

Fourth Grade Math Scope and Sequence 21-22

The following is a recommended sequence in which to teach the standards within the clusters.

Daily Numeracy

A number sense routine is an engaging, accessible, purposeful routine to begin your math class that promotes a community of positive mathematics discussion and thinking. Number Sense standards are **addressed and spiraled throughout the year during daily number sense routines**. The numeracy activities should be rotated and varied in the mode delivered. Number sense routines do not necessarily have to align to the content that is currently being taught during mini lessons.

Cluster 1

In this cluster, students will go beyond knowing what place a digit is in and begin to **understand the relationships between the places** that make up a number, such as 10 groups of 10 make 100 or 10 groups of one-tenth make 1. In addition, students will begin to **develop an understanding of these relationships as multiplication or division**. Students will also be looking at identifying the number in the given place, write it using **expanded notation**, and write it as a numeral. **Rounding** is a skill that students will be exposed to during this cluster. Notice what the Knowledge and Skills statement says—“understand relationships related to place value.” Rather than relying on rules, rounding numbers teaches **students to estimate the value of a number based on place value**. This cluster also begins a students’ **formal introduction to decimals**. Students should already be familiar with them in the context of money. In 4th grade, students are introduced to decimals **using models**. The decimals should include tenths and hundredths **only**.

Process Standards should be taught throughout all components of the workshop.

- 4.1 The student uses mathematical processes to acquire and demonstrate mathematical understanding.
- 4.1(A) Apply mathematics to problems arising in everyday life, society, and the workplace
- 4.1(B) Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution
- 4.1(C) Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
- 4.1(D) Communicate mathematical ideas, reasoning, and their implications using multiple representations
- 4.1(E) Create and use representations to organize, record, and communicate ideas
- 4.1(F) Analyze mathematical relationships to connect and communicate math ideas
- 4.1(G) Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication


Cluster 1: Understanding	Knowledge and Skills	4.2 Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:
	Readiness	4.2(B) represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals



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<p>Relationships between PV, Introduction to Decimals</p> <p>Suggested Pacing: August 12 - October 1</p>	Supporting	4.2(A) interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left
	Supporting	4.2(C) compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols $>$, $<$, or $=$
	Supporting	4.2(D) round whole numbers to a given place value through the hundred thousands place
	Knowledge and Skills	4.4 Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:
	Supporting	4.4(G) round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers
	Knowledge and Skills	4.2 Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:
	Readiness	4.2(G) relate decimals to fractions that name tenths and hundredths
	Supporting	4.2(E) represent decimals, including tenths and hundredths, using concrete and visual models and money
	Supporting	4.2(F) compare and order decimals using concrete and visual models to the hundredths
	Knowledge and Skills	4.4 Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:
	Readiness <i>Essential</i> 	4.4(A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm



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Cluster 2

Cluster 2 includes the **continuation of learning about fractional understanding**. Students will be **decomposing fractions** into unit fractions and sums of unit fractions. (**fraction manipulatives and pictorial models will provide a concrete basis for success**). This cluster will continue students' understanding of fractions with a focus on **addition and subtraction of fractions that have equal denominators**. Students are to **use objects and pictorial models** to understand and perform the operations.

Spiral Essentials

The following essential standard from the previous cluster should be spiraled throughout this cluster during **number sense routines, learning stations, and small group instruction** based on formative assessments. *Process Standards should be taught throughout all components of the workshop (see page 1).*

4.4(A) add and subtract whole numbers and decimals to the hundredths place using the standard algorithm

<p>Cluster 2: Fractional Understanding</p> <p>Suggested Pacing: October 4 - November 12</p> <p>Snapshot Window: November 8 - November 12</p>	Knowledge and Skills	4.3 Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:
	Readiness Essential 	4.3(D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols $>$, $=$, or $<$
	Supporting	4.3(C) determine if two given fractions are equivalent using a variety of methods
	Readiness Essential	4.3(E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations
	Supporting	4.3(A) represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$
	Supporting	4.3(B) decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations
	Supporting	4.2(H) determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line
	Supporting	4.3(G) represent fractions and decimals to the tenths or hundredths as distances from zero on a number line
	Supporting	4.3(F) evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, $1/4$, $1/2$, $3/4$, and 1, referring to the same whole



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Cluster 3

In this cluster, students will use many different **models and strategies to multiply and divide whole numbers**. Students develop their understanding of multiplication by using **arrays, area models, and/or equations**. Students are required to multiply two-digit numbers by two-digit numbers and up to four-digit by one-digit numbers. Strategies used for multiplication are: **mental math, partial products, commutative property, associative property, distributive property**. As students begin to explore division, students will be using three different models: **arrays, area models, equations**. Students are working with only **four-digit by one-digit division**. Students should develop a fluent understanding in solving both **one-step and two-step problems that involve multiplication and division**. The division problems should include interpretation of remainders.



Students will also be utilizing **equations and/or strip diagrams that represent problems and using variables** to stand for unknown quantities. This cluster also addresses students analyzing a problem situation, by creating an **input-output table** in such a way that there is a clear number pattern. Students should NOT focus on the pattern itself, but rather the focus should be on the pattern that connects an input to an output.

