities, proportions, scale drawings, formulas, probability, and statistics. Solve problems involving scale drawings of geometric figures, including measuring actual lengths and areas. Identify the constant of proportionality in scale drawings and other diagrams. Show how to use a random number table to simulate random samples. Display data in line plots, dot plots, box plots, Venn diagrams, and histograms. Use overlapping data distributions to measure the difference between two populations. Find probabilities for compound events using organized lists or tables. Use tree diagrams and multiplication to find the probabilities of dependent and independent events. Represent nonmutually exclusive events using Venn diagrams. Design and use a simulation to generate frequencies for compound events.	Know and apply the properties of integer exponents to write equivalent expressions. Use square root and cube root radicals to represent solutions to equations. Write two numbers in scientific notation to compare their relative sizes. Sketch the graph of a linear equation and write a linear equation from a graph or set of data. Use similar triangles to explain why the slope *m* is the same between any two distinct points on a nonvertical line in the coordinate plane. Use the Pythagorean theorem to find unknown side lengths in right triangles in real-world problems. Define and illustrate transformations, using graphs, geometric software and diagrams, the properties of translations, reflections, rotations, and dilations. Describe patterns of clustering, outliers, linear or nonlinear association displayed by a scatter plot.

	Course 1	Course 2	Course 3
Representation and Model Mathematics (continued)			
Select and Apply Appropriate Models and Tools to Represent Problems	Use geometry tools (protractor, set squares, grid paper) to model problems. Use technology (virtual manipulatives and computers) to model and draw. Select appropriate formulas and units in solving problems involving perimeter, area, surface area, and volume. Use a calculator to model, compute, and solve.	Use geometry tools (protractor, set squares, grid paper) to model problems. Use technology (virtual manipulatives and computers) to model and draw. Use tools such as rulers, protractors, and technology to draw geometric figures with given conditions. Use geometry tools to construct triangles. Select appropriate formulas and units in solving problems involving perimeter, area, surface area, and volume. Use a calculator to model, compute, and solve problems involving rational numbers.	Use geometry tools (protractor, set squares, grid paper) to model problems. Use technology (virtual manipulatives and computers) to model and draw. Use a calculator to model, compute, and solve problems involving rational and irrational numbers. Interpret numbers in scientific notation that have been generated by technology. Solve real-world problems that involve calculations with very large and very small numbers using scientific notation. Verify experimentally the properties of rotations, reflections, and translations regarding the images of lines, angles, and parallel lines.
Interpret Phenomena Through Representations	Write the square and cube of a whole number using indices. Represent negative numbers on a number line and in the coordinate plane. Represent solutions of inequalities on a number line. Understand absolute value of a rational number as its distance from 0 on a number line. Find equivalent ratios and rates.	Introduce integers and rational numbers and their definitions. Map rational numbers on the number line. Understand subtraction of rational numbers as adding the additive inverse. Use the laws of equality to write equivalent equations.	Write numbers in exponential notation. Interpret numbers in scientific notation that have been generated by technology. Apply properties of real numbers to manipulate variables when solving linear equations in two variables. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. Represent functions algebraically, in tables, and in graphs. Construct a function to model a linear relationship between two quantities.

Scope and Sequence Course 2 Accelerated

Articulated Sequence

Math in Focus® answers the call for a coherent sequence of topics giving students time to master foundational topics, so that little repetition is required the next year.

- **"Missing topics"** When a topic appears to be "missing," you can be assured that it is found in either an earlier or later grade level. For example, you will find place-value concepts in Grade 5, but not repeated in Course 1.
- **More advanced:** As a result of not repeating topics year after year, students who use ***Math in Focus***® will advance faster than students in other programs. As a result, you may find topics that appear to be "too advanced." However, you will find that your students are able to easily handle the challenge as long as they have had the appropriate preliminary instruction.

Preparation for Algebra

Math in Focus® answers the call to prepare students for Algebra. The ***Math in Focus***® sequence of topics emphasizes:

- **Number sense:** In Course 1, integers and integer comparisons are introduced using the number line. Course 2 introduces rational numbers and focuses on computations with rational numbers.
- **Fractions, ratios, and proportional reasoning:** In-depth work with fractions in Grade 5 provides a solid foundation for mastery of ratios, rates, and proportions in Courses 1 and 2.
- **Problem solving:** Challenging problem solving is built into each chapter in every grade level. Multiple representations such as bar models, number lines, manipulatives or concrete models, tables, and graphs lead students to the use of variables in algebraic expressions, equations, and inequalities.

Developmental Continuum for Algebra

Grade 5	Course 1	Course 2	Course 3
Concepts and skills development through hands-on instruction and practice			
• multiplication and division algorithms for whole numbers • using model drawings to solve problems involving whole numbers and fractions • mental math			
Emphasis on problem solving, skill consolidation and deep understanding in preparation for algebra			
	• exponents and order of operation • multiplying and dividing fraction and decimals • understanding and using ratios, rates, and percents • using model drawings to solve problems involving ratios, rates, and percents	• operations with rational numbers • order of operations	
Introductory algebraic concepts in preparation for a first course in algebra			
	• variable in algebraic expressions • relating model drawing to algebraic expressions • using geometric formulas for area to write linear equations	• solving multi-step equations involving fractions and decimals • solving inequalities • solving and graphing proportional relationships • using area and volume formulas to write equations	• using the laws of exponents, including zero and negative exponents • writing and sketching lines in slope-intercept form • solving problems involving functions, systems of linear equations, and Pythagorean Theorem

