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Simple Solutions Standards Mapping

Kentucky Academic Standards for Mathematics

Grades K - 8

Table of Contents

Introduction

The purpose of this document is to demonstrate how *Simple Solutions Mathematics* aligns with the Kentucky Academic Standards for Mathematics. Each grade document aligns the standards from the *Simple Solutions Mathematics* series to the standards approved by the Kentucky Department of Education, and highlights the standards and eligible content identified within the Kentucky Academic Standards for Mathematics.

Simple Solutions Website:
https://simplesolutions.org/

Common Core Standards Website:
http://www.corestandards.org/Math/

Kentucky Department of Education:
https://education.ky.gov/curriculum/standards/kyacadstand/Pages/contentareasstandards.aspx

Level K - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Counting and Cardinality (CC)				
KY.K.CC.1	Count *a. Count to 100 by ones and by tens.* *b. Count backwards from 30 by ones. (Available in SS Level 1, 1. NBT.1)*	**MP.7** **MP.8**	**K.CC.1**	Count to 100 by ones and by tens.
KY.K.CC.2	Count forward beginning from a given number within the known sequence within 100 (instead of having to begin at 1).	**MP.7**	**K.CC.2**	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
KY.K.CC.3	Represent numbers. *a. Write numbers from 0 to 20.* *b. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).*	**MP.2** **MP.7** **MP.8**	**K.CC.3**	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
KY.K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality. *a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.* *b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.* *c. Understand that each successive number name refers to a quantity that is one larger.*	**MP.2** **MP.8**	**K.CC.4**	Understand the relationship between numbers and quantities; connect counting to cardinality.
KY.K.CC.5	Given a number from 1-20, count out that many objects. a. Count to answer "how many?" questions with as many as 20 things arranged in a line, a rectangular array, or a circle. b. Count to answer "how many?" questions with as many as 10 things in a scattered configuration.	**MP.2** **MP.3**	**K.CC.5**	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.
KY.K.CC.6	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group.	**MP.1** **MP.3** **MP.6**	**K.CC.6**	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
KY.K.CC.7	Compare two numbers between 1 and 10 presented as written numerals.	**MP.2**	**K.CC.7**	Compare two numbers between 1 and 10 presented as written numerals.

Level K - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.K.NBT.1	Compose and decompose numbers from 11 to 19 using quantities (numbers with units) of ten ones and some further ones. Understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	**MP.3** **MP.4** **MP.7**	**K.NBT.1**	Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
Operations and Algebraic Thinking (OA)				
KY.K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations.	**MP.2** **MP.4**	**K.OA.1**	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
KY.K.OA.2	Solve addition and subtraction word problems and add and subtract within 10 by using objects or drawings to represent the problem.	**MP.5**	**K.OA.2**	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
KY.K.OA.3	Decompose numbers less than or equal to 10. *a. Decompose numbers into two groups in more than one way by using objects or drawings and record each decomposition by a drawing or equation.* *b. Use objects or drawings to demonstrate equality as the balancing of quantities.*	**MP.2** **MP.4**	**K.OA.3**	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation. (e.g., 5 = 2 + 3 and 5 = 4 + 1).
KY.K.OA.4	For any number from 1 to 9, find the number that makes 10 when added to the given number by using objects or drawings and record the answer with a drawing or equation.	**MP.7** **MP.8**	**K.OA.4**	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
KY.K.OA.5	Fluently add and subtract within 5.	**MP.2** **MP.7**	**K.OA.5**	Fluently add and subtract within 5.

Level K - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.K.G.1	Name and describe shapes in the environment. *a. Describe objects in the environment using names of shapes.* *b. Describe the relative positions of these objects using terms above, below, in front of, behind and next to.*	**MP.6**	**K.G.1**	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
KY.K.G.2	Correctly name shapes regardless of orientations or overall size.	**MP.7**	**K.G.2**	Correctly name shapes regardless of their orientations or overall size.
KY.K.G.3	Identify shapes as two-dimensional or three-dimensional.	**MP.3** **MP.6**	**K.G.3**	Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
KY.K.G.4	Describe the similarities, differences and attributes of two and three dimensional shapes using different sizes and orientations.	**MP.3** **MP.7**	**K.G.4**	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
KY.K.G.5	Model shapes in the world by building figures from components and drawing shapes.	**MP.1** **MP.5**	**K.G.5**	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
KY.K.G.6	Compose simple shapes to form larger shapes.	**MP.3** **MP.5**	**K.G.6**	Compose simple shapes to form larger shapes.
		Measurement and Data (MD)		
KY.K.MD.1	Describe measurable attributes (length, height, weight, width, depth) of an object or a set of objects using appropriate vocabulary.	**MP.3** **MP.6**	**K.MD.1**	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
KY.K.MD.2	Directly compare two objects with a measurable attribute in common, to see which object has “more of”/ “less of” the attribute and describe the difference.	**MP.2** **MP.6**	**K.MD.2**	Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.
KY.K.MD.3	Classify and sort objects or people by attributes. Limit objects or people in each category to be less than or equal to 10.	**MP.3** **MP.6**	**K.MD.3**	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
KY.K.MD.4	Recognize and identify coins by name (penny, nickel, dime, quarter).	**MP.6**	**2.MD.8 (Appears in Level 1 as "Prep"**	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

