3rd Grade – Mathematics

Kentucky Academic Standards with Targets

Grade Level/ Course: 3rd Grade	
Standard with code:	**3.OA.1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each.** ***For example, describe a context in which a total number of objects can be expressed as 5 x 7.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Represent and solve problems involving multiplication and division.**
Type: _____Knowledge __X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Find the product of multiple groups of objects	Interpret products of whole numbers as a total number of objects in a number of groups		

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

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Grade Level/ Course : 3rd Grade	
Standard with code:	**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.** ***For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.***
Domain:	**Operation and Algebraic Thinking**
Cluster:	**Represent and solve problems involving multiplication and division.**
Type: _____Knowledge __X____Reasoning ____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know what the numbers in a division problem represent.	Explain what division means and how it relates to equal shares. Interpret quotients as the number of shares or the number of groups when a set of objects is divided equally.		

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.0A.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.[1]** **[1]See Common Core State Standards, Glossary, Table 2**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Represent and solve problems involving multiplication and division.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply and divide within 100.	Solve word problems in situations involving equal groups, arrays, and measurement quantities. Represent a word problem using a picture, an equation with a symbol for the unknown number, or in other ways.		

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.** ***For example, determine the unknown number that makes the equation true in each of the equations 8 X ? = 48, 5 = ☐ ÷ 3, 6 X 6 = ?.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Represent and solve problems involving multiplication and division.**
Type: _____Knowledge __X__Reasoning _____Performance Skill _____ Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply and divide within 100.	Determine which operation (multiplication or division) is needed to determine the unknown whole number. Solve to find the unknown whole number in a multiplication or division equation.		

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

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.OA.5 Apply properties of operations as strategies to multiply and divide.**[2] ***Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*** [2] **Students need not use formal terms for these properties.**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Understand properties of multiplication and the relationship between multiplication and division.**
Type: _____Knowledge _X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Multiply and divide within 100.	Explain how the properties of operations work. Apply properties of operations as strategies to multiply and divide.		

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

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.OA.6 Understand division as an unknown-factor problem.** ***For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Understand properties of multiplication and the relationship between multiplication and division.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify the multiplication problem related to the division problem. Identify the unknown factor in the related multiplication problem.	Use multiplication to solve division problems. Recognize multiplication and division as related operations and explain how they are related.		

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

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 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.**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Multiply and divide within 100.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know from memory all products of two one-digit numbers	Analyze a multiplication or division problem in order to choose an appropriate strategy to fluently multiply or divide within 100		

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Grade Level/ Course: 3rd Grade	
Standard with code:	**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.** [3] **[3] This standard is limited to problems posed with whole numbers and having whole-number answers; student should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).**
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Solve problems involving the four operations, and identify and explain patterns in arithmetic.**
Type: _____Knowledge __X____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know the order of operations (without parentheses). Know strategies for estimating.	Construct an equation with a letter standing for the unknown quantity. Solve two-step word problems using the four operations. Justify your answer using various estimation strategies.		

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

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.** ***For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.***
Domain:	**Operations and Algebraic Thinking**
Cluster:	**Solve problems involving four operations, and identify and explain patterns in arithmetic.**
Type: _____Knowledge __X____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify arithmetic patterns (such as even and odd numbers, patterns in an addition table, patterns in a multiplication table, patterns regarding multiples and sums)	Explain rules for a pattern using properties of operations. (Properties of operations, glossary page 90 Common Core State Standards) Explain relationships between the numbers in a pattern.		

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.**
Domain:	**Number and Operations in Base Ten**
Cluster:	**Use place value understanding and properties of operations to perform multi-digit arithmetic.[4]** **[4]A range of algorithms may be used.**
Type: ___X___Knowledge _____Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define "round or rounding" in relation to place value Round a whole number to the nearest 10 Round a whole number to the nearest 100			

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Grade Level/ Course: 3rd Grade	
Standard with code:	**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.**
Domain:	**Numbers and operations in base 10**
Cluster:	**Use place value understanding and properties of operations to perform multi-digit arithmetic.[4]** **[4]A range of algorithms may be used.**
Type: ___X__ Knowledge _____ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know strategies and algorithms for adding and subtracting within 1000. Fluently add and subtract within 1000.			

