Pike County School District Standards Mastery Document

3rd Grade Mathematics Revised 2019



The Standards Mastery Document is designed for educators by educators as a resource and tool to help educators increase their depth of understanding of the Common Core Standards. This document will enable teachers to plan College & Career Ready curriculum and classroom instruction that promotes inquiry and higher levels of cognitive demand.

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education.

8 Mathematical Practices (MP):

- MP 1. Make sense of problems and persevere in solving them.
- MP 2. Reason abstractly and quantitatively.
- MP 3. Construct viable arguments and critique the reasoning of others.
- MP 4. Model with mathematics.
- MP 5. Use appropriate tools strategically.
- MP 6. Attend to precision.
- MP 7. Look for and make use of structure.
- MP 8. Look for and express regularity in repeated reasoning.

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Kentucky Academic Standards for Mathematics: Grade 3 Overview

Operations/Algebraic Thinking (OA)	Number and Operations in Base Ten (NBT)	Number and Operations Fractions (NF)	Measurement and Data (MD)	Geometry (G)
 Represent and solve problems involving multiplication and division. Understand properties of multiplication and the relationship between multiplication and division. Multiply and divide within 100. Solve problems involving the four operations and identify and explain patterns in arithmetic. 	 Use place value understanding and properties of operations to perform multi-digit arithmetic. Note: A range of algorithms may be used. 	 Develop understanding of fractions as numbers. Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, 8. 	 Solve problems involving measurement and estimation of intervals of time, liquid volumes and masses of objects. Understand and apply the statistics process. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. 	 Reason with shapes and their attributes.

In grade 3, instructional time should focus on four critical areas:

1. In the Operations and Algebraic Thinking domain, students will:

- develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays and area models; multiplication is finding an unknown product and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size;
- use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors; and
- compare a variety of solution strategies to learn the relationship between multiplication and division.

2. In the Number Sense and Operations—Fractions domain, students will:

- develop an understanding of fractions, beginning with unit fractions;
- view fractions in general as being built out of unit fractions and use fractions along with visual fraction models to represent parts of a whole;
 understand that the size of a fractional part is relative to the size of the whole. Use fractions to represent numbers equal to, less than and
- greater than one; and
 solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

3. In the Measurement and Data domain, students will:

- recognize area as an attribute of two-dimensional regions;
- measure the area of a shape by finding the total number of same-size units of area required to cover the shape without gaps or overlaps, a
 square with sides of unit length being the standard unit for measuring area; and
- understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication and justify using multiplication to determine the area of a rectangle.

4. In the Geometry domain, students will:

- compare and classify shapes by their sides and angles; and
- relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

Note: Multiplication, division and fractions are the most important developments in grade 3.

	Result Unknown	Change Unknown	Start Unknown
Add To	Two bunnies sat on the grass. Three	Two bunnies were sitting on the	Some bunnies were sitting on the
	more bunnies hopped there. How	grass. Some more bunnies hopped	grass. Three more bunnies hopped
	many bunnies are on the grass	there. Then there were five	there. Then there were five
	now?	bunnies. How many bunnies	bunnies. How many bunnies were
		hopped over to the first two?	on the grass before?
	2 + 3 = ?		
		2 + ? = 5	? + 3 = 5
Take From	Five apples were on the table. I ate	Five apples were on the table. I ate	Some apples were on the table. I
	two apples. How many apples are	some apples. Then there were three	ate two apples. Then there were
	on the table now?	apples. How many apples did I	three apples. How many apples
		eat?	were on the table before?
	5 - 2 = ?		
		5 - ? = 3	? - 2 = 3
	Total Unknown	Addend Unknown	Both Addends Unknown ³
Put Together/	Three red apples and two green	Five apples are on the table. Three	Grandma has five flowers. How
Take Apart ²	apples are on the table. How many	are red and the rest are green. How	many can she put in her red vase
	apples are on the table?	many apples are green?	and how many in her blue vase?
	3 + 2 = ?	3 + ? = 5, 5 – 3 = ?	5 = 0 + 5, 5 = 5 + 0
			5 = 1 + 4, 5 = 4 + 1
			5 = 2 + 3, 5 = 3 + 2
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	("How many more?" version):	(Version with "more"):	(Version with "more"):
	Lucy has two apples. Julie has five	Julie has three more apples than	Julie has three more apples than
	apples. How many more apples	Lucy. Lucy has two apples. How	Lucy. Julie has five apples. How
	does Lucy have than Julie?	many apples does Julie have?	many apples does Lucy have?
	("How many fewer?" version):	(Version with "fewer"):	(Version with "fewer"):
	Lucy has two apples. Julie has five	Lucy has three fewer apples than	Lucy has three fewer apples than
	apples. How many fewer apples	Julie. Lucy has two apples. How	Julie. Julie has five apples. How
	does Lucy have than Julie?	many apples does Julie have?	many apples does Lucy have?
	2 + ? = 5, 5 – 2 = ?	2 + 3 = ? , 3 + 2 = ?	5 – 3 = ?, ? + 3 = 5