	Grade 5	Course 1	Accelerated
Number and Operations			
Sets and Numbers		Understand that positive and negative numbers can be used to describe quantities having opposite directions or values. [Chapter 2] Use positive and negative numbers to represent quantities in real-world contexts. Understand rational numbers as points on the number line. [Chapter 2] Extend number lines to represent points with negative coordinates; locate negative integers on a horizontal or vertical number line. [Chapters 2 and 9] Use negative numbers to identify and locate points in all four quadrants of the coordinate plane. [Chapter 9] Understand that the absolute value of a number is its distance from 0 on the number line. [Chapter 2] Interpret the absolute value of a rational number as magnitude for a positive or negative quantity in a given context. [Chapter 2]	Know that the set of positive and negative fractions, along with 0, make up the rational number system. [Chapter 1] Understand that the decimal representation of a rational number is either terminating or repeating. [Chapter 1] Know that numbers that are not rational are called irrational. [Chapter 1] Understand that some numbers, such as π or $\sqrt{2}$, are irrational. [Chapter 1] Know that the set of real numbers is composed of the two distinct sets: rational numbers and irrational numbers. [Chapter 1]
Number Representation	Express numbers to 10,000,000 in various forms. [Chapter 1] Use line exponents to denote powers of 10. [Chapter 1]	Represent fractions, decimals and integers on a number line. [Chapter 2] Relate the square of a whole number to the area of a square, and the cube of a number to the volume of a cube. [Chapter 1] Find the square or cube of a number. [Chapter 1] Find the square root or cube root of a perfect square or perfect cube, up to 150. [Chapter 1]	Write rational numbers as terminating or repeating decimals. [Chapter 1] Write the prime factorization of a number using exponential notation. [Chapter 7] Represent numbers in scientific notation. [Chapter 8] Interpret numbers in scientific notation that have been generated by technology. [Chapter 8] Represent irrational numbers on the number line using their decimal approximations. [Chapter 1]

	Grade 5	Course 1	Accelerated
Number and Operations (continued)			
Number Representation (continued)			Approximate numbers to a given number of significant digits. [Chapter 1]
Count	Count by hundred thousands and millions. [Chapter 1]		
Compare and Order	Compare and order whole numbers to 10,000,000. [Chapter 1]	Write, interpret, and explain statements of order for fractions and integers. [Chapter 2] Interpret statements of inequality as statements about the relative position of two numbers on a number line. [Chapter 8] Distinguish comparisons of absolute value from statements about order. [Chapter 2]	Compare two rational numbers using their decimal expansions. [Chapter 1] Compare irrational numbers using their rational approximations. [Chapter 1] Compare the relative sizes of two measurements expressed in exponential notation or in scientific notation. [Chapters 7 and 8]
Place Value	Understand place-value concepts through millions. [Chapter 1]		Write numbers in scientific notation. [Chapter 8] Round a number to a given number of significant digits. [Chapter 1]
Fraction Concepts	Understand how to convert fractions to decimals. [Chapter 4] Understand the relationships between fractions and division expressions. [Chapter 2]		Write rational numbers in $\frac{m}{n}$ form, where m and n are integers. [Chapter 1]
Decimal Concepts	Model decimals using thousandths. [Chapter 4] Understand place value concepts through thousandths. [Chapter 4] Understand how to convert decimals to fractions. [Chapter 4]		Write rational numbers as decimals. [Chapter 1] Understand that the decimal representation of a rational number is either terminating or repeating. [Chapter 1] Approximate the decimal form of an irrational number using rounding. [Chapter 1]

	Grade 5	Course 1	Accelerated
Number and Operations (continued)			
Whole Number Computation: Multiplication and Division Algorithms	Multiply multi-digit numbers. [Chapter 1] Find quotients involving multi-digit dividends. [Chapter 1]		Identify the number of significant digits in a whole number, decimal number, or measurement. [Chapter 1] Compute with very large and very small numbers written in scientific notation. [Chapter 8] Solve real-world problems that involve calculations using scientific notation. [Chapter 8]
Whole Number Computation: Multiplication and Division Real-World Problems	Compare the size of a product to one factor without multiplication. [Chapter 1] Solve multiplication and division problems. [Chapter 1] Determine the most useful form of the quotient and interpret the remainder. [Chapter 1]		
Fraction Computation	Add and subtract unlike fraction and mixed numbers. [Chapter 2] Multiply proper fractions, improper fractions, mixed numbers, and whole numbers. [Chapter 3] Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. [Chapter 3] Divide fractions by whole numbers. [Chapter 3] Divide a whole number by a unit fraction. [Chapter 3] Solve word problems with addition, subtraction, multiplication, and division of fractions. [Chapter 3]	Interpret and compute quotients of fractions. [Chapter 3] Represent situations involving multiplication and division of fractions using models, such as bar models and area models. [Chapter 3] Solve real-world problems involving division of fractions by fractions. [Chapter 3]	Extend multiplication of fractions to include multiplication of rational numbers. [Chapter 1] Interpret the sum, product, or quotient of two rational numbers in a real-world context. [Chapter 1]

	Grade 5	Course 1	Accelerated
Number and Operations (continued)			
Decimal Computation	Add and subtract decimals. [Chapter 5] Multiply and divide decimals by whole numbers. [Chapter 5] Solve problems with multiplication and division of decimals. [Chapter 5]	Fluently multiply and divide multi-digit decimals using standard algorithms. [Chapter 3] Represent situations involving multiplication and division of decimals using models, such as bar models and area models. [Chapter 3] Solve problems by multiplying and dividing decimals, interpreting remainders to suit the context of the problem. [Chapter 3]	Solve real-world problems involving all four operations with rational numbers. [Chapter 1] Compute with very large and very small numbers written in scientific notation. [Chapter 8] Solve real-world problems that involve calculations using scientific notation. [Chapter 8]
Estimation and Mental Math	Use estimation and mental math to estimate sums, differences, products, and quotients. [Chapter 5] Round decimals. [Chapter 4] Estimate sums and differences with fractions and decimals. [Chapters 2 and 5] Estimate products and quotients with decimals. [Chapter 5]	Estimate answers to percent problems to check for reasonableness. [Chapter 6]	Solve real-world and mathematical problems and assess reasonableness of answers using estimation and mental math strategies. [Chapter 1]
Computations with Rational Numbers: Addition and Subtraction			Describe situations in which opposite quantities combine to make 0. [Chapter 1] Understand the sum $p + q$ as the number located at a distance $\|q\|$ from p. [Chapter 1] Understand subtraction of a rational number as adding its inverse. [Chapter 1] Find the distance between two numbers on a number line using absolute value. [Chapter 1] Solve real-world problems involving addition and subtraction with rational numbers. [Chapter 1] Interpret the sum of two rational numbers in a real-world context. [Chapter 1]