Level 1 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.1.NBT.1	Count and represent numbers. *a. Count forward to and backward from 120, starting at any number less than 120.* *b. In this range, read and write numerals and represent a number of objects with a written numeral.*	**MP.2** **MP.5** **MP.8**	**1.NBT.1**	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
KY.1.NBT.2	Understand the two-digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: *a. 10 can be thought of as a bundle of ten ones — called a "ten."* *b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight or nine ones.* *c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight or nine tens (and 0 ones).*	**MP.5** **MP.7**	**1.NBT.2**	Understand that the two digits of a two-digit number represent amounts of tens and ones.
KY.1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	**MP.2**	**1.NBT.3**	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
KY.1.NBT.4	Add within 100 including adding a two-digit number and a one-digit number. Add a two-digit number and a multiple of 10. *a. Add within 100 using…* *• concrete models or drawings;* *• strategies based on place value;* *• properties of operations;* *• the relationship between addition and subtraction.* *b. Relate the addition strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.*	**MP.7** **MP.2** **MP.3**	**1.NBT.4**	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
KY.1.NBT.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	**MP.2** **MP.8**	**1.NBT.5**	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
KY.1.NBT.6	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences). *a. Subtract using:* *• concrete models or drawings;* *• strategies based on place value;* *• properties of operations;* *• the relationship between addition and subtraction* *b. Relate the subtraction strategy to a written method and explain the reasoning used.*	**MP.3** **MP.5**	**1.NBT.6**	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Level 1 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Operations and Algebraic Thinking (OA)				
KY.1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions.	**MP.1** **MP.2**	**1.OA.1**	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
KY.1.OA.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, by using objects, drawings and equations with a symbol for one unknown number to represent the problem.	**MP.1** **MP.4** **MP.5**	**1.OA.2**	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
KY.1.OA.3	Apply properties of operations as strategies to add and subtract.	**MP.2** **MP.7**	**1.OA.3**	Apply properties of operations as strategies to add and subtract.
KY.1.OA.4	Understand subtraction as an unknown-addend problem.	**MP.2** **MP.7**	**1.OA.4**	Understand subtraction as an unknown-addend problem.
KY.1.OA.5	Relate counting to addition and subtraction.	**MP.5** **MP.8**	**1.OA.5**	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
KY.1.OA.6	Add and subtract within 20. *a. Fluently add and subtract within 10.* *b. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making 10; decomposing a number leading to a 10; using the relationship between addition and subtraction; creating equivalent but easier or known sums.*	**MP.2** **MP.7** **MP.8**	**1.OA.6**	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).
KY.1.OA.7	Understand the meaning of the equal sign and determine if equations involving addition and subtraction are true or false.	**MP.2** **MP.3**	**1.OA.7**	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.
KY.1.OA.8	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.	**MP.1** **MP.2**	**1.OA.8**	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.

Level 1 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.1.G.1	Distinguish between defining attributes versus non-defining attributes; build and draw shapes to possess defining attributes.	**MP.7**	**1.G.1**	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
KY.1.G.2	Compose shapes. *a. Compose two-dimensional shapes to create rectangles, squares, trapezoids, triangles, half-circles and quarter-circles composite shape and compose new shapes from the composite shapes.* *b. Use three-dimensional shapes (cubes, right rectangular prisms, right circular cones and right circular cylinders) to create a composite shape and compose new shapes from the composite shapes.*	**MP.1** **MP.4**	**1.G.2**	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
KY.1.G.3	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths and quarters, and use the phrases half of, fourth of and quarter of. Describe the whole as two of or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	**MP.3** **MP.6**	**1.G.3**	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
		Measurement and Data (MD)		
KY.1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.	**MP.6**	**1.MD.1**	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
KY.1.MD.2	Express the length of an object as a whole number of same-size length units, by laying multiple copies of a shorter object (the length unit) end to end with no gaps or overlaps.	**MP.2** **MP.5** **MP.8**	**1.MD.2**	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
KY.1.MD.3	Assign values to time and money. *a. Tell and write time in hours and half-hours using analog and digital clocks.* *b. Identify the coins by values (penny, nickel, dime, quarter).*	**MP.6** **MP.8**	**1.MD.3**	Tell and write time in hours and half-hours using analog and digital clocks.
			2.MD.8 (Appears in Level 1 as "Prep"	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.
KY.1.MD.4	Investigate questions involving categorical data. *a. Pose a question that can be answered by gathering data.* *b. Determine strategy for gathering data from peers.* *c. Organize and represent data in a table/chart with up to three categories.* *d. Interpret data to answer questions about the table/chart that connects to the question posed, including total number of data points, how many in each category and how many more or less are in one category than in another.*	**MP.1** **MP.3** **MP.4** **MP.6**	**1.MD.4**	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Level 2 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens and ones. Understand the following as special cases: *a. 100 can be thought of as a bundle of ten tens — called a "hundred."* *b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).*	**MP.2** **MP.7**	**2.NBT.1**	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
KY.2.NBT.2	Count forwards and backwards within 1000; skip-count by 5s, 10s and 100s.	**MP.8** **MP. 1** **MP. 6**	**2.NBT.2**	Count within 1000; skip-count by 5s, 10s, and 100s.
KY.2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names and expanded form.	**MP.7**	**2.NBT.3**	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
KY.2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens and ones digits, using >, =, and < symbols to record the results of comparisons.	**MP.2** **MP.6**	**2.NBT.4**	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
KY.2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.	**MP.2** **MP.8**	**2.NBT.5**	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
KY.2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.	**MP.2** **MP.7**	**2.NBT.6**	Add up to four two-digit numbers using strategies based on place value and properties of operations.
KY.2.NBT.7	Add and subtract within 1000. a. Represent and solve addition and subtraction problems using… • concrete models or drawings; • strategies based on place value; • properties of operations; • the relationship between addition and subtraction and; • relate drawings and strategies to expressions or equations. b. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	**MP.1** **MP.5**	**2.NBT.7**	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
KY.2.NBT.8	Mentally add 10 or 100 to a given number 100–900 and mentally subtract 10 or 100 from a given number 100–900.	**MP.7** **MP.8**	**2.NBT.8**	Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
KY.2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.		**2.NBT.9**	Explain why addition and subtraction strategies work, using place value and the properties of operations.

