

Boyd County Schools



Mathematics Curriculum Framework

Fourth Grade

Topic 1: Place Value and Rounding

Week 1	Week 2
<p>Standards</p> <ul style="list-style-type: none">· 4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.· 4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.· 4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.	
<p>Learning Targets:</p> <ul style="list-style-type: none">● I can write numbers in standard form, expanded form and number words through one million.● I can compare two multi digit numbers.● I can recognize each digit is 10 times the digit in the place to its right.● I can round a number to tens, hundreds and thousands.	
<p>Vocabulary</p> <p>Place Value (ones, tens, hundreds, etc.), Expanded Form, Standard Form, Word Form, Base Ten Expanded Form, less than, greater than</p>	
<p>Special Considerations:</p> <p>*** 4.NBT.2 before 4.NBT.1 --- Make sure to grasp a foundational understanding of reading and writing numbers up to 1,000,000 (NO HIGHER) before recognizing 10 times more or 10 times less skill.</p> <p>*** Compare numbers based on the place value of the digits.</p>	
<p>Resources:</p> <p>Illustrative Math</p> <ul style="list-style-type: none">● What's My Number?● Thousands and Millions of Fourth Graders● Threatened and Endangered● Ordering 4-digit numbers	

- [Rounding on the Number Line](#)
- [Rounding to the Nearest 1000](#)
- [Rounding to the Nearest 100 and 1000](#)

3-Act Math

- [Where's the Beef](#)

Assessments:

Topic 2 - Addition and Subtraction

Week 1	Week 2	Week 3
<p>Standards</p> <p>4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p> <p>4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>		
<p>Learning Targets:</p> <ul style="list-style-type: none"> • I can add and subtract multi-digit numbers. • I can solve two-step word problems using addition and subtraction. • I can identify missing variable in addition and subtraction problems. 		
<p>Vocabulary</p> <p>Regroup, add, subtract, sum, difference, place value vocabulary, part, whole, variable</p>		
<p>Special Considerations:</p> <p>*** This is a required standard for students to master using standard algorithm before promotion to the fifth grade.</p> <p>*** Refer to STAR for assistance. Address 4.OA.A. Practice questions can be found on STAR Custom.</p> <p>*** Discuss specific vocabulary that references addition and subtraction.</p>		

*** Practice the skill of estimating and solving addition and subtraction equations.

Resources:

STAR Custom

Illustrative Math

- [Carnival Tickets](#)
- [Karl's Garden](#)

Assessments

KDE Formative Assessment Lessons (FALS)

- [Number and Operations Base Ten: Multi-Digit Multiplication Strategies](#)

Topic 3 - Multiplicative Comparisons/Factors & Multiples

Week 1	Week 2	Week 3
<p>Standards</p> <p>4.OA.1. <u>Interpret</u> a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <p>4.OA.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</p> <p>4.OA.4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. <u>Determine</u> whether a given whole number in the range 1–100 is a multiple of a given one-digit number. <u>Determine</u> whether a given whole number in the range 1–100 is prime or composite.</p>		
<p>Learning Targets</p> <ul style="list-style-type: none">• I can identify missing variables in simple multiplication and division facts.• I can find factor pairs for a whole number to 100.		

- I can find multiples to 100 of a one digit number.
- I can identify prime and composite numbers to 100.

Vocabulary

Factor, multiple, product, prime, composite, variable, quotient, multiplicative comparison

Special Considerations

*** Unit 3 will be broken down into specific skills. Pay close attention to exactly what each standards says. 4.OA.2 needs to be represented in DRAWINGS AND EQUATIONS.

*** Range is 1-100

*** Develop a conceptual understanding of what multiplicative comparison looks like before applying this skill to procedural problems.