Table 1 **Common Addition and Subtraction Situations**¹

Blue shading indicates the four Kindergarten problem subtypes. Students in grades 1 and 2 work with all subtypes and variants (blue and green). Yellow indicates problems that are the difficult four problem subtypes students in grade 1 work with but do not need to master until grade 2.

¹ Adapted from Box 2-4 of National Research Council (2009, op. cit., pp. 32, 33).

small numbers less than or equal to 10.

² These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help

children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
³ Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation especially for

⁴ For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller

	Unknown Product	Group Size Unknown	Number of Groups Unknown
	3 × 6 = ?	3 × ? = 18 and 18 ÷ 3 = ?	? × 6 = 18 and 18 ÷ 6 = ?
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag?	If 18 plums are to be packed 6 to a bag, then how many bags are needed?
	Measurement example: you need 3 lengths of string, each 6 inches long. How much string will you need all together?	Measurement example: you have 18 inches of string which you will cut into 3 equal pieces. How long will each piece of string be?	Measurement example: you have 18 inches of string which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays ² Area ³	There are three rows of apples with 6 apples in each row. How many apples are there?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be?
	Area example: what is the area of a 3 cm by 6 cm triangle?	Area example: a rectangle has area of 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	Area example: a rectangle has area of 18 square centimeters. If one side is 6 cm long, how long is the side next to it?
Compare	A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost?	A red hat costs \$18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost?	A red hat costs \$18 and a blue hat costs \$6. How many times as much does the red hat cost as the blue?
	Measurement example: a rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?	Measurement example: a rubber band is stretched to be 18 cm long and is 3 times as long as it was at first. How long was the rubber band at first?	Measurement example: a rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	a × b = ?	a × ? = p and p ÷ a = ?	? × b = p and p ÷ b = ?

Table 2Common Multiplication and Division Situations1

¹ The first examples in each cell are examples of discrete things. These are easier for students and should be given before the measurement examples.

² The language in the array examples shows the easiest form of array problems. A harder form is to use the terms rows and columns: the apples in the grocery window are in 3 rows and 6 columns. How many apples are in there? Both forms are valuable.

³ Area involves arrays of squares that have been pushed together so that there are no gaps or overlaps, so array problems include these especially important measurement situations.

Table 3 Properties of Operations

The variables *a*, *b* and *c* stand for arbitrary numbers in a given number system. The properties of operations apply to the rational number system, the real number system and the complex number system.

Associative property of addition	(a+b)+c=a+(b+c)
Commutative property of addition	a + b = b + a
Additive identity property of 0	a + 0 = 0 + a = a
Existence of additive inverses	For every a there exists -a so that a + (-a) = (-a) + a
	= 0
Associative property of multiplication	$(a \times b) \times c = a \ x \ (b \times c)$
Commutative property of multiplication	$a \times b = b \times a$
Multiplicative identity property of 1	$a \times 1 = 1 \times a = a$
Existence of multiplicative inverses	For every $a \neq 0$ there
	exists 1/a so that $a \times 1/a = 1/a \times a = 1$
Distributive property of multiplication over	$a \times (b + c) = a \times b + a \times c$
addition	

Table 4 Properties of Equality

The variables *a*, *b* and *c* stand for arbitrary numbers in the rational, real or complex number systems.

Reflexive property of equality	a = a
Symmetric property of equality	If $a = b$, then $b = a$
Transitive property of equality	If $a = b$ and $b = c$, then $a = c$
Addition property of equality	lf a = b, then a + c = b + c
Subtraction property of equality	If $a = b$, then $a - c = b - c$
Multiplication property of equality	lf a = b, then a x c = b x c
Division property of equality	lf a = b and c ≠ 0, then a ÷ c = b ÷ c
Substitution property of equality	If a = b, then b may be substituted for a in any
	expression containing a.