Level 2 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Operations and Algebraic Thinking (OA)				
KY.2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, by using drawings and equations with a symbol for the unknown number to represent the problem.	**MP.1 MP.2 MP.4**	**2.OA.1**	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
KY.2.OA.2	Fluently add and subtract within 20 using mental strategies.	**MP.2 MP.7 MP.8**	**2.OA.2**	Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.
KY.2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members; write an equation to express an even number as a sum of two equal addends.	**MP.2 MP.7**	**2.OA.3**	Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
KY.2.OA.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	**MP.2 MP.4**	**2.OA.4**	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
Geometry (G)				
KY.2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or sides. Identify triangles, quadrilaterals, pentagons, hexagons and cubes (identify number of faces).	**MP.4 MP.7**	**2.G.1**	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.1 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
KY.2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	**MP.6 MP.8**	**2.G.2**	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
KY.2.G.3	Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, half of, a third of, etc.; and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	**MP.2 MP.3**	**2.G.3**	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

Level 2 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Measurement and Data (MD)				
KY.2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes.	**MP.5 MP.6**	**2.MD.1**	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
KY.2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	**MP.3 MP.5**	**2.MD.2**	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
KY.2.MD.3	Estimate lengths using units of inches, feet, yards, centimeters and meters.	**MP.2 MP.6**	**2.MD.3**	Estimate lengths using units of inches, feet, centimeters, and meters.
KY.2.MD.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of either a customary or metric standard length unit.	**MP.5 MP.6**	**2.MD.4**	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
KY.2.MD.5	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units by using drawings and equations with a symbol for the unknown number to represent the problem.	**MP.1 MP.4**	**2.MD.5**	Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
KY.2.MD.6	Represent whole numbers as lengths from 0 on a number line with equally spaced points corresponding to the numbers 0, 1, 2, ... and represent whole-number sums and differences within 100 on a number line.	**MP.3 MP.4**	**2.MD.6**	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.
KY.2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	**MP.5 MP.6**	**2.MD.7**	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
KY.2.MD.8	Solve word problems with adding and subtracting within 100, (not using dollars and cents simultaneously) using the $ and ¢ symbols appropriately (not including decimal notation).	**MP.1 MP.5**	**2.MD.8**	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
KY.2.MD.9	Investigate questions involving measurements. *a. Identify a statistical question focused on measurements.* *b. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object.* *c. Show the measurements by making a dot plot, where the horizontal scale is marked off in whole-number units .*	**MP.1 MP.6**	**2.MD.9**	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
KY.2.MD.10	Create a pictograph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart and compare problems using information presented in a bar graph.	**MP.2 MP.6**	**2.MD.10**	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Level 3 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	**MP.7**	**3.NBT.1**	Use place value understanding to round whole numbers to the nearest 10 or 100.
KY.3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations and/or the relationship between addition and subtraction.	**MP.2** **MP.3**	**3.NBT.2**	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
KY.3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range of 10–90 using strategies based on place value and properties of operations.	**MP.7** **MP.8**	**3.NBT.3**	Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.
Number and Operations - Fractions (NF)				
KY.3.NF.1	Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.	**MP.2** **MP.7**	**3.NF.1**	Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
KY.3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line *a. Represent a fraction 1/b (unit fraction) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts.* *• Recognize each part has size 1/b.* *• a unit fraction, 1/b is located 1/b of a whole unit from 0 on the number line.* *b. Represent a non-unit fraction a/b on a number line by marking off lengths of 1/b (unit fractions) from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the non-unit fraction a/b on the number line.*	**MP.4**	**3.NF.2**	Understand a fraction as a number on the number line; represent fractions on a number line diagram.
KY.3.NF.3	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. *a. Understand two fractions as equivalent (equal) if they are the same size, or same point on a number line.* *b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent through writing or drawing.* *c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.* *d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.*	**MP.2** **MP.3**	**3.NF.3**	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

Level 3 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Operations and Algebraic Thinking (OA)				
KY.3.OA.1	Interpret and demonstrate products of whole numbers.	**MP.2 MP.5**	**3.OA.1**	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.
KY.3.OA.2	Interpret and demonstrate whole-number quotients of whole numbers, where objects are partitioned into equal shares.	**MP.2 MP.5**	**3.OA.2**	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
KY.3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities, by using drawings and equations with a symbol for the unknown number to represent the problem.	**MP.1 MP.4**	**3.OA.3**	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
KY.3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.	**MP.6 MP.7**	**3.OA.4**	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
KY.3.OA.5	Apply properties of operations as strategies to multiply and divide.	**MP.3 MP.4**	**3.OA.5**	Apply properties of operations as strategies to multiply and divide.
KY.3.OA.6	Understand division as an unknown-factor problem.	**MP.2**	**3.OA.6**	Understand division as an unknown-factor problem.
KY.3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.	**MP.2 MP.8**	**3.OA.7**	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
KY.3.OA.8	Use various strategies to solve two-step word problems using the four operations (involving only whole numbers with whole number answers). 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.	**MP.1 MP.4**	**3.OA.8**	Solve two-step word problems using the four operations. 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.
KY.3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.	**MP.3 MP.8**	**3.OA.9**	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Level 3 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.3.G.1	Classify polygons by attributes. *a. Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons and hexagons).* *b. Recognize and classify quadrilaterals (rectangles, squares, parallelograms, rhombuses, trapezoids) by side lengths and understanding shapes in different categories may share attributes and the shared attributes can define a larger category.* *c. Identify shapes that do not belong to a given category or subcategory.*	**MP.6** **MP.7**	**3.G.1**	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
KY.3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.	**MP.2** **MP.5**	**3.G.2**	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