Resources

Illustrative Math

- [Thousands and Millions of Fourth Graders](#)
- [Threatened and Endangered](#)
- [Comparing Money Raised](#)
- [The Locker Game](#)
- [Multiplicative Comparisons](#)

3-Act Math

- [Dill 'er Up](#)

Assessments

Unit 4- Multiplication

Week 1	Week 2	Week 3
<p>Standards</p> <p>4.NBT.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p> <p>4.OA.3. Solve multistep word problems posed with whole numbers and having whole number answers using the four Operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies.</p>		
<p>Learning Targets</p> <ul style="list-style-type: none">● I can multiply one digit whole numbers by multiples of ten.● I can multiply a four digit number by a one digit number.● I can multiply 2- two digit numbers.● I can solve multiplication word problems that use symbols for the unknown numbers.		
<p>Vocabulary</p> <p>Multiply, arrays, factor, multiple, product, variable, regroup, equal groups.</p>		
<p>Special Considerations:</p> <p>*** Before multiplying, students should have a conceptual understanding of multiplying a one-digit by a multiple of ten.</p> <p>*** Use multiple strategies for multiplying a one-digit number by a 2,3, or 4-digit number such as area model and partial product. *** **</p> <p>Students should use strategies based on place value, and demonstrate their understanding with words, pictures, numbers, and mental math strategies.</p> <p>*** When solving multiplication word problems, determine words that instruct students to multiply.</p>		
<p>Resources</p> <p>Illustrative Math</p> <ul style="list-style-type: none">● Carnival Tickets● Karl's Garden● Thousands and Millions of Fourth Graders		

3-Act Math

- [Array-bow of Colors](#)
- [Krispy Kreme Me](#)

Assessments:

Unit Assessment Multiplication

Formative Assessment Lessons (FAL)

- [Factors and Multiples Number Puzzles](#)

Topic 5- Review of Benchmark 1 Standards

Week 1

Standards

Review of all 1st 9 weeks' benchmark standards.

Learning Targets

- Review of all 1-9 week's learning targets

Vocabulary

Review of all 1st 9 weeks' vocabulary

Special Considerations

*** Review of all 1st 9 weeks' special considerations

Resources

Assessments

Benchmark Assessment

Unit 6- Parallel and Perpendicular; Symmetry

Week 1

Week 2

Standards

4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Learning Targets

- I can draw points, lines, line segments, rays, and angles.
- I can draw perpendicular and parallel lines.
- I can classify figures based on parallel and perpendicular lines.
- I can identify symmetrical figures and draw lines of symmetry.

Vocabulary

point, vertex, line, line segment, parallel, perpendicular, symmetry, angles (right, obtuse, acute)

2d figures- circle, triangle (by sides- equilateral, scalene, isosceles; by angles- right, obtuse, acute), quadrilaterals- rhombus, trapezoid, rectangle, square, hexagon, octagon

Special Considerations

*** This unit is vocabulary heavy. Students need to end this unit with a strong relationship between the vocabulary word, its meaning, and the visual model of what it looks like.

*** Classifying figures → Be specific according to the sides and the angles.

Resources

Illustrative Math

- [Measuring Angles](#)
- [The Geometry of Letters](#)
- [What's the Point?](#)
- [Are these right?](#)

- [Defining Attributes of Rectangles and Parallelograms](#)
- [Finding an unknown angle](#)
- [What is a Trapezoid? \(Part 1\)](#)
- [What shape am I?](#)
- [Finding Lines of Symmetry](#)
- [Lines of symmetry for circles](#)
- [Lines of symmetry for quadrilaterals](#)
- [Lines of symmetry for triangles](#)

Assessments

KDE Formative Assessment Lessons

- [Geometry Two Dimensional Shapes Angles, and Symmetry](#)

Unit 6: Angles

Week 1	Week 2
<p>Standards</p> <p>4.MD.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:</p> <p>4.MD.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p> <p>4.MD.7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</p>	
<p>Learning Targets</p> <ul style="list-style-type: none"> • I can recognize that angles are formed when 2 rays share the same endpoint. • I can measure angles using a protractor. • I can draw angles using a protractor. • I can find unknown angle measures using addition or subtraction. • I can use a variable to find an unknown angle measure. 	

Vocabulary

Right angle, acute angle, straight angle, measure, protractor, ray, line, line segment, variable, complementary angle, supplementary angle

Special Considerations

- *** Students need to have understanding of basic geometric terms such as line, line segment, ray, point, parallel, perpendicular, and intersecting lines.
- *** Understand the concept of an angle being two rays with a common endpoint.
- *** Include procedures for measuring and drawing angles.
- *** Develop understanding that angles can be taken apart. (decomposed)
- *** When finding complementary and supplementary unknown angle measures implement understanding that a straight angle is 180 degrees.
- *** Label angles when measuring and drawing.
- *** Incorporate real world application with the use of a clock.