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

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.**
Domain:	**Numbers and Operations in Base Ten**
Cluster:	**Use place value understanding and properties of operations to perform multi-digit arithmetic.** [4] [4]**A range of algorithms may be used.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know strategies to multiply one-digit numbers by multiples of 10 (up to 90).	Apply knowledge of place value to multiply one-digit whole numbers by multiples of 10 in the range 10-90		

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**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*.**
Domain:	**Number and Operations – Fractions[5]** **[5]Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge ___ X ___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize a unit fraction such as ¼ as the quantity formed when the whole is partitioned into 4 equal parts Identify a fraction such as 2/3 and explain that the quantity formed is 2 equal parts of the whole partitioned into 3 equal parts (1/3 and 1/3 of the whole 3/3)	Express a fraction as the number of unit fractions. Use accumulated unit fractions to represent numbers equal to, less than and greater than one (1/3 and 1/3 is 2/3; 1/3, 1/3, 1/3, and 1/3 is 4/3)		

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.NF.2a Understand a fraction as a number on the number line; represent fractions on a number line diagram.** **a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/b and that the endpoint of the part based on 0 locates the number 1/b on the number line.**
Domain:	**Number and Operations – Fractions[5]** **[5]Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge ___X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define the interval from 0 to 1 on a number line as the whole. Divide a whole on a number line into equal parts. Recognize that the equal parts between 0 and 1 have a fractional representation.	Represent each equal part on a number line with a fraction. Explain that the end of each equal part is represented by a fraction (1/the number of equal parts).		

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

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Grade Level/ Course: 3rd Grade	
Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.NF.2b Understand a fraction as a number on the number line; represent fractions on a number line diagram.** **b. Represent a fraction a/b on a number line diagram by marking off *a* lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.**
Domain:	**Number and Operations – Fractions[5]** **[5]Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge ____X__Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define the interval from 0 to 1 on a number line as the whole. Divide a whole on a number line into equal parts.	Represent each equal part on a number line with a fraction. Explain that the endpoint of each equal part represents the total number of equal parts. I----------I----------I----------I----------I 0 ¼ 2/4 ¾ 4/4 1		

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Standard with code:	**3.NF.3ab 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 the same point on a number line.** **b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.**
Domain:	**Number and Operations – Fractions[5]** **[5]Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge __X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Describe equivalent fractions. Recognize simple equivalent fractions.	Compare fractions by reasoning about their size to determine equivalence. Use number lines, size, visual fraction models, etc. to find equivalent fractions.		

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.NF.3c** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*
Domain:	**Number and Operations – Fractions**[5] [5]**Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge ___X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Recognize whole numbers written in fractional parts on a number line. Recognize the difference in a whole number and a fraction	Explain how a fraction is equivalent to a whole number.		

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Grade Level/ Course: 3rd Grade	
Standard with code:	**3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.** **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, e.g., by using a visual fraction model.**
Domain:	**Number and Operations – Fractions[5]** **[5]Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.**
Cluster:	**Develop understanding of fractions as numbers.**
Type: _____Knowledge __X___ Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Explain what the numerator in a fraction represents and its location. Explain what the denominator in a fraction represents and its location. Recognize whether fractions refer to the same whole.	Determine if comparisons of fractions can be made (if they refer to the same whole). Compare two fractions with the same numerator by reasoning about their size. Compare two fractions with the same denominator by reasoning about their size. Record the results of comparisons using symbols >, =, or <. Justify conclusions about the equivalence of fractions.		

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**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.**
Domain:	**Measurement and Data**
Cluster:	**Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**

Type: ____Knowledge ____Reasoning __X__Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Recognize minute marks on analog clock face and minute position on digital clock face. Know how to write time to the minute. Tell time to the minute.	Compare an analog clock face with a number line diagram. Use a number line diagram to add and subtract time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.	Tell time to the minute.	

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

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Grade Level/Course (high School): 3rd Grade							
Standard with Code:	**3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[6] 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.[7]** **[6] Excludes compound units such as cm^3 and finding the geometric volume of a container.** **[7] Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2).**						
Domain:	**Measurement and Data**						
Cluster:	**Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**						
Type: ____Knowledge ____Reasoning __X__Performance Skill _____Product							
Knowledge Targets		**Reasoning Targets**		**Performance Skill Targets**		**Product Targets**	
Explain how to measure liquid volume in liters. Explain how to measure mass in grams and kilograms. Add, subtract, multiply and divide units of liters, grams, and kilograms. Know various strategies to represent a word problem involving liquid volume or mass.		Solve one step word problems involving masses given in the same units. Solve one step word problems involving liquid volume given in the same units.		Measure liquid volumes using standard units of liters. Measure mass of objects using standard units of grams (g), and kilograms (kg).			
Make sense of problems and persevere in solving them.	Reason abstractly and quantitatively.	Construct viable arguments and critique the reasoning of others.	Model with Mathematics	Use appropriate tools strategically.	Attend to precision.	Look for and make use of structure.	Look for and express regularity in repeated reasoning.

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**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.** ***For example, draw a bar graph in which each square in the bar graph might represent 5 pets.***
Domain:	**Measurement and Data**
Cluster:	**Represent and interpret data.**
Type: _____Knowledge _____Reasoning _____Performance Skill ___X___Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Explain the scale of a graph with a scale greater than one. Identify the scale of a graph with a scale greater than one.	Analyze a graph with a scale greater than one. Choose a proper scale for a bar graph or picture graph. Interpret a bar/picture graph to solve one or two step problems asking "how many more" and "how many less".		Create a scaled picture graph to show data. Create a scaled bar graph to show data.

