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## Grade 4 | Kentucky Mathematics Course Standards (2019) Correlation to *Eureka Math*<sup>2</sup>® (2027)

*Eureka Math*<sup>2</sup> is a research-proven math curriculum that empowers teachers to center instructional techniques on student success. Teachers can foster more “aha!” learning moments by providing the support needed for all learners to build a more confident math mindset.

This *Eureka Math*<sup>2</sup> edition builds on a strong foundation of effective instruction. It provides teachers with guidance on delivering rigorous instruction that honors student choice and encourages confident problem-solving.

*Eureka Math*<sup>2</sup> carefully sequences mathematical content to maximize vertical alignment from kindergarten through high school. This kind of sequencing has proven to be essential in students’ mastery of math.

### Teachability

*Eureka Math*<sup>2</sup> employs streamlined materials that allow teachers to plan more efficiently and focus their energy on delivering high-quality instruction that meets the individual needs of their students. Differentiation suggestions, slide decks, digital interactives, and multiple forms of assessment are just a few of the resources built into the teacher materials.

### Accessibility

*Eureka Math*<sup>2</sup> incorporates Universal Design for Learning (UDL) principles so all learners can access the mathematics and take on challenging math concepts. UDL, Differentiation, and Multilingual Learner supports are built into the instructional design and are clearly identified in the *Teach* book.

The curriculum also carries a focus on readability. By eliminating unnecessary words and using clear sentences, the *Eureka Math*<sup>2</sup> teacher-writers have created one of the most readable mathematics curricula on the market. The curriculum’s readability and accessibility help all students see themselves as mathematical thinkers and doers who are fully capable of owning their mathematics learning.

### Math Confidence

*Eureka Math*<sup>2</sup> fosters a classroom culture of learning by encouraging student-led discourse and cognitive engagement that results in confident learners. By leveraging consistent models, routines, and progressions, teachers can remove barriers and allow all students an avenue to success. Within the digital platform, each grade includes wordless videos and digital interactives that spark students’ curiosity and help them make conceptual connections. Using the *Learn* books, students wonder, explore, and make sense of mathematics, which helps them develop a strong, positive mathematical identity.

Standards for Mathematical Practice	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>MP.1</b> Make sense of problems and persevere in solving them.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.2</b> Reason abstractly and quantitatively.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.3</b> Construct viable arguments and critique the reasoning of others.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.4</b> Model with mathematics.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.5</b> Use appropriate tools strategically.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.6</b> Attend to precision.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.7</b> Look for and make use of structure.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p><b>MP.8</b> Look for and express regularity in repeated reasoning.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>

## Operations and Algebraic Thinking

Use the four operations with whole numbers to solve problems.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.OA.1</b></p> <p>Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.</p>	<p>4 M1 Lesson 1: Interpret multiplication as multiplicative comparison.</p> <p>4 M1 Lesson 2: Solve multiplicative comparison problems with unknowns in various positions.</p> <p>4 M1 Lesson 3: Describe relationships between measurements by using multiplicative comparison.</p> <p>4 M1 Lesson 4: Represent the composition of larger units of money by using multiplicative comparison.</p> <p>4 M1 Lesson 6: Demonstrate that a digit represents 10 times the value of what it represents in the place to its right.</p>
<p><b>KY.4.OA.2</b></p> <p>Multiply or divide to solve word problems involving multiplicative comparisons 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 M1 Lesson 1: Interpret multiplication as multiplicative comparison.</p> <p>4 M1 Lesson 2: Solve multiplicative comparison problems with unknowns in various positions.</p> <p>4 M1 Lesson 3: Describe relationships between measurements by using multiplicative comparison.</p> <p>4 M1 Lesson 4: Represent the composition of larger units of money by using multiplicative comparison.</p> <p>4 M2 Lesson 9: Solve multiplication word problems.</p> <p>4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.</p>
<p><b>KY.4.OA.3</b></p> <p>Solve multistep problems.</p>	<p>4 M1 Lesson 15: Apply estimation to real-world situations by using rounding.</p> <p>4 M1 Lesson 16: Add by using the standard algorithm.</p> <p>4 M1 Lesson 17: Solve multi-step addition word problems by using the standard algorithm.</p> <p>4 M1 Lesson 21: Solve two-step word problems by using addition and subtraction.</p> <p>4 M1 Lesson 22: Solve multi-step word problems by using addition and subtraction.</p> <p>4 M3 Lesson 21: Find whole-number quotients and remainders.</p> <p>4 M3 Lesson 22: Represent, estimate, and solve division word problems.</p> <p>4 M3 Lesson 23: Solve multi-step word problems and interpret remainders.</p> <p>4 M3 Lesson 24: Solve multi-step word problems and assess the reasonableness of solutions.</p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.OA.3.a</b></p> <p>Perform operations in the conventional order when there are no parentheses to specify a particular order.</p>	<p><i>Supplemental material is necessary to address this standard.</i></p>
<p><b>KY.4.OA.3.b</b></p> <p>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 computations and estimation strategies including rounding.</p>	<p>4 M1 Lesson 15: Apply estimation to real-world situations by using rounding.</p> <p>4 M1 Lesson 16: Add by using the standard algorithm.</p> <p>4 M1 Lesson 17: Solve multi-step addition word problems by using the standard algorithm.</p> <p>4 M1 Lesson 21: Solve two-step word problems by using addition and subtraction.</p> <p>4 M1 Lesson 22: Solve multi-step word problems by using addition and subtraction.</p> <p>4 M3 Lesson 21: Find whole-number quotients and remainders.</p> <p>4 M3 Lesson 22: Represent, estimate, and solve division word problems.</p> <p>4 M3 Lesson 23: Solve multi-step word problems and interpret remainders.</p> <p>4 M3 Lesson 24: Solve multi-step word problems and assess the reasonableness of solutions.</p>