	Grade 5	Course 1	Accelerated
Number and Operations (continued)			
Computations with Rational Numbers: Multiplication and Division			Apply properties of operations to multiply and divide rational numbers. [Chapter 1] Understand that the quotient of any two integers a and b is the rational number $\frac{a}{b}$ $(b \neq 0)$. [Chapter 1] Understand that $-\left(\frac{p}{q}\right) = \frac{(-p)}{q} = \frac{p}{(-q)}$. [Chapter 1] Solve real-world problems involving multiplication and division of rational numbers. [Chapter 1] Interpret the product or quotient of two rational numbers in a real-world context. [Chapter 1]
Algebra / Expressions and Equations			
Patterns	Identify, describe, and extend numeric patterns involving all operations. [Chapter 7] Find rules to complete number patterns. [Chapter 7] Form and graph ordered pairs of corresponding terms from two numerical patterns. [Chapter 7]		Use a number pattern to explore multiplication of negative numbers. [Chapter 1] Use number patterns as a context for generating equations in two variables. [Chapter 5]
Properties	Explain patterns in the number of zeroes and in the placement of the decimal point when multiplying a number by a power of 10. [Chapter 5]	Use the distributive property to factor the sum of two whole numbers, or algebraic terms with whole-number coefficients. [Chapter 7]	Use the properties of real numbers to add and subtract rational numbers. [Chapter 1] Use the properties of real numbers to extend multiplication and division of fractions to multiplication and division of rational numbers. [Chapter 1] Use the distributive property to show that $(-1)(-1) = 1$. [Chapter 1] Apply properties of real numbers to add, subtract, factor and expand algebraic expressions with rational coefficients. [Chapter 2]

	Grade 5	Course 1	Accelerated
Algebra / Expressions and Equations (continued)			
Properties (continued)			Apply properties of real numbers to manipulate variables when solving linear equations in two variables. [Chapter 4]
Number Theory	Apply the least common multiple concept to finding a common denominator for two fractions. [Chapter 2]	Write a composite number as a product of its prime factors. [Chapter 1] Find the greatest common factor or least common multiple of two whole numbers. [Chapter 1]	Write the prime factorization of a number using divisibility rules and exponential notation. [Chapter 7]
Functional Relationships	Understand the relationships between the numbers and symbols in formulas for volume. [Chapter 6] Describe number relationships in context. Graph ordered pairs and equations from tables of values. [Chapter 7]	Use variables to write equations representing two real-world quantities that change in relation to one another. [Chapters 7 and 8] Analyze the relationship between an independent and dependent variable using graphs, tables, and equations. [Chapter 9]	Understand that a function is a rule that assigns to each input exactly one output. [Chapter 6] Represent functions algebraically, in tables, and in graphs. [Chapter 6] Know that the graph of a function is the set of ordered pairs consisting on an input and its corresponding output. [Chapter 6] Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [Chapter 6] Interpret the equation $y = mx + b$ as defining a linear function. [Chapter 6] Determine and interpret the rate of change and initial value of a function from the context or data. [Chapter 6] Give examples of functions that are not linear. [Chapter 6] Construct a function to model a linear relationship between two quantities. [Chapter 6] Create function tables using a spreadsheet. [Chapter 6]

	Grade 5	Course 1	Accelerated
Algebra / Expressions and Equations (continued)			
Functional Relationships (continued)			Represent a direct proportion as a function table, an equation, and a graph. [Chapter 6] Represent an inverse proportion using a function table (with an appropriate range), an equation, and a graph. [Chapter 6]
Expressions/ Models	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. [Chapter 1] Write and simplify numerical expressions. [Chapter 1] Evaluate numeric expressions with two or more operations using the order of operations. [Chapter 1]	Write and evaluate numerical expressions and geometric formulas involving whole-number exponents. [Chapters 10 and 11] Write and evaluate algebraic expressions using the order of operations. [Chapter 7] Identify parts of an expression using terms such as sum, term, product, and coefficient. [Chapter 7] Use the properties of addition and multiplication to write equivalent expressions, including factoring a common factor from a sum. [Chapter 7] Identify equivalent expressions and like and unlike terms of an expression. [Chapter 7] Solve problems using variable expressions in real-world contexts. [Chapters 7 and 8]	Apply properties of real numbers to add, subtract, factor and expand algebraic expressions with rational coefficients. [Chapter 2] Represent an expression in equivalent forms to help solve a problem. [Chapter 2] Represent an expression using a bar model. [Chapter 2] Write equivalent expressions by knowing and applying the following properties of integer exponents: [Chapter 2] • the product and quotient of powers, • the power of powers, • the powers of products and quotients, and • zero and negative exponents Write two numbers in scientific notation to compare their relative sizes. [Chapter 7]
Number Sentences and Equations	Write and solve number sentences and equations for multi-step word problems. [Chapter 1] Write and solve equations. [Chapters 1, 2, 3, 5, 6, 9, and 10] Graph linear equations. [Chapter 7]	Use substitution to identify value(s) that make an equation or inequality true. [Chapter 8]	Identify equivalent equations. [Chapter 3]
Equality and Inequality	Understand equality and inequality. [Chapter 1] Write and interpret statements of equality and inequality. [Chapter 1]	Write and solve addition and multiplication equations to solve real-world problems. [Chapters 3, 4, 5, 6, 7, and 8]	Write equivalent equations using properties of equality. [Chapter 3] Solve two-step equations of the form $ax + b = c$ and $a(x + b) = c$. [Chapter 3]