Level 3 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Measurement and Data (MD)				
KY.3.MD.1	Tell and write time to the nearest minute and measure elapsed time intervals in minutes. Solve word problems involving addition and subtraction of time intervals within and across the hour in minutes.	**MP.1 MP.4 MP.6**	**3.MD.1**	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
KY.3.MD.2	Measure and solve problems involving mass and liquid volume. *a. Measure and estimate masses and liquid volumes of objects using standard units of grams (g), kilograms (kg) and liters (L).* *b. Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.*	**MP.1 MP.6**	**3.MD.2**	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
KY.3.MD.3	Investigate questions involving categorical data. *a. Identify a statistical question focused on categorical data and gather data;* *b. Create a scaled pictograph and a scaled bar graph to represent a data set (using technology or by hand);* *c. Make observations from the graph about the question posed, including "how many more" and "how many less" questions.*	**MP.3 MP.5 MP.6**	**3.MD.3**	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
KY.3.MD.4	Investigate questions involving numerical data. *a. Identify a statistical question focused on numerical data;* *b. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.* *c. Show the data by making a dot plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.* *d. Make observations from the graph about the question posed, including questions about the shape of the data and compare responses.*	**MP.1 MP.3 MP.6**	**3.MD.4**	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
KY.3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.	**MP.5**	**3.MD.5**	Recognize area as an attribute of plane figures and understand concepts of area measurement.
KY.3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft. and improvised units).	**MP.5 MP.6**	**3.MD.6**	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Level 3 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
KY.3.MD.7	Relate area to the operations of multiplication and addition. *a. Find the area of a rectangle with whole-number side lengths by tiling it and show the area is the same as would be found by multiplying the side lengths.* *b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.* *c. Use tiling to show in a concrete case the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.* *d. Recognize area as additive. Find areas of figures that can be decomposed into non-overlapping rectangles by adding the areas of the non-overlapping parts, applying this technique to solve real world problems.*	**MP.1** **MP.8**	**3.MD.7**	Relate area to the operations of multiplication and addition.
KY.3.MD.8	Solve real world and mathematical problems involving perimeters of polygons. *a. Find the perimeter given the side lengths of a polygon.* *b. Find an unknown side length, given the perimeter and some lengths.* *c. Draw rectangles with the same perimeter and different areas or with the same area and different perimeters.*	**MP.1** **MP.4**	**3.MD.8**	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Level 4 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.4.NBT.1	Recognize in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	**MP.7**	**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.
KY.4.NBT.2	Represent and compare multi-digit whole numbers. *a. Read and write multi-digit whole numbers using base-ten numerals, number names and expanded form.* *b. Compare two multi-digit numbers based on meanings of the digit in each place, using >, =, and < symbols to record the results of comparisons.*	**MP.2** **MP.7**	**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.
KY.4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	**MP.2** **MP.6**	**4.NBT.3**	Use place value understanding to round multi-digit whole numbers to any place.
KY.4.NBT.4	Fluently add and subtract multi-digit whole numbers using an algorithm.	**MP.2** **MP.8**	**4.NBT.4**	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
KY.4.NBT.5	Multiply whole numbers ● *Up to four digit number by a one-digit number* ● *Two-digit number by two-digit number* *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.*	**MP.3** **MP.4** **MP.8**	**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.
KY.4.NBT.6	Divide up to four-digit dividends by one-digit divisors. Find whole number quotients and remainders using ● *strategies based on place value* ● *the properties of operations* ● *the relationship between multiplication and division* *Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.*	**MP.3** **MP.7** **MP.8**	**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.

Level 4 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations Fractions (NF)				
KY.4.NF.1	Understand and generate equivalent fractions. *a. Use visual fraction models to recognize and generate equivalent fractions that have different numerators/denominators even though they are the same size.* *b. Explain why a fraction a/b is equivalent to a fraction(nxa)/(nxb).*	**MP.4** **MP.7** **MP.8**	**4.NF.1**	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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.
KY.4.NF.2	Compare two fractions with different numerators and different denominators using the symbols <, =, or >. Recognize comparisons are valid only when the two fractions refer to the same whole. Justify the conclusions.	**MP.2** **MP.3**	**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.
KY.4.NF.3	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.* *b. Decomposing a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions.* *c. Add and subtract mixed numbers with like denominators.* *d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.*	**MP.1** **MP.5** **MP.7**	**4.NF.3**	Understand a fraction a/b with a > 1 as a sum of fractions $1/b$.
KY.4.NF.4	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.* *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.* *c. Solve word problems involving multiplication of a fraction by a whole number.*	**MP.5** **MP.8**	**4.NF.4**	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
KY.4.NF.5	Convert and add fractions with denominators of 10 and 100. *a. Convert a fraction with a denominator of 10 to an equivalent fraction with a denominator of 100.* *b. Add two fractions with respective denominators 10 and 100.*	**MP.5** **MP.7**	**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.
KY.4.NF.6	Use decimal notation for fractions with denominators 10 or 100.	**MP.4** **MP.7**	**4.NF.6**	Use decimal notation for fractions with denominators 10 or 100.
KY.4.NF.7	Compare two decimals to hundredths. *a. Compare two decimals to hundredths by reasoning about their size.* *b. Recognize that comparisons are valid only when the two decimals refer to the same whole.* *c. Record the results of comparisons with the symbols >, =, or < and justify the conclusions.*	**MP.2** **MP.3** **MP.5**	**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.

Level 4 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Operations and Algebraic Thinking (OA)		
KY.4.OA.1	Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.	**MP.2 MP.4**	**4.OA.1**	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 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.
KY.4.OA.2	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.	**MP.1 MP.2 MP.3**	**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.
KY.4.OA.3	Solve multistep problems. *a. Perform operations in the conventional order when there are no parentheses to specify a particular order.* *b. 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.*	**MP.1 MP.4**	**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.
KY.4.OA.4	Find factors and multiples of numbers in the range 1-100. *a. Find all factor pairs for a given whole number.* *b. Recognize that a whole number is a multiple of each of its factors.* *c. Determine whether a given whole number is a multiple of a given one-digit number.* *d. Determine whether a given whole number is prime or composite.*	**MP.5 MP.7**	**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.
KY.4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern not explicit in the rule itself.	**MP.2 MP.3**	**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.
		Geometry (G)		
KY.4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.	**MP.5 MP.6**	**2.G.1**	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
KY.4.G.2	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.	**MP.7**	**2.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.
KY.4.G.3	Identify lines of symmetry. *a. Recognize a line of symmetry for a two-dimensional figure.* *b. Identify line-symmetric figures and draw lines of symmetry.*	**MP.5 MP.7**	**2.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.