## Operations and Algebraic Thinking

Gain familiarity with factors and multiples.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.OA.4</b></p> <p>Find factors and multiples of numbers in the range 1–100.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>

**Kentucky Mathematics Course Standards**

**Aligned Components of *Eureka Math*<sup>2</sup>**

<p><b>KY.4.OA.4.a</b></p> <p>Find all factor pairs for a given whole number.</p>	<p>4 M2 Lesson 21: Find factor pairs for numbers up to 100 and use factors to identify numbers as prime or composite.</p> <p>4 M2 Lesson 22: Use division and the associative property of multiplication to find factors.</p> <p>4 M2 Lesson 23: Determine whether a whole number is a multiple of another number.</p> <p>4 M2 Lesson 24: Recognize that a number is a multiple of each of its factors.</p> <p>4 M2 Lesson 25: Explore properties of prime and composite numbers up to 100 by using multiples.</p> <p>5 M1 Lesson 21: Express a composite number to 50 as a product of its prime factors.</p>
<p><b>KY.4.OA.4.b</b></p> <p>Recognize that a whole number is a multiple of each of its factors.</p>	<p>4 M2 Lesson 21: Find factor pairs for numbers up to 100 and use factors to identify numbers as prime or composite.</p> <p>4 M2 Lesson 22: Use division and the associative property of multiplication to find factors.</p> <p>4 M2 Lesson 23: Determine whether a whole number is a multiple of another number.</p> <p>4 M2 Lesson 24: Recognize that a number is a multiple of each of its factors.</p> <p>4 M2 Lesson 25: Explore properties of prime and composite numbers up to 100 by using multiples.</p> <p>5 M1 Lesson 21: Express a composite number to 50 as a product of its prime factors.</p>
<p><b>KY.4.OA.4.c</b></p> <p>Determine whether a given whole number is a multiple of a given one-digit number.</p>	<p>4 M2 Lesson 21: Find factor pairs for numbers up to 100 and use factors to identify numbers as prime or composite.</p> <p>4 M2 Lesson 22: Use division and the associative property of multiplication to find factors.</p> <p>4 M2 Lesson 23: Determine whether a whole number is a multiple of another number.</p> <p>4 M2 Lesson 24: Recognize that a number is a multiple of each of its factors.</p> <p>4 M2 Lesson 25: Explore properties of prime and composite numbers up to 100 by using multiples.</p> <p>5 M1 Lesson 21: Express a composite number to 50 as a product of its prime factors.</p>

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<p><b>KY.4.OA.4.d</b> Determine whether a given whole number is prime or composite.</p>	<p>4 M2 Lesson 21: Find factor pairs for numbers up to 100 and use factors to identify numbers as prime or composite.</p> <p>4 M2 Lesson 22: Use division and the associative property of multiplication to find factors.</p> <p>4 M2 Lesson 23: Determine whether a whole number is a multiple of another number.</p> <p>4 M2 Lesson 24: Recognize that a number is a multiple of each of its factors.</p> <p>4 M2 Lesson 25: Explore properties of prime and composite numbers up to 100 by using multiples.</p> <p>5 M1 Lesson 21: Express a composite number to 50 as a product of its prime factors.</p>
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## Operations and Algebraic Thinking