	Grade 5	Course 1	Accelerated
Algebra / Expressions and Equations (continued)			
Equality and Inequality (continued)	Understand equality and inequality. [Chapter 1] Write and interpret statements of equality and inequality. [Chapter 1]	Write and evaluate an inequality of the form $x < c$ or $x > c$ to represent a real-world situation. [Chapter 8] Recognize that an inequality of the form $x < c$ or $x > c$ has an infinite number of solutions and represent the solutions on a number line. [Chapter 8]	Solve inequalities using addition, subtraction, multiplication, or division. [Chapter 3] Solve word problems that lead to inequalities of the form $ax + b > c$ or $ax + b < c$. [Chapter 3] Graph the solution set of an inequality in one variable on a number line and interpret it in the context of a real-world problem. [Chapter 3] Use square root and cube root radicals to represent solutions to equations. [Chapter 7] Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. [Chapter 4] Solve linear equations with rational coefficients, including equations that require expanding and collecting like terms. [Chapter 4] Identify the slope, x-intercept, and y-intercept of a linear equation. [Chapter 5] Sketch the graph of a linear equation and write a linear equation from a graph or set of data. [Chapter 5] Solve systems of two linear equations in two variables algebraically. [Chapter 4] Estimate the solution of a system of two linear equations in two variables graphically. [Chapter 5] Solve real-world problems leading to two linear equations in two variables. [Chapter 5]

	Grade 5	Course 1	Accelerated
Algebra / Expressions and Equations (continued)			
The Coordinate Plane	Identify and plot points in the first quadrant of the coordinate plane. [Chapter 7] Make a table of values from an equation, and plot the points these ordered pairs form in the coordinate plane. [Chapter 7]	Use negative numbers to identify and locate points in all four quadrants of the coordinate plane. [Chapter 9] Find the length of horizontal and vertical segments in the coordinate plane. [Chapter 9] Use tables and graphs to represent linear equations. [Chapter 8] Solve real-world problems by graphing points in all four quadrants of the coordinate plane. [Chapter 9] Plot pairs of equivalent rates represented in the coordinate plane. [Chapter 9] Draw polygons in the coordinate plane given the coordinates of the vertices. [Chapter 9]	Explain what the points (x, y), $(0, 0)$, and $(0, c)$ mean in a given proportional context. [Chapter 9] Find the constant of proportionality for quantities that vary directly or inversely from their graphs. [Chapter 9] Graph proportional relationships, interpreting the unit rate as the slope of the graph. [Chapter 5] Define the slope of a line as the ratio of the vertical change to the horizontal change of the line. [Chapter 5] Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. [Chapter 14] Know that the graph of a function is the set of ordered pairs consisting of an input and its corresponding output. [Chapter 6] Know that the graph of a linear function, given by an equation of the form $y = mx + b$, is a straight line. [Chapter 6] Interpret the graph of a nonlinear function as a curve. [Chapter 6] Sketch the graph of a relationship whose verbal description has given qualities. [Chapter 6] Find the image of a figure in the coordinate plane under a translation, rotation, reflection, or dilation. [Chapter 13]

	Grade 5	Course 1	Accelerated
Geometry			
Lines and Angles		Find the lengths of horizontal and vertical segments on a coordinate plane. [Chapter 9]	Identify supplementary and complementary angles. [Chapter 10] Use supplementary, complementary, vertical and adjacent angles to write and solve simple equations for unknown angle measures. [Chapter 10] Identify parallel lines and their transversals. [Chapter 10] Identify and use corresponding angles, alternate exterior angles, and alternate interior angles formed from parallel lines and a transversal to solve problems. [Chapter 10] Use properties of interior angles and exterior angles of a triangle and the related sums. [Chapter 10] Find the images of lines, angles, and parallel lines under rotations, reflections, and translations. [Chapter 13]
Two-Dimensional Shapes / Polygons	Apply the properties of right, isosceles, and equilateral triangles. [Chapter 8] Apply the properties of a parallelogram, rhombus, and trapezoid. [Chapter 8]	Identify regular polygons. [Chapter 9] Draw polygons in the coordinate plane given the coordinates of the vertices. [Chapter 9] Use coordinates to find the length of horizontal or vertical sides of polygons. [Chapter 9]	Solve problems involving drawings of geometric figures. [Chapter 11] Construct a unique triangle given the lengths of its three sides, or the lengths of two sides and the measure of one angle, or the measures of two angles and the length of the included side. [Chapter 11] Know that no triangle is possible if, given the lengths of the three sides, the sum of any two of them is less than or equal to the length of the third side. [Chapter 11]
Three-Dimensional Shapes / Solid Figures	Create a solid figure by using unit cubes. [Chapter 6]		Find cross sections and volumes of right rectangular prisms and right pyramids. [Chapter 12]