Level 4 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Measurement and Data (MD)				
KY.4.MD.1	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). *a. Understand the relationship of measurement units within any given measurement system.* *b. Within any given measurement system, express measurements in a larger unit in terms of a smaller unit.* *c. Record measurement equivalents in a two-column table.*	***MP.5*** ***MP.6***	**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.
KY.4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money. *a. Solve measurement problems involving whole number, simple fractions or decimals.* *b. 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.* *c. Visually display measurement quantities using representations such as number lines that feature a measurement scale.*	***MP.1*** ***MP.4***	**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.
KY.4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	***MP.1*** ***MP.3***	**4.MD.3**	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
KY.4.MD.4	Use dot plots to analyze data to a statistical question. *a. Identify a statistical question focused on numerical data.* *b. Make a dot plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).* *c. Solve problems involving addition and subtraction of fractions by using information presented in dot plots.*	***MP.1*** ***MP.6***	**4.MD.4**	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
KY.4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint and understand concepts of angle measurement.	***MP.7***	**4.MD.5**	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
KY.4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	***MP.5*** ***MP.6***	**4.MD.6**	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
KY.4.MD.7	Recognize angle measure as additive. When an angle is 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.	***MP.1*** ***MP.4***	**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.

Level 5 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations in Base Ten (NBT)				
KY.5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	**MP.2** **MP.7**	**5.NBT.1**	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
KY.5.NBT.2	Multiply and divide by powers of 10. • *Explain patterns in the number of zeros of the product when multiplying a number by powers of 10.* • *Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.* • *Use whole-number exponents to denote powers of 10.*	**MP.3** **MP.8**	**5.NBT.2**	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
KY.5.NBT.3	Read, write and compare decimals to thousandths. *a. Read and write decimals to thousandths using base-ten numerals, number names and expanded form.* *b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.*	**MP.2** **MP.5** **MP.7**	**5.NBT.3**	Read, write, and compare decimals to thousandths.
KY.5.NBT.4	Use place value understanding to round decimals to any place.	**MP.5** **MP.7**	**5.NBT.4**	Use place value understanding to round decimals to any place.
KY.5.NBT.5	Fluently multiply multi-digit whole numbers (not to exceed four-digit by two-digit multiplication) using an algorithm.	**MP.7** **MP.8**	**5.NBT.5**	Fluently multiply multi-digit whole numbers using the standard algorithm.
KY.5.NBT.6	Divide up to four-digit dividends by two-digit divisors. *a. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using…* • *strategies based on place value* • *the properties of operations* • *the relationship between multiplication and division* *b. Illustrate and explain the calculation by using equations, rectangular arrays and/or area models.*	**MP.2** **MP.3** **MP.4**	**5.NBT.6**	Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
KY.5.NBT.7	Operations with decimals to hundredths. *a. Add, subtract, multiply and divide decimals to hundredths using…* • *concrete models or drawings* • *strategies based on place value* • *properties of operations* • *the relationship between addition and subtraction* *b. Relate the strategy to a written method and explain the reasoning used.*	**MP.2** **MP.3** **MP.5**	**5.NBT.7**	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Level 5 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Number and Operations Fractions (NF)				
KY.5.NF.1	Efficiently add and subtract fractions with unlike denominators (including mixed numbers) by… • *using reasoning strategies, such as counting up on a number line or creating visual fraction models* • *finding common denominators*	**MP.2** **MP.3**	**5.NF.1**	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
KY.5.NF.2	Solve word problems involving addition and subtraction of fractions. *a. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.* *b. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.*	**MP.1** **MP.4**	**5.NF.2**	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
KY.5.NF.3	Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers by using visual fraction models or equations to represent the problem.	**MP.4** **MP.8**	**5.NF.3**	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
KY.5.NF.4	Apply and extend previous understanding of multiplication to multiply a fraction or whole number by a fraction. *a. Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b.* *b. Find the area of a rectangle with fractional side lengths by tiling it with squares of the appropriate unit fraction side lengths and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles and represent fraction products as rectangular areas.*	**MP.1**	**5.NF.4**	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
KY.5.NF.5	Interpret multiplication as scaling (resizing), by: *a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.* *b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (nxa)/(nxb) to the effect of multiplying a/b by 1.*	**MP.2** **MP.6**	**5.NF.5**	Interpret multiplication as scaling (resizing).
KY.5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers.	**MP.4** **MP.5**	**5.NF.6**	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
KY.5.NF.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *a. Interpret division of a unit fraction by a non-zero whole number and compute such quotients.* *b. Interpret division of a whole number by a unit fraction and compute such quotients.* *c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.*	**MP.1** **MP.4** **MP.8**	**5.NF.7**	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

Level 5 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Operations and Algebraic Thinking (OA)				
KY.5.OA.1	Use parentheses, brackets or braces in numerical expressions and evaluate expressions that include symbols.	**MP.1** **MP.3**	**5.OA.1**	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
KY.5.OA.2	Write simple expressions with numbers and interpret numerical expressions without evaluating them.	**MP.2** **MP.7**	**5.OA.2**	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
KY.5.OA.3	Generate numerical patterns for situations. *a. Generate a rule for growing patterns, identifying the relationship between corresponding terms (x, y).* *b. Generate patterns using one or two given rules (x, y).* *c. Use tables, ordered pairs and graphs to represent the relationship between the quantities.*	**MP.2** **MP.4**	**5.OA.3**	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
Geometry (G)				
KY.5.G.1	Use a pair perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis and the second number indicates how far to travel in the direction of the second.	**MP.4** **MP.7**	**5.G.1**	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x* -axis and *x* -coordinate, *y* -axis and *y* -coordinate).
KY.5.G.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.	**MP.1** **MP.6**	**5.G.2**	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
KY.5.G.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.	**MP.3** **MP.6**	**5.G.3**	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
KY.5.G.4	Classify two-dimensional figures in a hierarchy based on properties.	**MP.1** **MP.7**	**5.G.4**	Classify two-dimensional figures in a hierarchy based on properties.