Generate and analyze patterns.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.OA.5</b></p> <p>Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern not explicit in the rule itself.</p>	<p>4 M2 Lesson 26: Use relationships within a pattern to find an unknown term in the sequence.</p>

## Number and Operations in Base Ten

Generalize place value understanding for multi-digit whole numbers.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NBT.1</b></p> <p>Recognize in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.</p>	<p>4 M1 Lesson 6: Demonstrate that a digit represents 10 times the value of what it represents in the place to its right.</p>
<p><b>KY.4.NBT.2</b></p> <p>Represent and compare multi-digit whole numbers.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>

**Kentucky Mathematics Course Standards**

**Aligned Components of *Eureka Math*<sup>2</sup>**

<p><b>KY.4.NBT.2.a</b></p> <p>Read and write multi-digit whole numbers using base-ten numerals, number names and expanded form.</p>	<p>4 M1 Lesson 5: Organize, count, and represent a collection of objects.</p> <p>4 M1 Lesson 7: Write numbers to 1,000,000 in unit form and expanded form by using place value structure.</p> <p>4 M1 Lesson 8: Write numbers to 1,000,000 in standard form and word form.</p> <p>4 M1 Lesson 9: Compare numbers within 1,000,000 by using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math>.</p> <p>4 M1 Lesson 10: Name numbers by using place value understanding.</p> <p>4 M1 Lesson 11: Find 1, 10, and 100 thousand more than and less than a given number.</p>
<p><b>KY.4.NBT.2.b</b></p> <p>Compare two multi-digit numbers based on meanings of the digit in each place, using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math> symbols to record the results of comparisons.</p>	<p>4 M1 Lesson 5: Organize, count, and represent a collection of objects.</p> <p>4 M1 Lesson 7: Write numbers to 1,000,000 in unit form and expanded form by using place value structure.</p> <p>4 M1 Lesson 8: Write numbers to 1,000,000 in standard form and word form.</p> <p>4 M1 Lesson 9: Compare numbers within 1,000,000 by using <math>&gt;</math>, <math>=</math>, and <math>&lt;</math>.</p> <p>4 M1 Lesson 10: Name numbers by using place value understanding.</p> <p>4 M1 Lesson 11: Find 1, 10, and 100 thousand more than and less than a given number.</p>
<p><b>KY.4.NBT.3</b></p> <p>Use place value understanding to round multi-digit whole numbers to any place.</p>	<p>4 M1 Lesson 12: Round to the nearest thousand.</p> <p>4 M1 Lesson 13: Round to the nearest ten thousand and hundred thousand.</p> <p>4 M1 Lesson 14: Round multi-digit numbers to any place.</p> <p>4 M1 Lesson 15: Apply estimation to real-world situations by using rounding.</p>

## Number and Operations in Base Ten

Use place value understanding and properties of operations to perform multi-digit arithmetic.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NBT.4</b></p> <p>Fluently add and subtract multi-digit whole numbers using an algorithm.</p>	<p>4 M1 Lesson 16: Add by using the standard algorithm.</p> <p>4 M1 Lesson 17: Solve multi-step addition word problems by using the standard algorithm.</p> <p>4 M1 Lesson 18: Subtract by using the standard algorithm, decomposing larger units once.</p> <p>4 M1 Lesson 19: Subtract by using the standard algorithm, decomposing larger units up to 3 times.</p> <p>4 M1 Lesson 20: Subtract by using the standard algorithm, decomposing larger units multiple times.</p> <p>4 M1 Lesson 21: Solve two-step word problems by using addition and subtraction.</p> <p>4 M1 Lesson 22: Solve multi-step word problems by using addition and subtraction.</p>
<p><b>KY.4.NBT.5</b></p> <p>Multiply whole numbers:</p> <ul style="list-style-type: none"> <li>Up to four-digit number by a one-digit number</li> <li>Two-digit number by two-digit number</li> </ul> <p>Multiply 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 M2 Lesson 1: Multiply multiples of 10 by one-digit numbers by using the associative property of multiplication.</p> <p>4 M2 Lesson 4: Multiply by using familiar strategies.</p> <p>4 M2 Lesson 5: Multiply by using place value strategies and the distributive property.</p> <p>4 M2 Lesson 6: Multiply with regrouping by using place value strategies and the distributive property.</p> <p>4 M2 Lesson 7: Multiply by using an area model and the distributive property.</p> <p>4 M2 Lesson 8: Multiply by applying the distributive property and write equations.</p> <p>4 M2 Lesson 9: Solve multiplication word problems.</p> <p>4 M2 Lesson 10: Multiply by applying simplifying strategies.</p> <p>4 M3 Lesson 2: Multiply by multiples of 100 and 1,000.</p> <p>4 M3 Lesson 3: Multiply a two-digit multiple of 10 by a two-digit multiple of 10.</p> <p>4 M3 Lesson 9: Apply place value strategies to multiply three-digit numbers by one-digit numbers.</p> <p>4 M3 Lesson 10: Apply place value strategies to multiply four-digit numbers by one-digit numbers.</p> <p>4 M3 Lesson 11: Represent multiplication by using partial products.</p>