Table 5 Properties of Inequality

The variables *a*, *b* and *c* stand for arbitrary numbers in the rational or real number systems.

xactly one of the following is true: a < b, a = b, a > b
a > b and b > c then a > c
a > b, then b < a
a > b, then –a < -b
$a > b$, then $a \pm c > b \pm c$
a > b and c > 0, then a x c > b x c
a > b and c < 0, then a x c < b x c
$a > b$ and $c > 0$, then $a \div c > b \div c$
a > b and c < 0, then a ÷ c < b ÷ c

Table 6Fluency Standards across All Grade Levels

Grade	Coding	Fluency Standards
К	KY.K.OA.5	Fluently add and subtract within 5.
1	KY.1.OA.6	Fluently add and subtract within 10.
2	KY.2.OA.2 KY.2.NBT.5	Fluently add and subtract within 20. Fluently add and
		subtract within 100.
3	KY.3.OA.7 KY.3.NBT.2	Fluently multiply and divide within 100. Fluently add
		and subtract within 1000.
4	KY.4.NBT.	Fluently add and subtract multi-digit whole numbers
		using an algorithm.
5	KY.5.NBT.5	Fluently multiply multi-digit whole numbers (not to
		exceed four-digit by two-digit multiplication) using an
		algorithm.
6	KY.6.NS.2 KY.6.NS.3 KY.6.EE.2	Fluently divide multi-digit numbers using an algorithm.
		Fluently add, subtract, multiply and divide multi-digit
		decimals using an algorithm for each operation.
		Write, read and evaluate expressions in which letters
		stand for numbers.

Operations and Algebraic Thinking

Standard: 3.OA.1

Interpret and demonstrate products of whole number.

Enduring Skills:

MP 2: Use quantitative reasoning.

MP 5: Use appropriate tools strategically.

Know: What content does the	<u>Do:</u> What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
	Associative/Commutative property	
Multiplication facts	of multiplication.	Example:
		2X4 $4X2$
Area model	Use concrete materials to model	We can represent this by drawing & plates (aroups) of # cookies 4 plates (aroups) of # cookies
	various multiplication situations.	
Array model		
	Identify the number of groups and	This can also be represented using repeated additions 4+4 This can also be represented using repeated additions 2+2+2+2+
Fact families	the number of items in each group.	Both number sentences give us a total of 8 cookies.
Factors	Connect representations for	Students use models for
	multiplication situations and use	multiplication situations. For
Skip counting	appropriate vocabulary to describe	example, students interpret 5 x 7
	their work.	as the total number of objects in
		five groups of seven objects each.
	Write expressions and equations.	
		Students recognize the numbers
		and symbols in an equation such as
		5 x 8 = 40 are related to a context
		using groups or arrays

Coherence KY.2.OA.4 -> KY.3.OA.1 -> KY.4.OA.1

Operations and Algebraic Thinking

Standard: 3.OA.2

Interpret and demonstrate whole- number quotients of whole numbers where objects are partitioned into equal shares.

Enduring Skills:

MP 2: Use quantitative reasoning.

ivir J. Use appropriate tools strategically.	MP 5:	Use ap	propriate	tools	strategically.
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Karawa Milantara tanta da sa ti		
Know: What content does the	<u>Do:</u> What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Products	Use concrete materials to model	Use models for division situations.
	various division situations.	For example, students interpret 56
Fact Families		\div 8 as the number of 56 objects
	Identify the information given in	are partitioned equally into eight
Missing factor	the problem as well as the missing	shares or as a number of shares
	information	shares, or as a number of shares
	Information.	when 56 objects are partitioned
Division symbol		into equal shares of eight object
	Explain how they determined the	each and describe a context in
Division terminology-factor,	missing factor.	which a number of shares or a
product, divisor, dividend, and		number of groups can be
quotient	Use pictorial representations for	expressed as 56/8.
	division situations.	
		Student analyzes an equation and
	Represent division problems using	tells a story about walking eight
	an equation	blocks round-trip to and from
		school each day, connecting to the
		school each day, connecting to the
		equation by saying: five days x
		eight blocks each day is 40 total
		blocks walked. To represent the
		problem, they show five jumps of
		eight on an open number line or
		show five 8-unit long Cuisenaire
		Rods
		identifying each with appropriate
		math vocabulary

Operations and Algebraic Thinking

Standard: 3.OA.3

Use multiplication and division with 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.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them. MP 4: Model with mathematics.