Level 5 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Measurement and Data (MD)				
KY.5.MD.1	Convert among different size measurement units (mass, weight, liquid volume, length, time) within one system of units (metric system, U.S. standard system and time).	**MP.3** **MP.8**	**5.MD.1**	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
KY.5.MD.2	Identify and gather data for statistical questions focused on both categorical and numerical data. Select an appropriate data display (bar graph, pictograph, dot plot). Make observations from the graph about the questions posed.	**MP.4** **MP.5** **MP.6**	**5.MD.2**	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.
KY.5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. *a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume and can be used to measure volume.* *b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.*	**MP.6**	**5.MD.3**	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
KY.5.MD.4	Measure volumes by counting unit cubic cm, cubic in, cubic ft. and improvised units.	**MP.5** **MP.6**	**5.MD.5**	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
KY.5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. *a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes.* *b. Apply the formulas V= l x w x h and V = B x h for rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.* *c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.*	**MP.1** **MP.4** **MP.8**	**5.MD.4**	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Level 6 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Ratios & Proportional Relationships (RP)		
KY.6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.	**MP.2 MP.6**	**6.RP.1**	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
KY.6.RP.2	Understand the concept of a unit rate a/b associated with a ratio a:b with B ≠ 0 and use rate language in the context of a ratio relationship.	**MP.2 MP.6**	**6.RP.2**	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.
KY.6.RP.3	Use ratio and rate reasoning to solve real-world and mathematical problems. *a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables and plot the pairs of values on the coordinate plane. Use tables to compare ratios.* *b. Solve rate problems including those involving unit pricing and constant speed.* *c. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.*	**MP.1 MP.4 MP.7**	**6.RP.3**	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
		The Number System (NS)		
KY.6.NS.1	Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions.	**MP.1 MP.2 MP.3**	**6.NS.1**	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
KY.6.NS.2	Fluently divide multi-digit numbers using an algorithm. *a. Convert a rational number to a decimal using long division.* *b. Know that the decimal form of a rational number terminates in 0s or eventually repeats.*	**MP.7 MP.8**	**6.NS.2**	Fluently divide multi-digit numbers using the standard algorithm.
KY.6.NS.3	Fluently add, subtract, multiply and divide multi-digit decimals using an algorithm for each operation.	**MP.2 MP.6**	**6.NS.3**	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
KY.6.NS.4	Use the distributive property to express a sum of two whole numbers 1 – 100 with a common factor as a multiple of a sum of two whole numbers with no common factor.	**MP.8**	**6.NS.4**	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
KY.6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	**MP.1 MP.2 MP.4**	**6.NS.5**	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
KY.6.NS.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes, using appropriate range and intervals, to represent points on the line and in the plane, that include negative numbers and coordinates. *a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a negative number is a positive, and the opposite of a negative number is a positive, such as −(−3)=3.* *b. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.* *c. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize the similarity between whole numbers, their negative opposites and their positions on a number line, ordered pairs differ only by signs and their locations on one or both axes.*	**MP.2 MP.4**	**6.NS.6**	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
KY.6.NS.7	Understand ordering and absolute value of rational numbers. *a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.* *b. Write, interpret and explain statements of order for rational numbers in real-world contexts.* *c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.* *d. Distinguish comparisons of absolute value from statements about order.*	**MP.1 MP.2 MP.4**	**6.NS.7**	Understand ordering and absolute value of rational numbers.
KY.6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	**MP.5 MP.7**	**6.NS.8**	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Level 6 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Expressions and Equations (EE)				
KY.6.EE.1	Write and evaluate numerical expressions involving whole-number exponents.	**MP.2** **MP.6**	**6.EE.1**	Write and evaluate numerical expressions involving whole-number exponents.
KY.6.EE.2	Write, read and evaluate expressions in which letters stand for numbers. *a. Write expressions that record operations with numbers and with letters standing for numbers.* *b. Identify parts of an expression using mathematical terms (sums, term, product, factor, quotient, coefficient); view one or more parts of an expression in a single entity.* *c. Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).*	**MP.1** **MP.3** **MP.4**	**6.EE.2**	Write, read, and evaluate expressions in which letters stand for numbers.
KY.6.EE.3	Apply the properties of operations to generate equivalent expressions.	**MP.7** **MP.8**	**6.EE.3**	Apply the properties of operations to generate equivalent expressions.
KY.6.EE.4	Identify when two expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them.	**MP.2** **MP.3** **MP.7**	**6.EE.4**	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
KY.6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	**MP.1** **MP.2** **MP.7**	**6.EE.5**	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
KY.6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.	**MP.2** **MP.6**	**6.EE.6**	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
KY.6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	**MP.1** **MP.2** **MP.3** **MP.4**	**6.EE.7**	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
KY.6.EE.8	Write an inequality of the form x>c, x<c, x≥c, or x≤c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of these forms have infinitely many solutions; represent solutions of such inequalities on vertical and horizontal number lines.	**MP.3** **MP.7**	**6.EE.8**	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
KY.6.EE.9	Use variables to represent two quantities in a real-world problem that changes in relationship to one another; *a. Appropriately recognize one quantity as the dependent variable and the other as the independent variable.* *b. Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.* *c. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the question.*	**MP.3** **MP.4** **MP.7**	**6.EE.9**	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.