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<p><b>KY.4.NBT.5 <i>continued</i></b></p>	<p>4 M3 Lesson 12: Multiply by using various recording methods in vertical form.</p> <p>4 M3 Lesson 13: Multiply two-digit numbers by two-digit multiples of 10.</p> <p>4 M3 Lesson 14: Apply place value strategies to multiply two-digit numbers by two-digit numbers.</p> <p>4 M3 Lesson 15: Multiply with four partial products.</p> <p>4 M3 Lesson 16: Multiply with two partial products.</p> <p>4 M3 Lesson 17: Apply the distributive property to multiply.</p>
<p><b>KY.4.NBT.6</b></p> <p>Divide up to four-digit dividends by one-digit divisors. Find whole number quotients and remainders using:</p> <ul style="list-style-type: none"> <li>• strategies based on place value</li> <li>• the properties of operations</li> <li>• the relationship between multiplication and division</li> </ul> <p>Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.</p>	<p>4 M2 Lesson 2: Divide two- and three-digit multiples of 10 by one-digit numbers.</p> <p>4 M2 Lesson 11: Divide by using familiar strategies.</p> <p>4 M2 Lesson 12: Divide two-digit numbers by one-digit numbers by using an area model.</p> <p>4 M2 Lesson 13: Divide three-digit numbers by one-digit numbers by using an area model.</p> <p>4 M2 Lesson 14: Divide two-digit numbers by one-digit numbers by using place value strategies.</p> <p>4 M2 Lesson 15: Divide three-digit numbers by one-digit numbers by using place value strategies.</p> <p>4 M2 Lesson 16: Divide by using the break apart and distribute strategy.</p> <p>4 M3 Lesson 1: Divide multiples of 100 and 1,000.</p> <p>4 M3 Lesson 4: Apply place value strategies to divide hundreds, tens, and ones.</p> <p>4 M3 Lesson 5: Apply place value strategies to divide thousands, hundreds, tens, and ones.</p> <p>4 M3 Lesson 6: Connect pictorial representations of division to long division.</p> <p>4 M3 Lesson 7: Represent division by using partial quotients.</p> <p>4 M3 Lesson 8: Choose and apply a method to divide multi-digit numbers.</p> <p>4 M3 Lesson 21: Find whole-number quotients and remainders.</p> <p>4 M3 Lesson 22: Represent, estimate, and solve division word problems.</p>

## Number and Operations—Fractions

Extend understanding of fraction equivalence and ordering.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NF.1</b></p> <p>Understand and generate equivalent fractions.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.NF.1.a</b></p> <p>Use visual fraction models to recognize and generate equivalent fractions that have different numerators/denominators even though they are the same size.</p>	<p>4 M4 Lesson 8: Generate equivalent fractions with smaller units for unit fractions.</p> <p>4 M4 Lesson 9: Generate equivalent fractions with smaller units for non-unit fractions.</p> <p>4 M4 Lesson 10: Generate equivalent fractions with larger units.</p> <p>4 M4 Lesson 11: Represent equivalent fractions by using tape diagrams, number lines, and multiplication or division.</p> <p>4 M4 Lesson 12: Generate equivalent fractions for fractions greater than 1 and generate equivalent mixed numbers.</p>
<p><b>KY.4.NF.1.b</b></p> <p>Explain why a fraction <math>\frac{a}{b}</math> is equivalent to a fraction <math>\frac{n \times a}{n \times b}</math>.</p>	<p>4 M4 Lesson 8: Generate equivalent fractions with smaller units for unit fractions.</p> <p>4 M4 Lesson 9: Generate equivalent fractions with smaller units for non-unit fractions.</p> <p>4 M4 Lesson 10: Generate equivalent fractions with larger units.</p> <p>4 M4 Lesson 11: Represent equivalent fractions by using tape diagrams, number lines, and multiplication or division.</p> <p>4 M4 Lesson 12: Generate equivalent fractions for fractions greater than 1 and generate equivalent mixed numbers.</p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NF.2</b></p> <p>Compare two fractions with different numerators and different denominators using the symbols <math>&lt;</math>, <math>=</math>, or <math>&gt;</math>. Recognize comparisons are valid only when the two fractions refer to the same whole. Justify the conclusions.</p>	<p>4 M4 Lesson 13: Compare fractions by using the benchmarks, 0, <math>\frac{1}{2}</math>, and 1.</p> <p>4 M4 Lesson 14: Compare fractions with related denominators.</p> <p>4 M4 Lesson 15: Compare fractions with related numerators.</p> <p>4 M4 Lesson 16: Generate a common numerator or denominator to compare fractions.</p> <p>4 M4 Lesson 17: Apply fraction comparison strategies to compare fractions greater than 1.</p>