Resources

- Reference the clock as an angle and measuring angles

Illuminative Mathematics

- [Measuring Angles](#)
- [Finding an Unknown Angle](#)

Assessments

Unit Assessment

UNIT 7: Area and Perimeter

Week One

Week Two

Standards

4.MD.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Learning Targets

- I can identify that the formula for the perimeter of a rectangle is $2L + 2W$ or $L + L + W + W$.
- I can identify that the formula for the area of a rectangle is $L \times W$.
- I can apply the formula for perimeter of a rectangle to solve real world and mathematical problems.
- I can apply the formula for area of a rectangle to solve real world and mathematical problems.
- I can solve area and perimeter problems in which there is an unknown factor (n).

Vocabulary-

area, perimeter, missing parts/wholes, formula, variable

Special Considerations

*** Focus on the use of a missing part or whole as a variable. EX: 20 feet = $L + L + 5$ feet + 5 feet (Also as) $P = 5$ feet + 5 feet + 5 feet + 5 feet

*** Incorporate REAL WORLD relationships with this standard for application understanding.\

*** Below are the 3rd grade pre-requisite standards that students need to review and have a conceptual understanding of before introducing the 4th grade standard above.

- *3.MD.5ab Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.*
- *3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).*
- *3.MD.7d Relate area to the operations of multiplication and addition. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.*

Resources

Illustrative Mathematics

- [Karl's Garden](#)

Assessments

KDE Formative Assessments Lessons (FALS)

UNIT 8: Fractions - Equivalence and Comparing

Week 1

Week 2

Standards:

4.NF.1. Explain why a fraction a/b is equivalent to a fraction $(n \cdot a)/(n \cdot b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Learning Targets

- I can understand that a fraction is an equal part of a whole.
- I can identify a mixed number in between two whole numbers on a number line.
- I can represent fractions on a number line.
- I can find equivalent fractions.
- I can identify mixed numbers and improper fractions.
- I can convert mixed numbers and improper fractions.
- I can use mental math and estimation to determine whether my answer is reasonable.

Vocabulary

numerator, denominator, equivalent, whole, part, simplify, improper fraction, mixed number, equal parts, visual model, compare, halves, third, etc.

Special Considerations

- *** Students need to understand that a fraction is a part of a whole.
- *** Develop understanding of what the numerator represents as well as the denominator.
- *** Use a number line to develop understanding that a mixed number contains a fraction, which lies between two whole numbers.
- *** Using pictures, illustrate equivalent fractions and discuss why they are equal.
- *** When comparing two fractions, draw models to recognize comparisons.
- *** Find common denominators for two fractions with unlike denominators.
- *** Ordering fractions from least to greatest, and greatest to least is included in this unit.

Resources

- Use a number line to demonstrate mixed numbers.

- Use fraction parts to develop understanding of comparing two fractions.

Illustrative Math

- [Money in the piggy bank](#)
- [Running Laps](#)
- [Explaining Fraction Equivalence with Pictures](#)
- [Fractions and Rectangles](#)
- [Doubling Numerators and Denominators](#)
- [Listing fractions in increasing size](#)
- [Using Benchmarks to Compare Fractions](#)

Achieve the Core

- [Human-Sized Number Lines: Let's Compare Fractions](#)

Assessments

Unit Assessment

UNIT 9: Fractions – Add/Subtract/Multiply

Week 1	Week 2	Week 3	Week 4
<p>Standards</p> <p>4.NF.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.</p> <p>4.NF.3.a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p> <p>4.NF.3.b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. <i>Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.</i></p> <p>4.NF.3.c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</p> <p>4.NF.3.d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p> <p>4.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p>			

4.NF.4.a. Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*

4.NF.4.b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)

4.NF.4.c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Learning Targets

- I can show a fraction as a sum of fractions with the same denominator (E.g. $3/8=1/8+1/8+1/8$)
- I can add and subtract fractions with the same denominator.
- I can add and subtract mixed numbers.
- I can solve word problems using fractions with like denominators.
- I can understand a fraction as a multiple of a unit fraction.
- I can multiply a fraction by a whole number.

Vocabulary

decompose, numerator, denominator, mixed number, improper fraction, unit fraction, sum, difference, product

Special Considerations:

*** Spend QUALITY time DECOMPOSING fractions to build a conceptual understanding of what unit fractions pieces are before adding and subtracting fractions.

