4th Grade Math in Focus

Chapter 1: Working With Whole Numbers
Key Learning Objectives

Read,Write and Represent Numbers	Compare and Order Numbers	Adding and Subtracting Multi-Digit Numbers
In Sections 1 and 2, students will learn to read and write numbers to 100,000 in standard form, word form, and expanded form, as well as state the place and value of each digit in a 5-digit number. Use of place-value strips as concrete and pictorial tools will help establish visual understanding of the value of each digit.	In Section 3, students will learn to compare 5- and 6-digit numbers. They will apply the concepts of place value learned in Sections 1 and 2, and use concrete manipulatives to identify how much greater or less one number is than another, find rules in number patterns, and create number patterns.	In Section 4, students will learn to add and subtract multi-digit numbers fluently. They will use concrete materials to build the concept of regrouping resulting in the ability to visualize it. Students will learn to record their thinking with a traditional algorithm once they have established understanding.
Rounding and Estimating	**Real-World Problems: Addition and Subtraction**	
In Section 5, students will learn to round numbers to the nearest thousand, estimate sums and differences, and learn to decide whether an estimate or an exact answer is needed. Students will build on place value concepts as they develop mental flexibility, while working with addition and subtraction of larger numbers.	In Section 6, students will learn to use Polya's four-step problem-solving model in tandem with bar models to solve real-world addition and subtraction problems. The visual support of the bar model will help students learn to evaluate the information contained within a given problem, look for relationships between and among numbers, and make sense of what they know.	

Chapter 2: Multiplication and Division
Key Learning Objectives

Multiplying by a 1-Digit or 2-Digit Number	Quotient and Remainder and Dividing by a 1-Digit Number	Real-World Problems: Multiplication and Division
In Section 1, students will learn to multiply a 4-digit number by a 1-digit number, multiply a 2-digit or 3-digit number by a 2-digit number, and estimate products. Use of place-value chips, and then area models, as concrete and pictorial tools will help establish visual recognition of multiplication and lead students to establish real understanding of the processes within the standard algorithm	In Sections 2 and 3, students will learn to find the quotient and remainder in a division problem and divide up to 4-digit numbers by 1-digit numbers. They will explore with concrete manipulatives and pictorial area models to then work in the abstract with understanding.	In Section 4, students will learn to use multiplication and division to solve real-world problems. They will use bar modeling to build the information presented to them in words, resulting in the ability to visualize the problems in order to solve it.
Factors and Multiples	**Real-World Problems: The Four Operations**	
In Sections 5 and 6, students will learn to find factors and multiples of whole numbers, find common factors and common multiples of a pair of numbers, and identify prime and composite numbers.	In Section 7, students will learn to use bar models to solve real-world problems involving the four operations. The visual support of bar models will help students learn to evaluate the information contained in a given problem.	

Chapter 3: Fractions and MIxed Numbers
Key Learning Objectives

Equivalent Fractions	Add and Subtract Like Fractions	Identify and Simplify Mixed Numbers
In Section 1, students will learn to identify and make equivalent fractions. They will use common factors to simplify fractions, and identify a fraction in its simplest form.In Section 2, students compare unlike, yet related, fractions. They will apply the concept of equivalent fractions to compare numerators, compare denominators, and use benchmark fractions.	In Section 3, students will learn to add and subtract fractions with common denominators. They will also learn to subtract from one whole.	In Sections 4, 5, and 6, students will learn about mixed numbers and improper fractions. Students will interpret pictorial representations and show equivalence with fraction circles and on a number line. Students will use factors of the numerator and denominator to simplify the fractional part of a mixed number.
Add and Subtract Mixed Numbers	**Multiply Fractions and Whole Numbers**	**Real-World Problems: Fractions**
In Section 7, students will extend on what they learned in Section 3, to add and subtract with mixed numbers. When subtracting with fractions, students will rename a whole, when required, to have enough parts to subtract.	In Section 8, students will learn to multiply fractions by whole numbers using fraction circles, bar models and number lines to visualize the process. Students learn to write fractions as sums of unit fractions and products of a whole number and a unit fraction.	In Section 9, students will learn to use models to solve multi-step real-world problems involving fractions. Students will use strategies they have learned in Sections 1 to 8 to understand the problem, determine the operation/s required, and solve the problem.

Chapter 4: Decimals
Key Learning Objectives

Understanding Tenths and Hundredths	Comparing and Ordering Decimals
In Sections 1 and 2, students will learn to read and write tenths and hundredths in decimal form, correct to 1 and 2 decimal places, respectively. They will represent and interpret tenths and hundredths using bar models of 10, hundred grids, place-value chips on place-value charts, and number lines. Students should be able to recognize that 10 tenths equal 1 one and that one hundredth is equivalent to 0.01.	In Section 3, students will learn to compare and order decimals and look for a pattern to complete number sequences. They will apply their knowledge and understanding of tenths and hundredths learned in Sections 1 and 2, to compare and order decimals with the use of a number line, hundreds grid, and place-value chart.
Rounding Decimals	**Fractions and Decimals**
In Section 4, students will learn to round decimals to the nearest whole number and demonstrate this using number lines. They then extend to round to the nearest tenth or to 1 decimal place. Students should be able to describe the rules for rounding, and give examples of decimal numbers that round up, and decimal numbers that round down. The use of pictorial representations in the form of number lines will help deepen understanding of rounding, and provide mental pictures to refer to later.	In Section 5, students will learn to express fractions (whose denominator is a factor of 10 or 100) as decimal numbers by changing the denominator to 10 or 100. Students explore two different methods to express unit fractions as decimals: number lines and equivalent fractions. They will learn to express a decimal as a fraction in simplest form. This understanding will lead to the ability to add and subtract decimals.