### Number and Operations—Fractions

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NF.3</b></p> <p>Understand a fraction <math>\frac{a}{b}</math> with <math>a &gt; 1</math> as a sum of fractions <math>\frac{1}{b}</math>.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.NF.3.a</b></p> <p>Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p>	<p>4 M4 Lesson 1: Decompose whole numbers into a sum of unit fractions.</p> <p>4 M4 Lesson 2: Decompose fractions into a sum of unit fractions.</p> <p>4 M4 Lesson 3: Decompose fractions into a sum of fractions.</p> <p>4 M4 Lesson 4: Represent fractions by using various fraction models.</p> <p>4 M4 Lesson 5: Rename fractions greater than 1 as mixed numbers.</p> <p>4 M4 Lesson 6: Rename mixed numbers as fractions greater than 1.</p> <p>4 M4 Lesson 7: Rename fractions as a sum of equivalent smaller unit fractions.</p> <p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 19: Add and subtract fractions with like units.</p>

**Kentucky Mathematics Course Standards**

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<p><b>KY.4.NF.3.a</b> <i>continued</i></p>	<p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 22: Add two fractions with related units.</p>
<p><b>KY.4.NF.3.b</b></p> <p>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.</p>	<p>4 M4 Lesson 1: Decompose whole numbers into a sum of unit fractions.</p> <p>4 M4 Lesson 2: Decompose fractions into a sum of unit fractions.</p> <p>4 M4 Lesson 3: Decompose fractions into a sum of fractions.</p> <p>4 M4 Lesson 4: Represent fractions by using various fraction models.</p> <p>4 M4 Lesson 5: Rename fractions greater than 1 as mixed numbers.</p> <p>4 M4 Lesson 6: Rename mixed numbers as fractions greater than 1.</p> <p>4 M4 Lesson 7: Rename fractions as a sum of equivalent smaller unit fractions.</p> <p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 19: Add and subtract fractions with like units.</p> <p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 22: Add two fractions with related units.</p>
<p><b>KY.4.NF.3.c</b></p> <p>Add and subtract mixed numbers with like denominators.</p>	<p>4 M4 Lesson 23: Add a fraction to a mixed number.</p> <p>4 M4 Lesson 24: Add a mixed number to a mixed number.</p> <p>4 M4 Lesson 25: Subtract a fraction from a mixed number, part 1.</p> <p>4 M4 Lesson 26: Subtract a fraction from a mixed number, part 2.</p> <p>4 M4 Lesson 27: Subtract a mixed number from a mixed number.</p>

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<p><b>KY.4.NF.3.d</b></p> <p>Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.</p>	<p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 24: Add a mixed number to a mixed number.</p> <p>4 M4 Lesson 27: Subtract a mixed number from a mixed number.</p> <p>4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.</p>
<p><b>KY.4.NF.4</b></p> <p>Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.NF.4.a</b></p> <p>Understand a fraction <math>\frac{a}{b}</math> as a multiple of <math>\frac{1}{b}</math>.</p>	<p>4 M4 Lesson 31: Decompose non-unit fractions into a product of a whole number and a unit fraction.</p>
<p><b>KY.4.NF.4.b</b></p> <p>Understand a multiple of <math>\frac{a}{b}</math> as a multiple of <math>\frac{1}{b}</math> and use this understanding to multiply a fraction by a whole number.</p>	<p>4 M4 Lesson 32: Multiply a fraction by a whole number by using the associative property.</p> <p>4 M4 Lesson 33: Solve word problems involving multiplication of a fraction by a whole number.</p> <p>4 M4 Lesson 34: Multiply a mixed number by a whole number by using the distributive property.</p>
<p><b>KY.4.NF.4.c</b></p> <p>Solve word problems involving multiplication of a fraction by a whole number.</p>	<p>4 M4 Lesson 33: Solve word problems involving multiplication of a fraction by a whole number.</p>