Resources

Illustrative Math

- [Comparing two different pizzas](#)
- [Comparing Sums of Unit Fractions](#)
- [Making 22 Seventeenths in Different Ways](#)
- [Cynthia's Perfect Punch](#)
- [Peaches](#)
- [Plastic Building Blocks](#)

- [Writing a Mixed Number as an Equivalent Fraction](#)
- [Extending Multiplication From Whole Numbers to Fractions](#)
- [Sugar in six cans of soda](#)

3-Act Math

- [Do the Dew](#)
- [The Apple](#)

Assessments

Unit Assessment

KDE Formative Assessment Lessons (FALS)

- [Relating Fractional Equivalencies to Decimal Fractions](#)

UNIT 10: Decimals

Week 1	Week 2
<p>Standards</p> <p>4.NF.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.</p> <p>4.NF.6. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</p> <p>4.NF.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.</p>	
<p>Learning Targets</p> <ul style="list-style-type: none"> • I can change fractions with 10 as the denominator to equivalent fractions with 100 as the denominator. • I can convert fractions with denominators of 10 or 100 to decimals. • I can compare decimals to the hundredths place. 	

- I can add and subtract decimals to the hundredths place.

Vocabulary

tenth, hundredth, thousandth, decimal, equivalent, convert, compare, sum, difference, add, subtract, (vocabulary involving money.)

Special Considerations:

*** Students must recognize the meaning of a tenth and a hundredth. When discussing decimals, relate decimals to fractions with a denominator of 10 and 100.

*** Create equivalent fractions with denominators of 10 and 100 to add and subtract decimals.

Resources

Illustrative Math

- [Adding Tenths and Hundredths](#)
- [Dimes and Pennies](#)
- [Expanded Fractions and Decimals](#)
- [Fraction Equivalence](#)
- [How Many Tenths and Hundredths?](#)
- [Using Place Value](#)

Assessments

Unit Assessment

REVIEW WEEK FOR BENCHMARK 3 STANDARDS

Week 1

Standards

All Standards from Benchmark 3.

Learning Targets

All Learning Targets from Benchmark 3

Vocabulary

All Vocabulary from Benchmark 3

Special Considerations

*** Up To One Week

Resources**Assessments**

UNIT 11: Division

Week 1**Week 2****Standards**

4.NBT.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Learning Targets

- I can divide up to four-digit dividends by one-digit divisors with and without remainders.
- I can solve division word problems that use symbols for the unknown numbers.
- I can use mental math and estimation to determine whether my answer is reasonable.
- I can solve a word problem that includes letters representing numbers.
- I can choose the correct operation to solve a word problem.

Vocabulary

dividend, divisor, quotient, estimate, remainder, equal grouping, each, share

Special Considerations

***Use the foundational understanding of multiplication and grouping to extend into division.

*** Practice with real world problems that require students to use reasoning skills to determine what to do with the remainder. EX: drop it, round it up, exact answer left over.

*** Teach using various strategies including; the forgiveness method, traditional method.

Resources

Illustrative Mathematics

- [Mental Division Strategy](#)
- [Carnival Tickets](#)
- [Karl's Garden](#)

Assessments

UNIT 12: Measurement and Graphing

Week 1	Week 2	Week 3	Week 4
Standards 4.MD.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft. is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36)			

4.MD.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Graphing

4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Learning Targets

- I can convert measurements within a single system.
- I can record measurement equivalents in a chart or table.
- I can solve word problems using measurements.
- I can measure and estimate liquid volumes and masses of objects.
- I can solve division facts.

Vocabulary

measure, equivalent, convert, kilometer, meter, centimeter, pound, kilogram, gram, ounce, liter, milliliter, hour, minute, second

Special Considerations

*** Students need to apply problem solving skills in order to understand how to convert different measurements including length, weight, time, and money.

*** Use input and output tables to determine conversions.

*** The skills of time and money should be incorporated into other units throughout the year (EX: Decimals, fractions, and angles)

Resources

Illustrative Mathematics

- [Who is the tallest?](#)
- [Margie Buys Apples](#)
- [Button Diameters](#)

Achieve the Core

[Human-Sized Number Lines: Let's Compare Fractions](#)

Assessments