Know: What content does the	<u>Do:</u> What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Equal groups	Work collaboratively using	Model or represent multiplication
Edan Broabs	concrete materials to represent	and division situations or context
Array models	multiplication problems.	problems (involving products and quotients up to 100). Note:
Area models	Identify the information given in	Drawings need not show detail.
	the problem and explain their	but accurately represent the
Fact families	thinking using multiplication vocabulary.	quantities involved in the task.
	,	Differentiate between
	Work collaboratively to model	multiplication and division
	related division problems.	problems
	Use mathematical symbols to	Identify the information given in
	represent the problem situation	the problem and explain their
	using either multiplication notation	reasoning using division
	with a missing factor or division	vocabulary.
	factor or division notation.	
		Example:
		I have 15 apples and 5 bags. I want
		to put the same number of apples
		in each bag. How many apples are
		in each bag?
		See TABLE 2 IN APPENDIX A

Operations and Algebraic Thinking

Standard: 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 $8 \times ? = 48$, $5 = __ \div 3$, $6 \times 6 = ?$

Enduring Skills:

MP 6: Attend to precision. MP 7: Look for and make use of structure.

Know: What content does the student need to know to	<u>Do:</u> What skill must the student demonstrate?	Mastery: How does the student demonstrate the learning of the
demonstrate this standard?		standard?
Write equations	Write and read related multiplication equations and	Example:
Fact families	equations with missing factors.	
Missing factors	Relate missing factor multiplication equations to division equations	I need 24 dolphins to give each aquarum 6 dolphins.
Basic multiplication facts	using both the division symbols for division.	15 X or ÷
		Students determine the unknown number that makes the equation true in each of the equations 8×2
		- 40, 5 - ⊔ ÷ 5, 0 X 0 = ?.

Coherence KY.3.OA.4 -> KY.4.MD.

Operations and Algebraic Thinking

Standard: 3.OA.5

Apply properties of operations as strategies to multiply and divide.

Enduring Skills:

MP 3: Construct viable arguments and critique the reasoning of others.

Know: What content does the	<u>Do:</u> What skill must the	Mastery: How does the student demonstrate
student need to know to	student demonstrate?	the learning of the standard?
demonstrate this standard?		
	Use concrete materials to	Students need not use formal terms for
Numerical Patterns	model specific multiplication	these properties. If 6 x 4 is known, then 4 x 6
	situations.	= 24 is also known (Commutative property of
Skip counting by 5's, 10's,		multiplication). 3 x 5 x 2 can be found by 3 x
100's	The order of the factors does	5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10,
	not change the product.	then 3 x 10 = 30 (Associative property of
Fact families		multiplication). Knowing that 8 x 5 = 40 and
	Decompose one factor and	8 x 2 = 16, one can find 8 x 7 as 8 x (5+2) = (8
Even and odd numbers	find the sum of those parts to	x 5) + (8 x 2) = 40 + 16 = 56 (Distributive
	help me find the product.	property).
Understanding rows and		
columns	Write equations for the	Commutative Property
	concrete examples they have	
Rectangular arrays	modeled.	2 × 4 4 × 2
Device the distance		Associative Property
Repeated addition		$(2\times3)\times4$ $2\times(3\times4)$
		<u>6 × 4</u> <u>2 × 1</u> 2
		24 - 24
		a(b+c) = ab+ac
		Distributive Property
		2x6 2x3 + 2x3

MP 4: Model with mathematics.

KY.4.NBT.5 Coherence KY.3.OA.5 -> KY.4.NBT.6

Operations and Algebraic Thinking

Standard: 3.OA.6

Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

Know: What content does the	<u>Do</u> : What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Patterns		
Fact families	Describe information in problem situations and relate that information to written multiplication and division	3.OA.6
onderstanding rows and columns	equations	
Rectangular arrays		7 x makes 56?
Missing factors Repeated subtraction	To solve 42 ÷ 6, think what number multiplied by 6 equals 42. (Fact families) Use inverse operations to solve.	???
Equal groups		Practice using missing factors to find the solution to the division
Term inverse operations		problem. Students think about 84 ÷ 4 as, "How many sets of four can be made from 84 items?" or "How many in a group, if there 84 items and four groups?" and use this relationship to solve the problem
		Describe their thinking using words and numbers.

Coherence KY.3.OA.6 -> KY.4.NBT.6

Operations and Algebraic Thinking

Standard: 3.OA.7

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that $8 \times 5 = 40$, one knows 40 / 5 = 8) or properties of operations. Note: Students determine multiplication and division strategies efficiently, accurately, flexibly, and appropriately. Being fluent means students choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and explain their approaches and they produce accurate answers efficiently. Reaching fluency is an ongoing process that will take much of the year.

Enduring Skills:

MP 2: Reason abstractly and quantitatively. MP 8: Look for and express regularity in repeated reasoning.