Spiral Essentials

The following essential standard from the previous cluster should be spiraled throughout this cluster during **number sense routines, learning stations, and small group instruction** based on formative assessments. *Process Standards should be taught throughout all components of the workshop (see page 1).*

4.3(D) compare two fractions with different numerators and different denominators and represent the comparison using the symbols $>$, $=$, or $<$

4.3(E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations

Cluster 3: Models and Strategies to Multiply and Divide Whole Numbers, Representing Problems using Variable	Knowledge and Skills	4.4 Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:
	Readiness <i>Essential</i>  	4.4(H) solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders
	Supporting	4.4(B) determine products of a number and 10 or 100 using properties of operations and place value understandings
	Supporting	4.4(C) represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15



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Suggested Pacing: November 15 - January 28	Supporting	4.4(D) use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties
	Supporting	4.4(E) represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations
	Supporting	4.4(F) use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor
	Knowledge and Skills	4.5 Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:
	Readiness <i>Essential</i>	4.5(A) represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity
	Readiness	4.5(B) represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence



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Cluster 4


In this cluster, students will be **using models to determine the formulas for perimeter and area of rectangles**. Students will also continue their learning about analyzing **geometric attributes** of two and three dimensional shapes. Solving problems involving **angles less than or equal to 180 degrees** is an important skill of this cluster and it is only addressed in Grade 4. Students in this cluster will also **select appropriate customary and metric units**, strategies, and tools to solve problems involving measurement.

Spiral Essentials

The following essential standard from the previous cluster should be spiraled throughout this cluster during **number sense routines, learning stations, and small group instruction** based on formative assessments. *Process Standards should be taught throughout all components of the workshop (see page 1).*

4.4(H) solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders

4.5(A) represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity

<p>Cluster 4: Using Models to Determine Perimeter and Area, Geometric Attributes</p> <p>Suggested Pacing: January 31 - April 14</p> <p>Snapshot Window: February 14 - February 17</p>	Knowledge and Skills	4.5 Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:
	Supporting	4.5(C) use models to determine the formulas for the perimeter of a rectangle ($l+w+l+w$ or $2l+2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$)
	Readiness <i>Essential</i>	4.5(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers
	Knowledge and Skills	4.6 Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to:
	Supporting 	4.6(A) identify points, lines, line segments, rays, angles, and perpendicular and parallel lines
	Knowledge and Skills	4.7 Geometry and measurement. The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees. The student is expected to:
	Readiness	4.7(C) determine the approximate measures of angles in degrees to the nearest whole number using a protractor



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Supporting	4.7 (A) illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is “cut out” by the rays of the angle. Angle measures are limited to whole numbers
Supporting	4.7(B) illustrate degrees as the units used to measure an angle, where $\frac{1}{360}$ of any circle is one degree and an angle that “cuts” $\frac{n}{360}$ out of any circle whose center is at the angle’s vertex has a measure of n degrees Angle measures are limited to whole numbers
Supporting	4.7(D) draw an angle with a given measure
Supporting	4.7(E) determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures
Knowledge and Skills	4.6 Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to:
Readiness	4.6(D) classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size
Supporting	4.6(B) identify and draw one or more lines of symmetry, if they exists, for a two-dimensional figure
Supporting	4.6(C) apply knowledge of right angles to identify acute, right, and obtuse triangles
Knowledge and Skills	4.8 Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement The student is expected to:
Readiness	4.8(C) solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate
Supporting	4.8(A) identify relative sizes of measurement units within the customary and metric systems
Supporting	4.8(B) convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table



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Cluster 5

In this cluster, students will **solve problems by collecting, organizing, displaying, and interpreting data**. **Personal financial literacy** is also addressed within this cluster. Students might use their decimal addition and subtraction knowledge during this time as they begin to look at managing one's financial resources effectively for a lifetime of financial security.

Spiral Essentials

The following essential standard from the previous cluster should be spiraled throughout this cluster during **number sense routines, learning stations, and small group instruction** based on formative assessments. *Process Standards should be taught throughout all components of the workshop (see page 1).*

4.5(D) solve problems related to perimeter and area of rectangles where dimensions are whole numbers

<p>Cluster 5: Data and Personal Financial Literacy</p> <p>Suggested Pacing: April 19 - May 6</p>	Knowledge and Skills	4.9 Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:
	Readiness 	4.9(A) represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions
	Supporting	4.9 (B) solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot
	Knowledge and Skills	4.10 Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
	Supporting	4.10(A) distinguish between fixed and variable expenses
	Supporting	4.10(B) calculate profit in a given situation
	Supporting	4.10(C) compare the advantages and disadvantage of various savings options
	Supporting	4.10(D) describe how to allocate a weekly allowance among spending, saving, including for college and sharing
	Supporting	4.10(E) describe how the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending



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Cluster 6: Gearing up for Fifth Grade

Process Standards should be taught throughout all components of the workshop (see page 1).

Cluster 6: Gearing up for Fifth Grade	Knowledge and Skills	4.3 Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:
Suggested Pacing: May 9 - May 20	Readiness <i>Essential</i>	4.3(E) represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations



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