	Grade 5	Course 1	Accelerated
Geometry (continued)			
Congruence and Symmetry			Understand that two figures are congruent if one can be moved onto the other by a series of translations, reflections, and rotations. [Chapter 14] Understand that two figures are similar if one can be moved onto the other by a series of translations, reflections, rotations, and dilations. [Chapter 13] Given two congruent or similar figures in a plane, find a sequence of transformations that moves one onto the other. [Chapter 13] Establish the constant of proportionality in similar figures. [Chapter 14] Establish through informal arguments the AA similarity theorem for triangles. [Chapter 14]
Transformations			Verify experimentally that rotations, reflections, and translations preserve lengths, angle measures, parallelism and perpendicularity. [Chapter 13] Find the image of a figure in the coordinate plane under a translation, rotation, reflection, or dilation. [Chapter 13] Understand that two figures are congruent if one can be moved onto the other by a series of translations, reflections, and rotations. [Chapter 13] Understand that two figures are similar if one can be moved onto the other by a series of translations, reflections, rotations, and dilations. [Chapter 13] Given two congruent or similar figures in a plane, find a sequence of transformations that moves one onto the other. [Chapter 13]

	Grade 5	Course 1	Accelerated
Geometry (continued)			
Coordinate Geomety	Plot points on a coordinate grid (first quadrant only). [Chapter 7]		
Circles			Identify the center, radius, diameter, and circumference of a circle. [Chapter 12] Explore the relationship between the diameter of a circle and its circumference. [Chapter 12] Solve real-world problems involving rates and circles. [Chapter 12]
Measurement			
Length and Distance	Use measurement conversions of length in solving real-world problems. [Chapters 1, 2, 3, 5, 6, 9, and 10]		
Weight/Mass	Use measurement conversions of weight/mass in solving real-world problems. [Chapters 1, 2, 3, 5, 6, 9, and 10]		
Capacity/ Volume	Use measurement conversions of capacity/volume in solving real-world problems. Estimate and measure volume in cubic units. [Chapter 6] Recognize volume as additive and find the volumes of prisms and solid figures. [Chapter 6] Use formulas to find the volume of rectangular prisms and other solid figures. [Chapter 6]		
Perimeter / Perimeter and Circumference			Understand how the formula for the circumference of a circle is derived. [Chapter 12] Use a formula to calculate the circumference of circles, semi-circles, and quarter circles. [Chapter 12] Solve problems involving the circumference of circles. [Chapter 12]

	Grade 5	Course 1	Accelerated
Measurement (continued)			
Area		Find the area of triangles, parallelograms, trapezoids, and regular polygons by decomposing into rectangles or triangles. [Chapter 10] Find a missing dimension of a plane figure given its area and other dimension(s). [Chapter 10] Solve real-world problems involving the areas of triangles, parallelograms, trapezoids, and regular polygons. [Chapter 10]	Solve problems involving the areas of triangles, quadrilaterals, and other polygons. [Chapter 12] Compute lengths and areas for a real figure from its scale drawing. [Chapter 12] Understand how the formula for the area of a circle is derived. [Chapter 12] Use a formula to calculate areas of circles, semicircles, and quadrants. [Chapter 12]
Surface Area and Volume	Estimate and measure volume in cubic units. [Chapter 6]	Represent prisms and pyramids with triangular or rectangular faces using nets. [Chapter 10] Use nets of prisms and pyramids to find the surface areas. [Chapter 10] Find the volume of a rectangular prism with fractional edge lengths, and relate this to the formula $V = \ell wh$. [Chapter 10] Find the volume of nonrectangular prisms using the formulas $V = Bh$. [Chapter 10] Solve real-world problems involving surface area and volume of prisms. [Chapter 11]	Find the volume of a pyramid, by relating it to a prism with the same base and height. [Chapter 12] Solve problems involving the surface area and volume of figures composed of cubes and right prisms. [Chapter 12] Apply the Pythagorean theorem to finding the slant height of pyramids and cones and finding their surface areas. [Chapter 12]
Ratios and Proportional Relationships			
Ratios	Understand concept of ratio. [Chapter 9] Use ratios to solve problems. [Chapter 9] Find equivalent ratios. [Chapter 9] Solve two-step real-world problems involving ratios. [Chapter 9]	Understand the concept of ratio and use ratio language to describe proportional relationships. [Chapter 4] Find the missing term in a pair of equivalent ratios or in a rate table. [Chapter 4] Plot pairs of equivalent rates in the coordinate plane. [Chapter 4] Use tables to compare ratios. [Chapter 4]	Define the slope of a line as the ratio of the vertical change to the horizontal change of the line. [Chapter 5] Compute unit rates where the terms are given in fractional units. [Chapter 9] Explore the relationship between two quantities that vary directly or inversely. [Chapter 9]

	Grade 5	Course 1	Accelerated
Ratios and Proportional Relationships (continued)			
Ratios (continued)		Solve multi-step real-world problems involving ratios using bar models. [Chapter 4]	Solve problems involving scale drawings. [Chapter 11] Use proportional reasoning to solve multi-step ratio and percent problems. [Chapter 9]
Representing Ratios		Use multiplication or division to write equivalent ratios. [Chapter 4] Make tables of equivalent ratios, including whole number measurements. [Chapter 4] Use bar models to solve problems involving ratios of three quantities. [Chapter 4]	Represent quantities that vary directly or indirectly using equations or graphs from verbal descriptions. [Chapter 9] Find the constant of proportionality for quantities that vary directly or inversely from tables, graphs, verbal descriptions, or diagrams, such as scale drawings. [Chapters 9 and 11] Explain what the points (x, y), $(0, 0)$, and $(1, c)$ mean in the graph of a given proportional context. [Chapter 9] Graph proportional relationships, interpreting the unit rate as the slope of the graph. [Chapter 5] Compare two different proportional relationships represented in different ways. [Chapter 5] Establish the constant of proportionality in similar figures. [Chapter 14] Use scales and scale factors to solve problems related to scale drawings and scale models. [Chapter 14]
Rates		Understand the concept of a unit rate $\frac{a}{b}$ associated with a ratio $a : b$ $(b \neq 0)$, and use rate language in proportional situations. [Chapter 5] Compute and compare unit rates using the division algorithm. [Chapter 5] Solve unit rate problems, including unit pricing and constant speed. [Chapter 5]	Relate unit rate to slope. [Chapter 5] Recognize that a constant of proportionality can be a unit rate. [Chapter 9]