I	<u> </u>	<u> </u>
Know: What content does the	<u>Do</u>: What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Doubles	Solve problems and model	Use strategies based on properties
	examples that represent	and patterns of multiplication to
Commutative property	multiplication and division facts.	fluently use multiplication facts.
		, ,
Fact families	Relate models to written	Know and utilize strategies to
	equations.	determine unknown
Missing factors		products/quotients. For example.
	Develop understanding of the	students notice 4 x 6 is equivalent
Terminology- factors, missing	relationship between	to 2 x 2 x 6 (doubling strategy).
factors, products, and quotient	multiplication and division by	They know nine facts can be found
	identifying information and using	by thinking of the other factor x 10
Concrete models	information to ask themselves	and subtracting one group. For
	questions that support	example recognizing 9 x 8 is
Skin counting	understanding	equivalent to $10 \times 8 - 8$ For each
		fact the student thinks "What
		reasoning strategy can Luse that is
		more efficient than skin counting?"
		more encient than skip counting:
		Lico multiplication facts in terms of
		missing factor to loarn division
		facto
		facts.

Operations and Algebraic Thinking

Standard: 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.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

Know: What content does the	<u>Do:</u> What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Four operations (add, subtract, multiply, and divide)	Substitute a variable for an unknown number.	Explain how they solved the problem using accurate mathematical vocabulary and why their answers make sense.
Key word clues (How many	Solve problems using models	
more?)	solve problems using models,	Fluently use the four operations to
	pictures, and words, and	solve two-step word problems.
	numbers.	Solve problems using a variable.
Estimation strategies		
		a 24 40
	Use a variety of problem solving	10 x 8 = 80 total apples
Mental computation	strategies, including restating the	a + 24 + 40 = total apples and 10 x 8 = total apples. There are 80 apples total. a + 64 = 80
	problem in their own words,	a = 16
	making models, and drawing	Example:
	pictures to represent their	Maggie was picking apples from her
	thinking.	three apple trees. She picked some
	Identifying when estimation is	from the first tree and realized she
	appropriato	should count the rest of what she was
	appropriate.	picking. She picked 24 apples from the
		second tree and 40 apples from the
		third tree. She had enough apples to
		give 10 to each of eight families. How
		many apples did she pick from the first
		tree?

MP 4: Model with mathematics.

Coherence KY.2.OA.1 -> KY.3.OA.8 -> KY.4.OA.3

Operations and Algebraic Thinking

Standard: 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.

Enduring Skills:

MP 3: Construct viable arguments and critique the reasoning of others. MP 8: Look for and express regularity in repeated reasoning.



Coherence KY.2.OA.3 -> KY.3.OA.9 -> KY.4.OA.5

Number Base Ten

Standard: 3.NBT.1

Use place value understanding to round whole numbers to the nearest 10 or 100.

Enduring Skills:

MP 7: Look for and make use of structure.

Know: What content	Do: What skill must the	Mastery: How does the student
does the student need to	student demonstrate?	demonstrate the learning of the
know to demonstrate this		standard?
standard?	Given a two-digit	
	number, identify the tens	Round to the nearest 10 or 100 using
Place value	that the number falls	various strategies.
	between and plot the	52)
Procedure for rounding	number on a number line	
	between the tens.	0 10 20 30 40 50 60 70 80 90 100
Benchmark numbers		
	Determine which ten the	
Halfway mark	number is closer to and	50 51 52 53 54 55 56 57 58 59 60
	justify their reasoning.	
Hundreds charts	Given a three-digit	52 - 50
	number identify the	52 - 50
Number line	hundreds that the	
	number falls between	
Multiples of 10 and 100		
	Identify the closest	
	hundreds and plot the	Core Lesson
	number on a number line	E benchmark
	between the closest	783.00
	hundreds.	< mmaile
		700 783 800
	Determine which	780 783 790
	hundred the number is	LEARNS 7/LICN
	closer to and justify their	
	reasoning.	

Coherence KY.2.NBT.1 -> KY.3.NBT.1 -> KY.4.NBT.3

Number Base Ten

Standard: 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. Note: Reaching fluency is an ongoing process that will take much of the year.