## Number and Operations—Fractions

Understand decimal notation for fractions and compare decimal fractions.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.NF.5</b></p> <p>Convert and add fractions with denominators of 10 and 100.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.NF.5.a</b></p> <p>Convert a fraction with a denominator of 10 to an equivalent fraction with a denominator of 100.</p>	<p>4 M5 Lesson 5: Decompose 1 one and express hundredths in fraction form and decimal form.</p> <p>4 M5 Lesson 6: Represent hundredths as a place value unit.</p> <p>4 M5 Lesson 7: Write mixed numbers in decimal form with hundredths.</p> <p>4 M5 Lesson 8: Represent decimal numbers in expanded form.</p> <p>4 M5 Lesson 12: Apply fraction equivalence to add tenths and hundredths.</p> <p>4 M5 Lesson 13: Apply fraction equivalence to add mixed numbers with tenths and hundredths.</p> <p>4 M5 Lesson 14: Solve word problems with tenths and hundredths.</p>
<p><b>KY.4.NF.5.b</b></p> <p>Add two fractions with respective denominators 10 and 100.</p>	<p>4 M5 Lesson 5: Decompose 1 one and express hundredths in fraction form and decimal form.</p> <p>4 M5 Lesson 6: Represent hundredths as a place value unit.</p> <p>4 M5 Lesson 7: Write mixed numbers in decimal form with hundredths.</p> <p>4 M5 Lesson 8: Represent decimal numbers in expanded form.</p> <p>4 M5 Lesson 12: Apply fraction equivalence to add tenths and hundredths.</p> <p>4 M5 Lesson 13: Apply fraction equivalence to add mixed numbers with tenths and hundredths.</p> <p>4 M5 Lesson 14: Solve word problems with tenths and hundredths.</p>

**Kentucky Mathematics Course Standards**

**Aligned Components of *Eureka Math*<sup>2</sup>**

<p><b>KY.4.NF.6</b></p> <p>Use decimal notation for fractions with denominators 10 or 100.</p>	<p>4 M5 Lesson 1: Organize, count, and represent a collection of money.</p> <p>4 M5 Lesson 2: Decompose 1 one and express tenths in fraction form and decimal form.</p> <p>4 M5 Lesson 3: Represent tenths as a place value unit.</p> <p>4 M5 Lesson 4: Write mixed numbers in decimal form with tenths.</p> <p>4 M5 Lesson 5: Decompose 1 one and express hundredths in fraction form and decimal form.</p> <p>4 M5 Lesson 6: Represent hundredths as a place value unit.</p> <p>4 M5 Lesson 7: Write mixed numbers in decimal form with hundredths.</p> <p>4 M5 Lesson 8: Represent decimal numbers in expanded form.</p>
<p><b>KY.4.NF.7</b></p> <p>Compare two decimals to hundredths.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.NF.7.a</b></p> <p>Compare two decimals to hundredths by reasoning about their size.</p>	<p>4 M5 Lesson 9: Compare measurements expressed as decimal numbers.</p> <p>4 M5 Lesson 10: Use pictorial representations to compare decimal numbers.</p> <p>4 M5 Lesson 11: Compare and order decimal numbers.</p>
<p><b>KY.4.NF.7.b</b></p> <p>Recognize that comparisons are valid only when the two decimals refer to the same whole.</p>	<p>4 M5 Lesson 9: Compare measurements expressed as decimal numbers.</p> <p>4 M5 Lesson 10: Use pictorial representations to compare decimal numbers.</p> <p>4 M5 Lesson 11: Compare and order decimal numbers.</p>
<p><b>KY.4.NF.7.c</b></p> <p>Record the results of comparisons with the symbols <math>&gt;</math>, <math>=</math>, or <math>&lt;</math> and justify the conclusions.</p>	<p>4 M5 Lesson 9: Compare measurements expressed as decimal numbers.</p> <p>4 M5 Lesson 10: Use pictorial representations to compare decimal numbers.</p> <p>4 M5 Lesson 11: Compare and order decimal numbers.</p>