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**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.**
Domain:	**Measurement & Data**
Cluster:	**Represent and interpret data.**
Type: _____Knowledge _____Reasoning _____Performance Skill ___X___Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Define horizontal axis. Identify each plot on the line as data or a number of objects.	Analyze data from a line plot. Determine appropriate unit of measurement. Determine appropriate scale for line plot.	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.	Create a line plot where the horizontal scale is marked off in appropriate units- whole numbers, halves, or quarters.

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.5ab Recognize area as an attribute of plane figures and understand concepts of area measurement.** **a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.** **b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Type: ____Knowledge ____Reasoning __X__Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Define "unit square". Define area.	Relate the number (*n*) of unit squares to the area of a plane figure	Cover the area of a plane figure with unit squares without gaps or overlaps	

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Type: __X_ Knowledge ____Reasoning ____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Measure areas by counting unit squares Use unit squares of cm, m, in, ft, and other sizes of unit squares to measure area			

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.7a 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 that the area is the same as would be found by multiplying the side lengths.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Type: ____Knowledge __X_Reasoning ____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Find the area of a rectangle by tiling it in unit squares Find the side lengths of a rectangle in units	Compare the area found by tiling a rectangle to the area found by multiplying the side lengths		

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.7b Relate area to the operations of multiplication and addition.** **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.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Type: ____Knowledge __X_Reasoning ____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Multiply side lengths to find areas of rectangles	Solve real world and mathematical area problems by multiplying side lengths of rectangles Use rectangular arrays to represent whole-number products in multiplication problems		

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

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Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.7c Relate area to the operations of multiplication and addition.** **c. Use tiling to show in a concrete case that 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.** ***Parentheses were added (b+c) to provide clarity.***
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Type: ____Knowledge __X_Reasoning ____Performance Skill _____Product

Knowledge Targets	Reasoning Targets	Performance Skill Targets	Product Targets
Multiply using an area model (array).	Relate area of a rectangle to multiplication and addition by modeling the distributive property. Area of a Rectangle 3 x (5+2) = 3x5 + 3x2		

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

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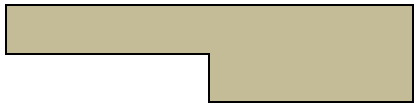
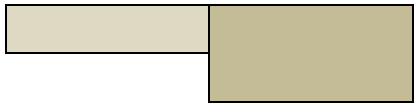
Grade Level/Course (high School): 3rd Grade	
Standard with Code:	**3.MD.7d Relate area to the operations of multiplication and addition.** **d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**
Type: ____Knowledge ___Reasoning __X_Performance Skill _____Product	

Knowledge Targets	**Reasoning Targets**	**Performance Skill Targets**	**Product Targets**
Find areas of rectangles Add areas of rectangles Recognize that areas of each rectangle in a rectilinear (straight line) figure can be added together to find the area of the figure	Use the technique of decomposing rectilinear figures to find the area of each rectangle to solve real world problems	Decompose rectilinear figures into non-overlapping rectangles For example, this shape decomposes into  these two rectangles 	

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**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.**
Domain:	**Measurement and Data**
Cluster:	**Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.**
Type: _____Knowledge _____Reasoning _____Performance Skill ___X___Product	

Knowledge Target	Reasoning Target	Performance Skill	Product Target
Define a polygon. Define perimeter.	Find the perimeter when given the length of sides Find the perimeter when there is an unknown side length		Exhibit (design, create, draw, model, etc.) rectangles with the same perimeter and different areas. Exhibit rectangles with the same area and different perimeters.

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**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.**
Domain:	**Geometry**
Cluster:	**Reason with shapes and their attributes.**
Type: _____Knowledge _____Reasoning _____Performance Skill __X___Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Identify and define rhombuses, rectangles, and squares as examples of quadrilaterals based on their attributes.	Describe, analyze, and compare properties of two-dimensional shapes. Compare and classify shapes by attributes, sides and angles. Group shapes with shared attributes to define a larger category (e.g., quadrilaterals)		Draw examples of quadrilaterals that do and do not belong to any of the subcategories.

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

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Grade Level/ Course (HS): 3rd Grade	
Standard with code:	**3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.** ***For example, partition a shape into 4 parts with equal area, and describe the area of each part as ¼ of the area of the shape.***
Domain:	**Geometry**
Cluster:	**Reason with shapes and their attributes.**
Type: _____Knowledge __X___Reasoning _____Performance Skill _____Product	

Knowledge Targets	Reasoning Targets	Performance Skills Targets	Product Targets
Know that shapes can be partitioned into equal areas. Describe the area of each part as a fractional part of the whole.	Relate fractions to geometry by expressing the area of part of a shape as a unit fraction of the whole. (See 3rd grade introduction).		

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

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