	Grade 5	Course 1	Accelerated
Ratios and Proportional Relationships (continued)			
Percents	Relate percent to parts of a whole where the whole is made up of 100 equal parts. [Chapter 10] Relate and compare percents, decimals, and fractions. [Chapter 10] Express fractions as percent and vice versa. [Chapter 10] Express decimals as percent and vice versa. [Chapter 10] Find the percentage of a quantity, given the amount and the percentage. [Chapter 10] Solve real-world problems involving percent. [Chapter 10]	Solve percent problems involving simple interest, tax, markups, discounts, and commissions. [Chapter 6] Convert fractions to percents. [Chapter 6] Find a percent of a number. [Chapter 6]	Solve multi-step percent problems involving percent increase and decrease. [Chapter 9] Solve problems involving percent, including finding the whole when the percent and its quantity are known. [Chapter 9] Solve problems involving simple interest, sales tax, markups, and markdowns. [Chapter 9]
Data Analysis / Statistics and Probability			
Classifying and Sorting	Generate a double graph to represent and compare data. [Chapter 7]	Represent data in frequency tables, dot plots and histograms. [Chapter 12] Display a data set in a box plot. [Chapter 13]	
Represent Data	Make a line plot to display a data set of measurements in fractions of a unit. [Chapter 7]		
Interpret/ Analyze Data	Interpret tally charts, bar graphs, picture graphs, tables, line graphs, and line plots. [Chapter 7] Interpret a line plot to solve problems involving addition, subtraction, multiplication, and division of fractions. [Chapter 7]	Recognize a statistical question. [Chapter 12] Understand that a data set has a distribution, which can be described by its center and shape. [Chapter 13] Recognize that a measure of center summarizes all values of a data set with a single number. [Chapter 13] Identify measures of center of a data set and calculate each, and know when each is most useful. [Chapter 13]	Understand that a sample can be used to gather information about a population. [Chapter 15] Understand that a sample can be generalized to a population only if it is representative of the population. [Chapter 15] Know that a random sample usually produces a representative sample. [Chapter 15] Use data from a random sample to make a prediction about the population. [Chapter 15]

	Grade 5	Course 1	Accelerated
Data Analysis / Statistics and Probability (continued)			
Interpret/ Analyze Data (continued)		Describe the overall shape of a distribution, and relate the choice of a center to the shape of the distribution. [Chapter 13] Solve real-world problems involving the mean or median, such as finding a missing data value given the mean. [Chapter 13] Compute measures of variability for a data set: quartiles, interquartile range and mean absolute deviation. [Chapter 13]	Use several samples of the same size to judge the variation in the predictions obtained. [Chapter 15] Relate the variability of a sample to the shape of the data set, and to the context in which the data were collected. [Chapter 15] Use measures of center and variability to compare two populations. [Chapter 15]
Outcomes			Use a Venn diagram to illustrate sample spaces and events. [Chapter 15] Identify the outcomes of a sample space that make up an event, when the event is stated in everyday language. [Chapter 15] Represent the outcomes of compound events using organized lists or tree diagrams. [Chapter 16]
Expressing Probability			Know that the probability of an event is a number between 0 and 1 inclusive. [Chapter 15] Find the probability of complementary and mutually exclusive events. [Chapter 15] Approximate the probability of a chance event using an appropriate sampling technique. [Chapter 15] Compute the approximate relative frequency of a chance event from its probability. [Chapter 15] Develop a sampling technique (probability model) for equally likely events. [Chapter 15]

	Grade 5	Course 1	Accelerated
Data Analysis / Statistics and Probability (continued)			
Expressing Probability (continued)			Develop a sampling technique (probability model) for events that are not equally likely. [Chapter 15] Compare the theoretical and experimental probabilities of an event. [Chapters 15 and 16] Design and use a simulation to generate frequencies for a chance process. [Chapters 15 and 16] Use tree diagrams and multiplication to find the probabilities of dependent and independent events. [Chapter 16] Represent nonmutually exclusive events using Venn diagrams. [Chapter 15]
Making Sense in Solving Problems			
Build Skills Through Problem Solving	Build skills in multiplication, division, fraction concepts, decimals, geometry, data analysis, and measurement through problem solving.	Build skills in multiplication and division of fractions and decimals, ratios, and percents; algebra, data analysis, and geometry and measurement through problem solving.	Build skills in operations with integers and rational numbers; proportionality, measurement, statistics, and probability through problem solving.
Solve Real-World Problems	Solve real-world problems involving multiplication, division, concepts with whole numbers, fractions, and decimals, data analysis, and measurement.	Solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry, and measurement.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.
Reasoning			
Use Appropriate Strategies and Thinking Skills to Solve Problems	Use appropriate strategies to solve real-world problems.	Discuss mathematical ideas, use appropriate strategies, solve real-world problems, and explain solution methods in class.	Discuss mathematical ideas, use appropriate strategies, solve real-world problems, and explain solution methods in class.
Apply and Explain Problem Solving	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.	Apply and explain problem-solving process in Put on Your Thinking Cap! and other activities.