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

Know: What content does	Do: What skill must the student	Mastery: How does the student demonstrate
the student need to know	demonstrate?	the learning of the standard?
to demonstrate this		
standard?		
		Determine addition and subtraction
Decomposing tens and	Use a variety of models,	strategies efficiently, accurately, flexibly and
hundreds	representations, and strategies to	appropriately. Being fluent means students
	solve addition and subtraction	are able to choose flexibly among methods
Add and subtract fluontly	examples and problems with	and strategies to solve contextual and
Add and subtract identity	1000	mathematical problems, they understand
10 100		and are able to explain their approaches and
		they are able to produce accurate answers
Reasonable answers		efficiently. For example, for the problem 405
	Explain their strategies and make	- 381, a student notices these values are
	sense of the strategies of others.	close to each other, so rather than take
		away 381, they find the difference. They
Self-checking strategies		count up to 400 (19) and add on five more
	Solve vertical and horizontal	to equal 24. For the problem 425 - 98, the
	aquations	student notices 98 is close to 100, so
	equations.	chooses to take away 100 and add two more
		back on to equal 327. Students share the
		strategy they used, why it works and why
		they chose it
		,
		Make connections between conceptual
		understanding and procedures for adding
		and subtracting within 1 000
		Fluently add and subtract within 1,000.
		, , , , , , , , , , , , , , , , , , , ,

KY.2.NBT.5 Coherence KY.2.NBT.7 -> KY.3.NBT.2 -> KY.4.NBT.4

Number Base Ten

Standard: 3.NBT.3

Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., to solve 8×60 students interpret this as eight groups of six tens, which is 480) using strategies based on place value and properties of operations.

Enduring Skills:

MP 7: Look for and make use of structure. MP 8: Look for and express regularity in repeated reasoning.

Know: What content does the student need to know to demonstrate this standard?	<u>Do:</u> What skill must the student demonstrate?	<u>Mastery:</u> How does the student demonstrate the learning of the standard?
Place value Basic multiplication facts	Use their understanding of the meaning of multiplication to model examples of multiplying a one-digit number by 10.	Multiplying by Multiples of 10 $\frac{40}{120} + 4 \times 3 = 12 \times 10 = 120$
	Demonstrate an understanding that a one-digit number multiplied by ten gives a multiple of 10 (for example, 6 x 10 = 60), which is the same as that number of ones (60) or that number of tens (6 tens).	To solve 8 x 60, students interpret this as eight groups of six tens,
	Model multiplication of a one-digit number by a multiple of 10 (from 10-90) using concrete materials, number lines, skip counting, and the distributive property.	which is 480. Multiply one-digit whole numbers by multiples of 10 in the range 10- 90.

KY.3.OA.5

Coherence KY.2.NBT.1 -> KY.3.NBT.3 -> KY.4.NBT.5

Number Fraction

Standard: 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. Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

Enduring Skills:

MP 2: Reason abstractly and quantitatively. MP 7: Look for and make use of structure.

Know: What content does	<u>Do:</u> What skill must the	Mastery: How does the student demonstrate
the student need to know to	student demonstrate?	the learning of the standard?
demonstrate this standard?		
Division Fraction models (circles, rectangles, bars, number lines, fraction strip models, and squares) Rows and columns Equal area	Make models of fractions (with denominators of 2, 3, 4, 6, and 8) using fractions strips. Identify the meaning of denominator and the numerator using pictures, numbers, and words. Name various parts of the whole using fractions and explain that the fraction is made up of that number of unit pieces. 5/8= 1/8 + 1/8 + 1/8 + 1/8 + 1/8	Image: Set of a WholeImage: Set of the Set of a WholeImage: Set of the Set of a WholeImage: Set of the Set

Coherence KY.2.G.3 -> KY.3.NF.1 -> KY.4.NF.3

Number Fraction

Standard: 3.NF.2

Understand a fraction as a number on the number line; represent fractions on a number line. Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8.

3.NF.2.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 that each part has size 1/b and a unit fraction, 1/b is located 1/b of a whole unit from 0 on the number line.

3.NF.2.B

Represent a non-unit fraction a/b on a number line by marking off a lengths 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. Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

Enduring Skills:

<u>o</u> : What skill must the student	Mastery: How does the student
emonstrate?	demonstrate the learning of the
	standard?
se fraction strips to find	
actional parts on the number	$\frac{2}{2} + \frac{2}{2} + \frac{2}{2} = \frac{6}{2}$
ne.	5 5 5 5
se visual representations to find	
action names for 1. Use visual	$0 \frac{1}{5} \frac{2}{5} \frac{3}{5} \frac{4}{5} \frac{5}{5} \frac{5}{5} \frac{6}{5} \frac{7}{5} \frac{8}{5} \frac{9}{5} \frac{10}{5} \frac{11}{5} \frac{12}{5}$
epresentations to find fractional	
ames for several wholes that	Demonstrate how they labeled the
re partitioned into place.	number line and explain their
	thinking
abel intervals and points on the	tilliking.
weber lines	
umber lines.	When the numerator and
	denominator are the same, the value
	of the number is one whole. 6/6=1,
	1=8/8, 4/4=1.
o san saa aa	What skill must the student monstrate? e fraction strips to find ctional parts on the number e. e visual representations to find ction names for 1. Use visual presentations to find fractional mes for several wholes that e partitioned into place. pel intervals and points on the mber lines.