## Measurement and Data

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.MD.1</b></p> <p>Know relative size of measurement units (mass, weight, liquid volume, length, time) within one system of units (metric system, U.S. standard system and time).</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.MD.1.a</b></p> <p>Understand the relationship of measurement units within any given measurement system.</p>	<p>4 M1 Lesson 23: Express metric measurements of length in terms of smaller units.</p> <p>4 M1 Lesson 24: Express metric measurements of mass and liquid volume in terms of smaller units.</p> <p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p>
<p><b>KY.4.MD.1.b</b></p> <p>Within any given measurement system, express measurements in a larger unit in terms of a smaller unit.</p>	<p>4 M1 Lesson 23: Express metric measurements of length in terms of smaller units.</p> <p>4 M1 Lesson 24: Express metric measurements of mass and liquid volume in terms of smaller units.</p> <p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p>

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<p><b>KY.4.MD.1.c</b></p> <p>Record measurement equivalents in a two-column table.</p>	<p>4 M1 Lesson 23: Express metric measurements of length in terms of smaller units.</p> <p>4 M1 Lesson 24: Express metric measurements of mass and liquid volume in terms of smaller units.</p> <p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p>
<p><b>KY.4.MD.2</b></p> <p>Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p><b>KY.4.MD.2.a</b></p> <p>Solve measurement problems involving whole numbers, simple fractions or decimals.</p>	<p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p> <p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 24: Add a mixed number to a mixed number.</p> <p>4 M4 Lesson 27: Subtract a mixed number from a mixed number.</p> <p>4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.</p>

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<p><b>KY.4.MD.2.a</b> <i>continued</i></p>	<p>4 M4 Lesson 33: Solve word problems involving multiplication of a fraction by a whole number.</p> <p>4 M5 Lesson 14: Solve word problems with tenths and hundredths.</p>
<p><b>KY.4.MD.2.b</b></p> <p>Solve problems that require converting a given measurement from a larger unit to a smaller unit within a common measurement system, such as 2 km = 2,000 m.</p>	<p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p> <p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 24: Add a mixed number to a mixed number.</p> <p>4 M4 Lesson 27: Subtract a mixed number from a mixed number.</p> <p>4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.</p> <p>4 M4 Lesson 33: Solve word problems involving multiplication of a fraction by a whole number.</p> <p>4 M5 Lesson 14: Solve word problems with tenths and hundredths.</p>

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<p><b>KY.4.MD.2.c</b></p> <p>Visually display measurement quantities using representations such as number lines that feature a measurement scale.</p>	<p>4 M2 Lesson 17: Express measurements of length in terms of smaller units.</p> <p>4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.</p> <p>4 M3 Lesson 18: Express units of time in terms of smaller units.</p> <p>4 M3 Lesson 19: Express customary measurements of weight in terms of smaller units.</p> <p>4 M3 Lesson 20: Express customary measurements of liquid volume in terms of smaller units.</p> <p>4 M4 Lesson 18: Estimate sums and differences of fractions by using benchmarks.</p> <p>4 M4 Lesson 20: Subtract a fraction from a whole number.</p> <p>4 M4 Lesson 21: Solve addition and subtraction word problems and estimate the reasonableness of the answers.</p> <p>4 M4 Lesson 24: Add a mixed number to a mixed number.</p> <p>4 M4 Lesson 27: Subtract a mixed number from a mixed number.</p> <p>4 M4 Lesson 28: Represent and solve word problems with mixed numbers by using drawings and equations.</p> <p>4 M4 Lesson 33: Solve word problems involving multiplication of a fraction by a whole number.</p> <p>4 M5 Lesson 14: Solve word problems with tenths and hundredths.</p>
<p><b>KY.4.MD.3</b></p> <p>Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.</p>	<p>4 M2 Lesson 3: Investigate and use a formula for the area of a rectangle.</p> <p>4 M2 Lesson 7: Multiply by using an area model and the distributive property.</p> <p>4 M2 Lesson 18: Investigate and use formulas for the perimeter of a rectangle.</p> <p>4 M2 Lesson 19: Apply area and perimeter formulas to solve problems.</p> <p>4 M2 Lesson 20: Solve word problems involving additive and multiplicative comparisons.</p>