	Grade 5	Course 1	Accelerated
Reasoning (continued)			
Explore Concepts	Explore concepts more deeply and justify reasoning in Let's Explore and Hands-on Activities. Apply Thinking Skills Put On Your Thinking Cap!, Challenging! Practice, and problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Put On Your Thinking Cap!, and other problem-solving activities.	Explore concepts more deeply and justify reasoning in Let's Explore, Put On Your Thinking Cap!, and other problem-solving activities.
Investigate Mathematical Ideas	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.	Further investigate mathematical ideas by completing critical thinking skills activities.
Identify, Demonstrate, and Express Regularity in Reasoning	Examine the relationships between three-dimensional figures and the faces of the two-dimensional figures that form them. Use properties of triangles and four-sided figures to solve problems. Explain the relationships among area formulas of different polygons. Make and analyze a line plot to represent a data set of measurements in fractions of a unit. Identify, describe, and extend numeric patterns involving all operations.	Continue to use bar models to solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry and measurement. Apply the properties of operations to generate equivalent numerical and algebraic expressions. Apply standard algorithms for addition, subtraction, multiplication, and division of whole numbers and decimals. Apply standard algorithms for multiplication and division with fractions. Apply concept of prime factorization to finding square roots and cube roots of perfect squares and perfect cubes. Develop and apply formulas for finding the area of triangles, parallelograms, trapezoids, and regular polygons. Develop and apply other formulas such as the distance formula.	Continue to use number lines, coordinate grids, and other visual models to solve real-world problems involving rational and irrational numbers, functions, proportionality, algebra, geometry, measurement, probability, and statistics. Compute with very large and very small numbers written in scientific notation. Know and apply the properties of integer exponents to write equivalent expressions. Apply the properties of operations to generate equivalent numerical and algebraic expressions. Apply properties of real numbers to manipulate variables when solving linear equations in two variables. Extend algorithms for decimals to include rational numbers. Extend algorithms for fraction operations to operations with positive and negative rational fractions. Apply properties of operations and factorization to factor algebraic expressions with rational coefficients. Define the slope of a line as the ratio of the vertical change to the horizontal change of the line.

	Grade 5	Course 1	Accelerated
Reasoning (continued)			
Identify, Demonstrate, and Express Regularity in Reasoning (continued)			Interpret the equation $y = mx + b$ as defining a linear function. Interpret the graph of a nonlinear function as a curve. Establish the constant of proportionality in similar figures. Develop and apply formula for the volume of pyramids. Understand that if two figures are related by a scale factor of k, then their areas are related by a scale factor of k^2. Develop a probability model and use it to find probabilities of events.
Use a Variety of Reasoning Skills	Use properties to classify triangles and quadrilaterals. Apply understanding of models for multiplication and division of fractions and decimals by whole numbers. Use number properties (including the distributive property) to check reasonableness of results.	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. Apply the properties of operations to generate equivalent numerical and algebraic expressions.	Use activities to describe what a chance process is and explain the discrepancy between relative frequency and probability. Apply the properties of operations to add, subtract, multiply, and divide rational numbers in numerical and algebraic operations. Interpret scientific notation that has been generated by technology. Describe qualitatively the functional relationship between two quantities by analyzing a graph. Verify experimentally the properties of rotations, reflections, and translations. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.

	Grade 5	Course 1	Accelerated
Communication			
Consolidate Mathematical Thinking	Present mathematical thinking through Math Journal activities.	Present mathematical thinking through Math Journal activities, Math Talk, and class discussions.	Present mathematical thinking through Math Journal activities, Math Talk, and class discussions.
Communicate with Peers, Teachers, and Others	Discuss mathematical ideas in Let's Explore activities. Work together in pairs or groups in Let's Explore, Games, and other activities.	Discuss mathematical ideas with others during Let's Explore activities. Work in pairs or groups in Let's Explore, Project Work, and other activities.	Discuss mathematical ideas with others during Let's Explore activities. Work in pairs or groups in Let's Explore, Project Work, and other activities.
Share Mathematical Thinking	Share mathematical ideas with others during Let's Explore and Hands-on Activities.	Share mathematical ideas with others during Let's Explore and other activities.	Share mathematical ideas with others during Let's Explore and other activities.
Construct Arguments and Express Mathematics Ideas	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.	Express ideas in Math Journal activities, using section vocabulary. Use chapter and section vocabulary correctly.
Connections and Structure			
Look for and Use Structure to Recognize Connections in Mathematical Ideas	Understand the relationship between fractions and division. Understand the relationship among fractions, and decimals, as ways to represent parts of a whole. Examine the relationships between three-dimensional figures and the two-dimensional figures that form them. Understand the relationship between fractions and division.	Relate ratios, fractions, and rates. Understand that ratios can represent part-to-part as well as part-to-whole relationships. Convert among fractions, decimals, and percents.	Show that a number and its opposite have a sum of 0. Examine the relationships among integers and rational numbers. Extend understanding of operations with fractions to operations with positive and negative rational numbers. Extend understanding of operations with numerical terms to operations with algebraic terms. Convert among various forms of rational numbers depending on the real-world or mathematical situation. Describe the two-dimensional figures that result from slicing three-dimensional figures. Relate unit rate to slope. Apply properties of real numbers to manipulate variables when solving linear equations in two variables.

	Grade 5	Course 1	Accelerated
Connections and Structure (continued)			
Look for and Use Structure to Recognize Connections in Mathematical Ideas (continued)			Use number patterns as a context for generating equations in two variables. Construct a function to model a linear relationship between two quantities. Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. Use experiments to describe the effects of transformations on congruent and similar figures. Interpret the relationship between two data sets shown in a scatter plot. In two-way tables, identify and analyze patterns of association displayed in the frequencies and relative frequencies.
Understand How Concepts Build on One Another	Explain the relationships among area formulas of different polygons. Identify equivalent fractions, mixed numbers, and decimals. Make connections among operations with fractions and decimals.	Make connections between ratios, fractions, and rates. Make connections between squares and square roots, cubes and cube roots.	Make connections between operations with integers and rational numbers. Make connections between operations with numerical and algebraic terms. Examine the relationships between the nets of prisms and their surface areas. Examine the relationships between cross-sections of prisms and their volume.
Solve Real-World Problems in Contexts Outside of Mathematics	Solve real-world problems involving multiplication, division, fraction, decimal, ratio, and percent concepts, data analysis, and measurement. Solve real-world problems involving all four operations with whole numbers, fractions, and decimals, algebra, geometry, measurement, and data analysis.	Solve real-world problems involving multiplication, division, concepts with fractions, decimals, ratios, and percents; data analysis, geometry, and measurement.	Solve real-world problems involving operations with integers and rational numbers; proportionality, measurement, statistics, and probability.

