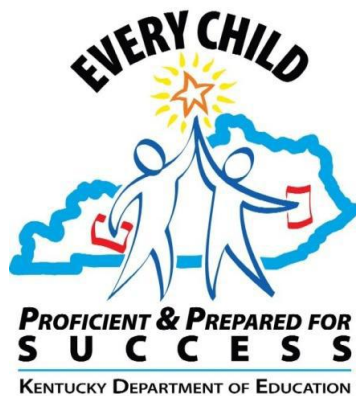# Fourth Grade – Mathematics

Kentucky Core Academic Standards with Targets

Grade Level: 4th Grade	
Standard with code	4.OA.1 Interpret a multiplication equation as a comparison, e.g. , interpret 35 = 5 x 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.
Domain:	Operation and Algebraic Thinking
Cluster:	Use the four operations with whole numbers to solve problems.
Type: ___ ___Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know multiplication strategies.	Interpret a multiplication equation as a comparison (e.g. 18 = 3 times as many as 6. Represent verbal statements of multiplicative comparisons as multiplication equations		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard with code:	**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.[1]** **[1] See Glossary, Table 2 in common core standards.**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Use the four operations with whole numbers to solve problems.**
Type: _____Knowledge ___X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply or divide to solve word problems. Describe multiplicative comparison. Describe additive comparison.	Determine appropriate operation and solve word problems involving multiplicative comparison. Determine and use a variety of representations to model a problem involving multiplicative comparison. Distinguish between multiplicative comparison and additive comparison (repeated addition).		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard with code:	**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.
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Use the four operations with whole numbers to solve problems.**
Type: _____Knowledge ___**X**___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Divide whole numbers including division with remainders.	Represent multi-step word problems using equations with a letter standing for the unknown quantity. Interpret multistep word problems (including problems in which remainders must be interpreted) and determine the appropriate operation(s) to solve. Assess the reasonableness of an answer in solving a multistep word problem using mental math and estimation strategies (including rounding).		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard with code:	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. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
Domain:	Operations and Algebraic Thinking
Cluster:	Gain familiarity with factors and multiples.
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define prime and composite numbers.

Know strategies to determine whether a whole number is prime or composite.

Identify all factor pairs for any given number 1-100.

Recognize that a whole number is a multiple of each of its factors. | Determine if a given whole number (1-100) is a multiple of a given one-digit number. | | |

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard with code:	**4.OA.5** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Generate and analyze patterns.**
Type:	**_____Knowledge ___X___Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify a number or shape pattern.	Generate a number or shape pattern that follows a given rule. Analyze a pattern to determine features not apparent in the rule (always odd or even, alternates between odd and even, etc.)		

Make sense of problems and persevere in solving them**.**	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others**.**	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	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 ÷ 70 = 10 by applying concepts of place value and division.*
Domain:	Number and Operations in Base Ten[2] [2]Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
Cluster:	Generalize place value understanding for multi-digit whole numbers.
Type:	___X___Knowledge _____Reasoning _____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
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.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	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.
Domain:	Number and Operations in Base Ten[2] [2]Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
Cluster:	Generalize place value understanding for multi-digit whole numbers.
Type: ____ __Knowledge __X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
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.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.
Domain:	Number and Operations in Base Ten[2] – [2]Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.
Cluster:	Generalize place value understanding for multi-digit whole numbers.
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Round multi-digit whole numbers to any place using place value.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard with code:	**4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.**
Domain:	**Number and operations in Base Ten**[2] [2]**Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.**
Cluster:	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**
Type:	**___X___Knowledge _____Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Fluently add and subtract multi-digit whole numbers less than or equal to 1,000,000 using the standard algorithm.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th grade	
Standard with code:	**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.**
Domain:	**Number and Operations in Base Ten[2]** **[2]Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.**
Cluster:	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**
Type: _____Knowledge ___X____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply a whole number of up to four digits by a one-digit whole number. Multiply two two-digit numbers.	Use strategies based on place value and the properties of operations to multiply whole numbers. Illustrate and explain calculations by using written equations, rectangular arrays, and/or area models.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	