## Measurement and Data

Understand and apply the statistics process.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.MD.4</b></p> <p>Use dot plots to analyze data to a statistical question.</p>	<p>4 Data Investigation: Ramp Heights</p> <p>5 Data Investigation: A Typical Night of Sleep</p>
<p><b>KY.4.MD.4.a</b></p> <p>Identify a statistical question focused on numerical data.</p>	<p>4 Data Investigation: Weather Forecasts</p> <p>4 Data Investigation: Ramp Heights</p>
<p><b>KY.4.MD.4.b</b></p> <p>Make a dot plot to display a data set of measurements in fractions of a unit <math>\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)</math>.</p>	<p>4 M4 Lesson 29: Solve problems by using data from a line plot.</p> <p>4 M4 Lesson 30: Represent data on a line plot.</p>
<p><b>KY.4.MD.4.c</b></p> <p>Solve problems involving addition and subtraction of fractions by using information presented in dot plots.</p>	<p>4 M4 Lesson 29: Solve problems by using data from a line plot.</p> <p>4 M4 Lesson 30: Represent data on a line plot.</p>

## Measurement and Data

**Geometric measurement: understand concepts of angle and measure angles.**

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.MD.5</b></p> <p>Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint and understand concepts of angle measurement.</p>	<p>4 M6 Lesson 7: Explore angles as fractional turns through a circle.</p> <p>4 M6 Lesson 8: Use a circular protractor to recognize a <math>1^\circ</math> angle as a turn through <math>\frac{1}{360}</math> of a circle.</p> <p>4 M6 Lesson 9: Identify and measure angles as turns and recognize them in various contexts.</p> <p>4 M6 Lesson 10: Use <math>180^\circ</math> protractors to measure angles.</p> <p>4 M6 Lesson 11: Estimate and measure angles with a <math>180^\circ</math> protractor.</p>
<p><b>KY.4.MD.6</b></p> <p>Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</p>	<p>4 M6 Lesson 8: Use a circular protractor to recognize a <math>1^\circ</math> angle as a turn through <math>\frac{1}{360}</math> of a circle.</p> <p>4 M6 Lesson 10: Use <math>180^\circ</math> protractors to measure angles.</p> <p>4 M6 Lesson 11: Estimate and measure angles with a <math>180^\circ</math> protractor.</p> <p>4 M6 Lesson 12: Use a protractor to draw angles up to <math>180^\circ</math>.</p>
<p><b>KY.4.MD.7</b></p> <p>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.</p>	<p>4 M6 Lesson 13: Decompose angles by using pattern blocks.</p> <p>4 M6 Lesson 14: Find unknown angle measures within right and straight angles.</p> <p>4 M6 Lesson 15: Find unknown angle measures within a decomposed angle of up to <math>180^\circ</math>.</p> <p>4 M6 Lesson 16: Find unknown angle measures around a point.</p>

## Geometry

Draw and identify lines and angles and classify shapes by properties of their lines and angles.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> <sup>2</sup>
<p><b>KY.4.G.1</b></p> <p>Draw points, lines, line segments, rays, angles (right, acute, obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.</p>	<p>4 M6 Lesson 1: Identify and draw points, lines, line segments, rays, and angles.</p> <p>4 M6 Lesson 2: Identify right, acute, obtuse, and straight angles.</p> <p>4 M6 Lesson 3: Draw right, acute, obtuse, and straight angles.</p> <p>4 M6 Lesson 4: Identify, define, and draw perpendicular lines.</p> <p>4 M6 Lesson 5: Identify, define, and draw parallel lines.</p> <p>4 M6 Lesson 6: Relate geometric figures to a real-world context.</p> <p>4 M6 Lesson 10: Use 180° protractors to measure angles.</p> <p>4 M6 Lesson 11: Estimate and measure angles with a 180° protractor.</p> <p>4 M6 Lesson 12: Use a protractor to draw angles up to 180°.</p> <p>4 M6 Lesson 18: Analyze and classify triangles based on side length, angle measures, or both.</p> <p>4 M6 Lesson 19: Construct and classify triangles based on given attributes.</p> <p>4 M6 Lesson 20: Sort polygons based on a given rule.</p>
<p><b>KY.4.G.2</b></p> <p>Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence of absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.</p>	<p>4 M6 Lesson 18: Analyze and classify triangles based on side length, angle measures, or both.</p> <p>4 M6 Lesson 19: Construct and classify triangles based on given attributes.</p> <p>4 M6 Lesson 20: Sort polygons based on a given rule.</p>
<p><b>KY.4.G.3</b></p> <p>Identify lines of symmetry.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>

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<p><b>KY.4.G.3.a</b> Recognize a line of symmetry for a two-dimensional figure.</p>	<p>4 M6 Lesson 17: Recognize, identify, and draw lines of symmetry.</p>
<p><b>KY.4.G.3.b</b> Identify line-symmetric figures and draw lines of symmetry.</p>	<p>4 M6 Lesson 17: Recognize, identify, and draw lines of symmetry.</p>