Level 6 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.6.G.1	Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and quadrilaterals; apply these techniques in the context of solving real-world and mathematical problems.	**MP.1 MP.6 MP.8**	**6.G.1**	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
KY.6.G.2	Find the volume of a right rectangular prism with rational number edge lengths. Apply the formulas V = lwh and V = Bh to find volumes of right rectangular prisms with rational number edge lengths in the context of solving real-world and mathematical problems.	**MP.2 MP.5 MP.6**	**6.G.2**	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = *l w h* and V = *b h* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
KY.6.G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	**MP.4 MP.5 MP.6**	**6.G.3**	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
KY.6.G.4	Classify three-dimensional figures including cubes, prisms, pyramids, cones and spheres.	**MP.2 MP.3**	**6.G.4**	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
		Statistics and Probability (SP)		
KY.6.SP.0	Apply the four-step investigative process for statistical reasoning. *a. Formulate Questions: Formulate a statistical question as one that anticipates variability and can be answered with data.* *b. Collect Data: Design and use a plan to collect appropriate data to answer a statistical question.* *c. Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.*	**MP.1 MP.4**	Not included in the Simple Solutions series.	
KY.6.SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	**MP.1 MP.3 MP.6**	**6.SP.1**	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
KY.6.SP.2	Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.	**MP.2 MP.6 MP.7**	**6.SP.2**	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
KY.6.SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary.	**MP.2 MP.5 MP.6**	**6.SP.3**	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
KY.6.SP.4	Display the distribution of numerical data in plots on a number line, including dot plots, histograms and box plots.	**MP.6 MP.7**	**6.SP.4**	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
KY.6.SP.5	Summarize numerical data sets in relation to their context, such as by: *a. Reporting the number of observations.* *b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.* *c. Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data.* *d. Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range).* *e. Relating the choice of measures of center and variability to the shape of the data distribution.*	**MP.3 MP.7**	**6.SP.5**	Summarize numerical data sets in relation to their context.

Level 7 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Ratios & Proportional Relationships (RP)				
KY.7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	**MP.2** **MP.6**	**7.RP.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
KY.7.RP.2	Recognize and represent proportional relationships between quantities. *a. Decide whether two quantities represent a proportional relationship.* *b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships.* *c. Represent proportional relationships by equations.* *d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.*	**MP.1** **MP.2** **MP.3**	**7.RP.2**	Recognize and represent proportional relationships between quantities.
KY.7.RP.3	Use percents to solve mathematical and real-world problems. *a. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, a part and a percent, given two of these.* *b. Use proportional relationships to solve multistep ratio and percent problems.*	**MP.5** **MP.6**	**7.RP.3**	Use proportional relationships to solve multistep ratio and percent problems.
The Number System (NS)				
KY.7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. *a. Describe situations in which opposite quantities combine to make 0.* *b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.* *c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts.* *d. Apply properties of operations as strategies to add and subtract rational numbers.*	**MP.2** **MP.4** **MP.7**	**7.NS.1**	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

Level 7 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
KY.7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. *a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.* *b. Understand that integers can be divided, provided that the divisor is not zero and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.* *c. Apply properties of operations as strategies to multiply and divide rational numbers.*	**MP.2** **MP.7** **MP.8**	**7.NS.2**	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
KY.7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	**MP.1** **MP.2** **MP.5**	**7.NS.3**	Solve real-world and mathematical problems involving the four operations with rational numbers.
Expressions and Equations (EE)				
KY.7.EE.1	Apply properties of operations as strategies to add, subtract, factor and expand linear expressions with rational coefficients.	**MP.2** **MP.3**	**7.EE.1**	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
KY.7.EE.2	Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related.	**MP.7** **MP.8**	**7.EE.2**	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
KY.7.EE.3	Solve real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	**MP.1** **MP.4** **MP.6**	**7.EE.3**	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
KY.7.EE.4	Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. *a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q and r are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem.* *b. Solve word problems leading to inequalities of the form $px + q > r$, $px + q < r$, $px + q \geq r$, $px + q \leq r$; where p, q and r are specific rational numbers. Graph the solution set of the inequality and interpret it in context of the problem.*	**MP.2** **MP.4**	**7.EE.4**	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Level 7 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**MP.1** **MP.2** **MP.5**	**7.G.1**	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
KY.7.G.2	Draw (freehand, with ruler and protractor and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	**MP.6** **MP.7**	**7.G.2**	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
KY.7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	**MP.5** **MP.6**	**7.G.3**	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
KY.7.G.4	Use formulas for area and circumference of circles and their relationships. *a. Apply the formulas for the area and circumference of a circle to solve real-world and mathematical problems.* *b. Explore and understand the relationship between the radius, diameter, circumference and area of a circle.*	**MP.1** **MP.2** **MP.8**	**7.G.4**	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
KY.7.G.5	Apply properties of supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	**MP.3** **MP.6** **MP.7**	**7.G.5**	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
KY.7.G.6	Solve problems involving area of two-dimensional objects and surface area and volume of three-dimensional objects. *a. Solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles, quadrilaterals and other polygons.* *b. Solve real-world and mathematical problems involving volume and surface area, using nets as needed, of three-dimensional objects including cubes, pyramids and right prisms.*	**MP.3** **MP.4** **MP.5**	**7.G.6**	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
		Statistics and Probability (SP)		
KY.7.SP.0	Create displays, including circle graphs (pie charts), scaled pictographs and bar graphs, to compare and analyze distributions of categorical data from both matching and different-sized samples.	**MP.2** **MP.3** **MP.6**	Not included in the Simple Solutions series.	
KY.7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	**MP.3** **MP.6**	**7.SP.1**	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