Standard with code:	**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.**
Domain:	**Number and Operations in Base Ten[2]** **[2]Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.**
Cluster:	**Use place value understanding & properties of operations to perform multi-digit arithmetic.**
Type:	**_____Knowledge ___X___Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Find whole number quotients and remainders with up to four-digit dividends and one-digit divisors	Use the strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using written equations, rectangular arrays, and/or area models		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard:	4.NF.1 Explain why a fraction *a/b* is equivalent to a fraction (*n × a*)/(*n × 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.
Domain:	Number and Operations – Fractions[3] – [3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Cluster:	Extend understanding of fraction equivalence and ordering
Type: ___ ___Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize and identify equivalent fractions with unlike denominators	Explain why a/b is equal to (nxa)/(nxb) by using fraction models with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. (Ex: Use fraction strips to show why ½=2/4=3/6=4/8) Use visual fraction models to show why fractions are equivalent (ex: ¾ = 6/8) Generate equivalent fractions using visual fraction models and explain why they can be called "equivalent".		
Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard:	**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 ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols <, >, =, and justify the conclusion, e.g. by using a visual fraction model.**
Domain:	**Number and Operations – Fractions[3] – [3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Extend understanding of fraction equivalence and ordering**
Type:	**__ ___Knowledge __X___Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize fractions as being greater than, less than, or equal to other fractions. Record comparison results with symbols: **<, >, =** Use benchmark fractions such as ½ for comparison purposes. Make comparisons based on parts of the same whole.	Compare two fractions with different numerators, e.g. by comparing to a benchmark fraction such as ½. Compare two fractions with different denominators, e.g. by creating common denominators, or by comparing to a benchmark fraction such as ½. Justify the results of a comparison of two fractions, e.g. by using a visual fraction model.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard:	**4.NF.3a Understand a fraction a/b with a>1 as a sum of fractions 1/b.** **a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.**
Domain:	**Number and Operations – Fractions[3] [3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**
Type: __ ___Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Accumulating unit fractions (1/b) results in a fraction (a/b), where a is greater than 1. From the Introduction: Students extend previous understandings about how fractions are built from unit fractions, composing (joining) fractions from unit fractions, and decomposing (separating) fractions into unit fractions...	Using fraction models, reason that addition of fractions is joining parts that are referring to the same whole. Using fraction models, reason that subtraction of fractions is separating parts that are referring to the same whole.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course: 4th Grade	
Standard:	**4.NF.3b Understand a fraction** *a/b* **with** *a* **> 1 as a sum of fractions 1/***b***.** **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. 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.**
Domain:	**Number and Operations – Fractions³ ³Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**
Type: ___ Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Add and subtract fractions with like denominators. Recognize multiple representations of one whole using fractions with the same denominator.	Using visual fraction models, decompose a fraction into the sum of fractions with the same denominator in more than one way. Record decompositions of fractions as an equation and explain the equation using visual fraction models.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course : 4th Grade	
Standard with code:	**4.NF.3c Understand a fraction a/b with a >1 as a sum of fractions 1/b.** **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.**
Domain:	**Number and Operations – Fractions**[3] [3]**Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**
Type: _____Knowledge ___x___Reasoning _____Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Add and subtract mixed numbers with like denominators by using properties of operations and the relationship between addition and subtraction. Replace mixed numbers with equivalent fractions, using visual fraction models. Replace improper fractions with a mixed number, using visual fraction models.	Add and subtract mixed numbers by replacing each mixed number with an equivalent fraction.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course : 4th Grade	
Standard with code:	4.NF.3d Understand a fraction a/b with a >1 as a sum of fractions 1/b. 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.
Domain:	Number and Operations – Fractions[3] [3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Cluster:	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Type: ___ ___Knowledge ___X___Reasoning _____Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Add and subtract fractions with like denominators.	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, by using visual fraction models and equations to represent the problem.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course : 4th Grade	