MP 4: Model with mathematics.

Coherence KY.2.MD.6 -> KY.3.NF.2 -> KY.4.NF.3

Number Fraction

Standard: 3.NF.3

Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.

3.NF.3.A

Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

- **Know:** What content does the **Do:** What skill must the student Mastery: How does the student demonstrate? demonstrate the learning of the student need to know to standard? demonstrate this standard? Use a number line to find various When the numerator is a multiple (equivalent) fractions that name Rounding of the denominator, the number of the same quantity or point. wholes is the quotient. 12/4=3, Estimation 10/2=5, 6=18/3. Explain their reasoning in building sets of equivalent fractions. For Patterns Decide if the equivalence is example, $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ reasonable. because doubling the number Partition pieces in the whole (denominator) Using a number line, explain if two then will also double the count of Equal area fractions are equivalent. pieces (numerator). Numerator / Denominator Explain patterns they see as they are working with wholes and their Whole is the same size equivalent fractions. in order to compare The smaller the denominator the larger the piece Unit fractions
- MP 3: Construct viable arguments and critique the reasoning of others.

KY.4.NF.1

Coherence KY.3.NF.3 -> KY.4.NF.

Number Fraction

Standard: 3.NF.3

Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.

3.NF.3.B

Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent through writing or drawing.

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

Know: What content does	<u>Do:</u> What skill must the student	Mastery: How does the student
the student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Reasonable answers Rounding	Use visual representations including rectangular and circular are models, fraction bars, and the number line to find various (equivalent) fractions that name the same quantity or point.	
Estimation	Build sets of equivalent fractions from visual models and by recognizing	$\frac{1}{4} = \frac{2}{8} = \frac{4}{16}$
Patterns	patterns.	
Partition	Explain their reasoning in building sets of equivalent fractions. For example, ³	When the numerator and denominator are the same, the value of the number is
Equal area	the number pieces in the whole	one whole. 6/6=1, 1=8/8, 4/4=1.
Numerator	(denominator) then will also double the count of pieces (numerator).	
Denominator	Use visual representations to find fractional names for 1.	
Whole is the same size in		
order to compare		
The smaller the denominator the larger the piece		
Unit fractions		

KY.4.NF.1 Coherence KY.3.NF.3 -> KY.4.NF.5

Number Fraction

Standard: 3.NF.3

Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.

3.NF.3.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

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

Know: What content does the	<u>Do:</u> What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?	Use visual representations including	standard?
	rectangular and circular are models,	
Meaning of fractions	fraction bars, and the number line	Explain how a fraction is equivalent to
	to find various (equivalent)	a whole number using pictures,
Reasonable answers	fractions that name the same quantity or point.	models, and words.
Rounding		
	Build sets of equivalent fractions	When the numerator and denominator
Estimation	recognizing patterns	are the same, the value of the humber is one whole $6/6-1$ $1-8/8$ $4/4-1$
		13 One whole. 0/0-1, 1-0/0, 4/4-1.
Patterns	Explain their reasoning in building	When the denominator is 1, the
Equal area	sets of equivalent fractions. For	fraction represents the wholes. The
	example, ¾ is equivalent to 6/8	number of wholes is the same as the
Numerator	because doubling the number	numerator. 8/1=8, 7=7/1, 3=3/1
	pieces in the whole (denominator)	When the numerator is a multiple of
Denominator	then will also double the count of	the denominator, the number of
	pieces (numerator).	wholes is the quotient. 12/4=3,
Whole is the same size in order		10/2=5, 6=18/3.
to compare		
The smaller the denominator		
the larger the piece		
Unit fractions		
KY 4 NF 1	1	1

Coherence KY.3.NF.3 -> KY.4.NF.5

Number Fraction

Standard: 3.NF.3

Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.

3.NF.3.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 or in the form 3/6 is greater than 3/8 or 3/6 > 3>8

Enduring Skills:

MP 2: Reason abstractly and quantitatively.

MP 3: Construct viable arguments and critique the reasoning of others.