Chapter 5: Conversion of Measurements
Key Learning Objectives

Length, Weight, and Volume in Customary Units	Length, Mass, and Volume in Metric Units	Time
In Sections 1 to 3, students will learn to read, measure, and estimate customary measures for length, including inches, feet, yards, and miles. They will estimate and measure weight and volume in small and large customary units. They will convert different units of measurement of length, and read scales in customary units. Use of the four-step problem-solving method and bar models is encouraged to solve real-world problems involving customary units of measure.	In Sections 4 to 6, students will read, measure, and estimate metric measures for length, mass, and volume. They will convert between different units of measurement, such as meters to centimeters, kilometers to meters, kilograms to grams, and liters to milliliters. They will continue to develop their problem-solving strategies to solve real-world problems involving metric units of measure.	In Section 7, students will learn to tell time to the second and convert minutes to seconds, using manipulatives to prove their thinking. They will read and tell time using the 24-hour clock. Students will learn the uses of a 24-hour clock, such as timetables for various types of transportation. They will then apply what they learn to solve real-world problems involving elapsed time.

Chapter 6: Area and Perimeter
Key Learning Objectives

Perimeter and Area	Composite Figures	Perimeter
In Section 1, students will explore the relationship between area and perimeter. They will learn to apply the formulas for area and perimeter in problems and extend this to find the length of an unknown side given the perimeter or area.	In Section 2, students will learn to find the perimeter and area of composite figures. They will decompose figures into squares and/or rectangles to find the perimeter and area of composite figures. Students will also find an unknown side length of a composite figure, given its perimeter or area.	In Section 3, students will use the four-step problem-solving model to solve real-world problems involving area and perimeter. These problems require students to visualize the composite figures and then find unknown side lengths, and the perimeters and the areas of the whole or parts of the figures

Chapter 7: Angles and Line Segments
Key Learning Objectives

Understand, Measure, and Draw Angles to 180°	Turns and Angle Measures
In Sections 1 and 2, students will learn to name, measure, and draw angles. In Section 1, they will learn that an angle is formed when two straight lines meet at a point (or vertex) and use two ways to name angles (for example, $\angle ABC$ and $\angle x$). In Section 2 students use a protractor to measure and draw angles to 180°	In Section 3, students will learn to relate turns to angle measures. They will learn that ¼, ½ and ¾ and full turns can be related to the number of right angles (90°) and will discover that an angle measure of 1° represents 1/360 of a full turn. Students will later use this knowledge to give directions and to locate a place in relation to a person or object.
Find Unknown Angles	**Draw Perpendicular and Parallel Line Segments**
In Section 4, students will learn to use addition and subtraction to find unknown angle measures. They will move on to solve problems in real-world contexts. Students will use precise mathematical language in their working, identifying and naming angles to write number sentences to find unknown angles.	In Section 5, students will learn to use a drawing triangle to draw perpendicular and parallel line segments. Students will also draw perpendicular and parallel line segments on a grid. They are introduced to the mathematical symbols, II and I

Chapter 8: Polygons and Symmetry
Key Learning Objectives

Classifying Triangles and Polygons	Symmetric Shapes and Lines of Symmetry	Making Symmetric Shapes and Patterns
In Sections 1 and 2, students will learn to define and classify polygons based on their attributes. They will classify triangles depending on whether their angles are right, acute, or obtuse. They will classify quadrilaterals by their properties. In particular, students will compare the attributes of squares, rectangles, rhombuses, and trapezoids on the basis of whether the figures have sides of equal lengths or are parallel, and the angles are 90°.	In Section 3, students will learn to identify and create symmetric shapes and lines of symmetry, and to correctly draw a line of symmetry. They will use concrete materials like cut-outs to identify symmetric shapes. Students will learn that a line of symmetry can run in any direction, and that some shapes and figures have multiple lines of symmetry.	In Section 4, students will have the opportunity to extend what they have learned about symmetric shapes. They will make symmetric shapes and patterns with squares and triangles on square grids, and explore creating symmetric figures by drawing figures on folded paper, cutting them out, and unfolding.

Chapter 9: Tables and Line Graphs
Key Learning Objectives

Make, Interpret, and Use Tables	Line Graphs
In Sections 1 and 2, students will make, interpret, and use tables. They will learn to find relevant data in tables using the intersections of rows and columns, and to fill in missing information. Students will use concrete materials like real-world schedules and tables to connect conceptual understanding to real-world application. This might include, for example, reading a bus schedule or determining water or electrical usage on a utility bill.	In Section 3, students will learn to read, interpret, and draw line graphs. They will discover that line graphs visually represent a variety of situations, including change over time, cost over quantity, etc. Next, students will move on to using their knowledge of bar graphs, picture graphs, and line graphs to choose an appropriate graph for a given set of data.