Standard with code:	**4.NF.4a Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.** 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 x ¼, recording the conclusion by equation 5/4 = 5 x (1/4)**
Domain:	**Number and Operations – Fractions[3]** **[3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**
Type:	**__ ____Knowledge ___ X ___Reasoning _____Performance Skill __ ____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Represent a fraction a/b as a multiple of 1/b (unit fractions). For example, represent 5/4 as an accumulation of five ¼'s. From the Introduction: Students extend previous understandings about how fractions are built from unit fractions, using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.	Apply multiplication of whole numbers to multiplication of a fraction by a whole number using visual fraction models. (For example, just as students know that four 3's can be represented by 4x3, students know that five 1/4's is 5 x 1/4 which is 5/4.)		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course : 4th Grade	
Standard with code:	4.NF.4b Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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 x (2/5) as 6 x (1/5) recognizing this product as (6/5).
Domain:	Number and Operations – Fractions³ ³Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Cluster:	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Type: _____Knowledge ____x__Reasoning _____Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
From the Introduction: Extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply by a whole number.	Explain that a multiple of a/b is a multiple of 1/b (unit fraction) using a visual fraction model. Multiply a fraction by a whole number by using the idea that a/b is a multiple of 1/b. For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5) recognizing this product as (6/5).		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course : 4th Grade	
Standard with code:	4.NF.4c Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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.
Domain:	Number and Operations – Fractions³ ³Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Cluster:	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Type: _____Knowledge ____X__Reasoning _____Performance Skill __ ____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply a fraction by a whole number. Use fraction models and equations to represent the problem.	Solve word problems involving multiplication of a fraction by a whole number.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**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.**[4] *For example, express 3/10 as 30/100 and add 3/10 + 4/100 = 34/100.* [4]**Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.**
Domain:	**Number and Operations – Fractions**[3] [3]**Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Understand decimal notation for fractions, and compare decimal fractions.**
Type:	**_____Knowledge ___X___Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Rename and recognize a fraction with a denominator of 10 as a fraction with a denominator of 100. Recognize that two fractions with unlike denominators can be equivalent.	Use knowledge of renaming tenths to hundredths to add two fractions with denominators 10 and 100.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	4.NF.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*
Domain:	Number and Operations – Fractions[3] [3]Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Cluster:	Understand decimal notation for fractions, and compare decimal fractions.
Type:	_____Knowledge ___X___Reasoning _____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Explain the values of digits in the decimal places. Read and write decimals through hundredths. Rename fractions with 10 and 100 in the denominator as decimals. Recognize multiple representations of fractions with denominators 10 or 100.	Represent fractions with denominators 10 or 100 with multiple representations and decimal notation. Explain how decimals and fractions relate.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**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.**
Domain:	**Number and Operations – Fractions3** **3Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
Cluster:	**Understand decimal notation for fractions, and compare decimal fractions.**
Type:	**_____Knowledge ___X___Reasoning _____Performance Skill _____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that comparisons are valid only when the two decimals refer to the same whole.	Compare two decimals to hundredths by reasoning about their size. Record the results of comparisons with the symbols >, =, or <. Justify the conclusions using visual models and other methods.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/Course (high School): 4th Grade	
Standard with Code:	**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 2-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), …*
Domain:	**Measurement and Data**
Cluster:	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**
Type: _____Knowledge __X ___Reasoning ____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Know relative size of measurement units (km, m; kg, g; lb, oz; L, mL; hrs, min, sec)	Compare the different units within the same system of measurement (e.g. 1 ft = 12 in; 1 lb = 16 oz) Convert larger units of measurement within the same system to smaller units and record conversions in a 2-column table.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/Course (high School): 4th Grade	
Standard with Code:	**4.MD.2 Use 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.**
Domain:	**Measurement and Data**
Cluster:	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**