Level 7 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
KY.7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. *a. Generate multiple samples of categorical data of the same size to gauge the variation in estimates or predictions.* *b. Generate multiple samples (or simulated samples) of numerical data to gauge the variation in estimates or predictions.* *c. Gauge how far off an estimate or prediction might be related to a population character of interest.*	**MP.2** **MP.3** **MP.7**	**7.SP.2**	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
KY.7.SP.3	Describe the degree of visual overlap (and separation) from the graphical representations of two numerical data distributions (box plots, dot plots) with similar variabilities with similar contexts (same variable), measuring the difference between the centers (medians or means) by expressing this difference as a multiple of a measure of variability (interquartile range when comparing medians or the mean absolute deviation when comparing means).	**MP.1** **MP.5** **MP.7**	**7.SP.3**	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
KY.7.SP.4	Calculate and use measures of center (mean and median) and measures of variability (interquartile range when comparing medians and mean absolute deviation when comparing means) for numerical data from random samples to draw informal comparative inferences about two populations.	**MP.2** **MP.5** **MP.7**	**7.SP.4**	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
KY.7.SP.5	Describe the probability of a chance event is a number between 0 and 1, which tells how likely the event is, from impossible (0) to certain (1). A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely and a probability near 1 indicates a likely event.	**MP.5** **MP.6** **MP.7**	**7.SP.5**	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
KY.7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency and predict the approximate relative frequency given the probability.	**MP.1** **MP.2**	**7.SP.6**	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
KY.7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. *a. Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events.* *b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.*	**MP.4** **MP.7** **MP.8**	**7.SP.7**	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

Level 7 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
KY.7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams and simulation. *a. Explain just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.* *b. Represent sample spaces for compound events described in everyday language using methods such as organized lists, tables and tree diagrams.* *c. Design and use a simulation to generate frequencies for compound events.*	**MP.2** **MP.4** **MP.7**	**7.SP.8**	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

Level 8 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		The Number System (NS)		
KY.8.NS.1	Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.	**MP.2 MP.6 MP.7**	**8.NS.1**	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
KY.8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram and estimate the value of expressions.	**MP.2 MP.7 MP.8**	**8.NS.2**	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.
		Expressions and Equations (EE)		
KY.8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions.	**MP.3 MP.7 MP.8**	**8.EE.1**	Know and apply the properties of integer exponents to generate equivalent numerical expressions.
KY.8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that perfect squares and perfect cubes are rational.	**MP.5 MP.6**	**8.EE.2**	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
KY.8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 (Scientific Notation) to estimate very large or very small quantities and express how many times larger or smaller one is than the other.	**MP.3 MP.5 MP.6**	**8.EE.3**	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
KY.8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.	**MP.2 MP.5 MP.6**	**8.EE.4**	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
KY.8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	**MP.2 MP.3 MP.4**	**8.EE.5**	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.
KY.8.EE.6	Use similar triangles to explain why the slope, m, is the same between any two distinct points on a non-vertical line in the coordinate plane; know the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	**MP.3 MP.4 MP.7**	**8.EE.6**	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Level 8 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
KY.8.EE.7	Solve linear equations in one variable. *a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).* *b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.*	**MP.2** **MP.3** **MP.7**	**8.EE.7**	Solve linear equations in one variable.
KY.8.EE.8	Analyze and solve a system of two linear equations. *a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously; understand that a system of two linear equations may have one solution, no solution, or infinitely many solutions.* *b. Solve systems of two linear equations in two variables algebraically by using substitution where at least one equation contains at least one variable whose coefficient is 1 and by inspection for simple cases* *c. Solve real-world and mathematical problems leading to two linear equations in two variables.*	**MP.1** **MP.3** **MP.4**	**8.EE.8**	Analyze and solve pairs of simultaneous linear equations.

Level 8 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Functions (F)		
KY.8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	**MP.7 MP.8**	**8.F.1**	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
KY.8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**MP.1 MP.2 MP.4**	**8.F.2**	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
KY.8.F.3	Understand properties of linear functions. *a. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line.* *b. Identify and give examples of functions that are not linear.*	**MP.7**	**8.F.3**	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
KY.8.F.4	Construct a function to model a linear relationship between two quantities. *a. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph.* *b. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.*	**MP.4 MP.5 MP.8**	**8.F.4**	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
KY.8.F.5	Use graphs to represent functions. *a. Describe qualitatively the functional relationship between two quantities by analyzing a graph.* *b. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.*	**MP.3 MP.7**	**8.F.5**	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Level 8 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
		Geometry (G)		
KY.8.G.1	Verify experimentally the properties of rotations, reflections and translations: • *Lines are congruent to lines.* • *Line segments are congruent to line segments of the same length.* • *Angles are congruent to angles of the same measure.* • *Parallel lines are congruent to parallel lines.*	**MP.5** **MP.6**	**8.G.1**	Verify experimentally the properties of rotations, reflections, and translations.
KY.8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections and translations. Given two congruent figures, describe a sequence that exhibits the congruence between them.	**MP.2** **MP.7**	**8.G.2**	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
KY.8.G.3	Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	**MP.3** **MP.5** **MP.6**	**8.G.3**	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
KY.8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations and dilations. Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	**MP.2** **MP.5** **MP.7**	**8.G.4**	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
KY.8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal and the angle-angle criterion for similarity of triangles.	**MP.3**	**8.G.5**	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.
KY.8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	**MP.3** **MP.7**	**8.G.6**	Explain a proof of the Pythagorean Theorem and its converse.
KY.8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	**MP.1** **MP.2** **MP.4**	**8.G.7**	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
KY.8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	**MP.5** **MP.6**	**8.G.8**	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
KY.8.G.9	Apply the formulas for the volumes and surface areas of cones, cylinders and spheres and use them to solve real-world and mathematical problems.	**MP.1** **MP.7** **MP.8**	**8.G.9**	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Level 8 - Mathematics

Kentucky Academic Standards			*Simple Solutions* Standards	
Standard	***Description***	***Standard for Mathmatical Practice***	***Standard***	***Description***
Statistics and Probability (SP)				
KY.8.SP.1	Construct and interpret scatter plots for bivariate numerical data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association.	**MP.2 MP.7**	**8.SP.1**	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
KY.8.SP.2	Know that lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a line and informally assess the model fit by judging the closeness of the data points to the line.	**MP.2**	**8.SP.2**	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
KY.8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate numerical data, interpreting the slope and intercept.	**MP.2 MP.4**	**8.SP.3**	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
	Additional Material in Simple Solutions Level 8. ---->		**8.SP.4**	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.