	Grade 5	Course 1	Accelerated
Representation and Model Mathematics			
Use Representations to Attend to Precision	Explore negative numbers in context. Write numbers to 10,000,000 in various forms. Model decimals to thousandths. Use letters as variables to represent unknown values in equations and formulas. Convert fractions and mixed numbers to decimals and decimals to fractions and mixed numbers. Interpret symbols of relation in comparing whole numbers, fractions, and decimals. Use a variety of models for multiplication and division of fractions and decimals by whole numbers. Use the order of operations in numeric expressions with two or more operations and grouping symbols. Write and solve equations. Use a coordinate grid to represent an equation as a graphed line. Understand the relationships between the numbers and symbols in formulas for area and volume. Find rules to complete number patterns.	Translate between fractions, decimals, ratios, and percents. Select the most useful form (fraction or decimal) for solving problems involving percents. Use a variety of models to solve problems involving ratios, rates, and percents. Use visual models (area models, sets, and number line drawings) to represent problems involving fractions, decimals, ratios, rates, and percents. Use part/whole, comparison, and before and after bar models to represent multi-step real-world problems with whole numbers, fractions, decimals, ratios, rates, and percents. Measure distances in the coordinate plane. Use a net to find the surface area of a pyramids and prisms. Represent data in a dot plots and histograms. Display numerical data in plots on a number line, including line plots, dot plots, and histograms.	Translate among the various forms for rational numbers. Select the most useful form of a rational number to solve real-world and mathematical problems. Use activities with various models to understand sampling, chance, and probability. Use various models to solve multi-step real-world problems involving integers, equations, inequalities, proportions, scale drawings, formulas, probability, and statistics. Solve problems involving scale drawings of geometric figures, including measuring actual lengths and areas. Identify the constant of proportionality in scale drawings and other diagrams. Show how to use a random number table to simulate random samples. Display data in line plots, dot plots, box plots, Venn diagrams, and histograms. Use overlapping data distributions to measure the difference between two populations. Find probabilities for compound events using organized lists or tables. Use tree diagrams and multiplication to find the probabilities of dependent and independent events. Represent nonmutually exclusive events using Venn diagrams. Design and use a simulation to generate frequencies for compound events.

	Grade 5	Course 1	Accelerated
Representation and Model Mathematics (continued)			
Use Representations to Attend to Precision (continued)			Know and apply the properties of integer exponents to write equivalent expressions. Use square root and cube root radicals to represent solutions to equations. Write two numbers in scientific notation to compare their relative sizes. Sketch the graph of a linear equation and write a linear equation from a graph or set of data. Use similar triangles to explain why the slope *m* is the same between any two distinct points on a nonvertical line in the coordinate plane. Define and illustrate transformations, using graphs, geometric software and diagrams, the properties of translations, reflections, rotations, and dilations. Describe patterns of clustering, outliers, linear or nonlinear association displayed by a scatter plot.
Select and Apply Appropriate Models and Tools to Represent Problems	Translate among fractions, mixed numbers, and decimals. Find the most useful form of the quotient. Use a variety of models and tools for multiplication and division of fractions and decimals by whole numbers. Use technology (virtual manipulatives and computers) to model and draw.	Use geometry tools (protractor, set squares, grid paper) to model problems. Use technology (virtual manipulatives and computers) to model and draw. Select appropriate formulas and units in solving problems involving perimeter, area, surface area, and volume. Use a calculator to model, compute, and solve.	Use geometry tools (protractor, set squares, grid paper) to model problems. Use technology (virtual manipulatives and computers) to model and draw. Use tools such as rulers, protractors, and technology to draw geometric figures with given conditions. Use geometry tools to construct triangles. Select appropriate formulas and units in solving problems involving perimeter, area, surface area, and volume.

	Grade 5	Course 1	Accelerated
Representation and Model Mathematics (continued)			
Select and Apply Appropriate Models and Tools to Represent Problems (continued)			Use a calculator to model, compute, and solve problems involving rational numbers. Interpret numbers in scientific notation that have been generated by technology. Solve real-world problems that involve calculations with very large and very small numbers using scientific notation. Verify experimentally the properties of rotations, reflections, and translations regarding the images of lines, angles, and parallel lines.
Interpret Phenomena Through Representations	Measure volume of a rectangular prism. Generate a line plot to represent measurement data. Make a table of values from an equation, and plot the points these ordered pairs form in the coordinate plane. Solve real-world problems involving whole number, fraction, and decimal operations, algebra, data analysis, and measurement.	Write the square and cube of a whole number using indices. Represent negative numbers on a number line and in the coordinate plane. Represent solutions of inequalities on a number line. Understand absolute value of a rational number as its distance from 0 on a number line. Find equivalent ratios and rates.	Introduce integers and rational numbers and their definitions. Map rational on the number line. Understand subtraction of rational numbers as adding the additive inverse. Use the laws of equality to write equivalent equations. Write numbers in exponential notation. Interpret numbers in scientific notation that have been generated by technology. Apply properties of real numbers to manipulate variables when solving linear equations in two variables. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. Represent functions algebraically, in tables, and in graphs. Construct a function to model a linear relationship between two quantities.

Notes

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