Type: _____Knowledge __X___Reasoning ____Performance Skill __ __Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Add, subtract, multiply, and divide fractions and decimals.

Express measurements given in a larger unit in terms of a smaller unit. | Solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money.

Solve word problems involving measurement that include simple fractions or decimals.

Solve word 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. | | |

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/Course (high School): 4th Grade	
Standard with Code:	**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.*
Domain:	**Measurement and Data**
Cluster:	**Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**
Type: _____Knowledge __ X ___Reasoning ___ __Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Know that the formula for the perimeter of a rectangle is 2L + 2W or L+L+W+W. Know that the formula for the area of a rectangle is L x W.	Apply the formula for perimeter of a rectangle to solve real world and mathematical problems. Apply the formula for area of a rectangle to solve real world and mathematical problems. Solve area and perimeter problems in which there is an unknown factor (n).		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, ¼, 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.*
Domain:	**Measurement and Data**
Cluster:	**Represent and interpret data.**
Type:	**_____Knowledge _____Reasoning _____Performance Skill __X____Product**

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Add and subtract fractions.	Analyze and interpret a line plot to solve problems involving addition and subtraction of fractions.		Create a line plot to display a data set of measurements given in fractions of a unit.

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade

Standard with code:	4.MD.5ab Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.
Domain:	Measurement and Data
Cluster:	Geometric measurement: understand concepts of angle and measure angles.
Type: _____Knowledge   ___X___Reasoning   _____Performance Skill   _____Product

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define angle. Recognize a circle as a geometric figure that has 360 degrees. Recognize and identify an angle as a geometric shape formed from 2 rays with a common endpoint. Recognize that an angle is a fraction of a 360 degree circle. Explain the angle measurement in terms of degrees.	Compare angles to circles with the angles point at the center of the circle to determine the measure of the angle. Calculate angle measurement using the 360 degrees of a circle.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
Domain:	Measurement and Data
Cluster:	Geometric Measurement: understand concepts of angle and measure angles.
Type: _____Knowledge _____Reasoning ___X___Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that angles are measured in degrees (°). Read a protractor.	Determine which scale on the protractor to use, based on the direction the angle is open. Determine the kind of angle based on the specified measure to decide reasonableness of the sketch.	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**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.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of angle and measure angles.**

Type: _____Knowledge   ___X___Reasoning   _____Performance Skill   _____Product

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize that an angle can be divided into smaller angles	Solve addition and subtraction equations to find unknown angle measurements on a diagram. Find an angle measure by adding the measurements of the smaller angles that make up the larger angle. Find an angle measure by subtracting the measurements of the smaller angle from the larger angle.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade

Standard with code:	4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
Domain:	Geometry
Cluster:	Draw and identify lines and angles ,and classify shapes by properties of their lines and angles.
Type: _____Knowledge __X___Reasoning _____Performance Skill __ __Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines.	Analyze two-dimensional figures to identify points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines.		

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**4.G.2 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. Recognize right triangles as a category, and identify right triangles.**
Domain:	**Geometry**
Cluster:	**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**
Type: _____Knowledge __X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify parallel or perpendicular lines in two dimensional figures.

Recognize acute, obtuse, and right angles.

Identify right triangles. | Classify two-dimensional figures based on parallel or perpendicular lines and size of angles.

Classify triangles as right triangles or not right. | | |

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

Grade Level/ Course (HS): 4th Grade	
Standard with code:	**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.
Domain:	**Geometry**
Cluster:	**Draw and identify lines and angles, and classify shapes by properties of their lines and angles.**
Type: __X__Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize lines of symmetry for a two-dimensional figure. Recognize a line of symmetry as a line across a figure that when folded along creates matching parts. Draw lines of symmetry for two-dimensional figures. Identify line-symmetric figures.			

Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with mathematics.	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.