Know: What content does the student need to know to demonstrate this standard Working knowledge of fraction meanings in relation to whole numbers Identify and know meaning of numerator and denominator Know the meaning of comparison symbols.	Do: What skill must the student demonstrate? Use visual representations including rectangular and circular are models, fraction bars, and the number line to find various (equivalent) fractions that name the same quantity or point. Use visual representations to find fractional names for 1. Use visual representations to find fractional names for several wholes that are	Mastery: How does the student demonstrate the learning of the standard?Determine if comparisons of fractions can be made if they refer to the same whole.Compare two fractions with same numerator by reasoning about their size using correct comparison symbols.Compare two fractions with same denominator by reasoning about their size using correct comparison symbols and justify their equivalence.
Know the meaning of comparison symbols.	Use visual representations to find fractional names for 1. Use visual representations to find fractional names for several wholes that are partitioned into pieces.	denominator by reasoning about their size using correct comparison symbols and justify their equivalence. $\frac{3}{6} \text{ is greater than } \frac{3}{8} \text{ or } \frac{3}{6} > \frac{3}{8}$
KY 4	NF 1	

Coherence KY.3.NF.3 -> KY.4.NF.5

Measurement and Data

Standard: 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, e.g., by representing the problem on a number line or clock models.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

MP 4: Model with mathematics.

MP 6: Attend to precision.

Know: What content does the student need to know to demonstrate this standard?	Do: What skill must the student demonstrate?	Mastery: How does the student demonstrate the learning of the standard?
Analog clock/digital clock	Tell and record time to nearest	
Skip counting by 5's		11 12 1
Addition/subtraction	Determine elapsed time by using a number line or a clock model.	10 2 9 3
Number lines		8 4
Second		
Minute		Solve simple word problems by
Hour		using a number line to find the elapsed time.

Coherence KY.2.MD.7 -> KY.3.MD.1 -> KY.4.MD.2

Measurement and Data

Standard: 3.MD.2

Measure and solve problems involving mass and liquid volume.

3.MD.2.A

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (I).

3.MD.2.B

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.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

Wir O. Attend to precision.			
Know: What content does	<u>Do</u> : What skill must the student	Mastery: How does the student	
the student need to know to	demonstrate?	demonstrate the learning of the	
demonstrate this standard?		standard?	
	Estimate and measure liquids to find the	R	
ldentify:	capacity of objects in liters.		
Grams	Estimate and measure the mass of objects		
Kilograms	to the nearest gram or kilogram.	1 kilogram = 1000 grams	
Liter	Choose appropriate units of measure for	44444 A	
Milliliters	specific word problems.		
Estimation	Understand the concept of mass in	1,000 mL = 1 L	
Rounding	relationship to weight.	Solve word problems about	
	Understand the concept when a liquid	metric capacity and mass.	
Visual models of weight and	takes up space it is measured by volume.	See Table 2 in Appendix A	
liquid measurement			
Add/subtract/multiply/divide			

MP 6: Attend to precision.

Coherence KY.2.MD.5 -> KY.3.MD.2 -> KY.4.MD.1

Measurement and Data

Standard: 3.MD.3

Investigate questions involving categorical data.

3.MD.3.A

Identify a statistical question focused on categorical data and gather data

3.MD.3.B

Create a scaled pictograph and a scaled bar graph to represent a data set (using technology or by hand).

3.MD.3.C

Make observations form the graph about the questions posed, including "how many more" and "how many less" questions.

Enduring Skills:

MP 3: Construct viable arguments and critique the reasoning of others.

MP 5: Use appropriate tools strategically.

MP 6: Attend to precision.

Know: What content does the	Do: What skill must the student	Mastery: How does	the stude	nt demonstrate	2
student need to know to	demonstrate?	the learning of the s	tandard?		
demonstrate this standard?		Favorite Colors	Fa	avorite Pets	
		20 50 15	Cat	****	
Types of graphs	Identify scale.	o 10	Dog	**	
Types of graphs		A state of the sta	Hamster	***	
Horizontal Vertical tick mark Key line plot	Collect and categorize data to display graphically. Draw a scaled picture graph to represent a data set with several categories. Draw a scaled bar graph to represent a data set with several categories.	Solve one-and two s and "how many less information present Analyze and interpri graphs they create. question of interest each classmate have a bar graph (each so might represent two	Each & stands step "how s" problem ted in scal et data on Students : (how man e), gather guare in th o pets).	for 2 votes. many more" ns using ed bar graphs. n picture and bar select a ny pets does data and create ne bar graph	ar e
Ddld					

Coherence KY.2.MD.10 -> KY.3.MD.3

Measurement and Data

Standard: 3.MD.4 Investigate questions involving numerical data.

3.MD.4.A

Identify a statistical question focused on numerical data

3.MD.4.B

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.

3.MD.4.C

Show the data by making a dot plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, and quarters.

3.MD.4.D

Make observations from the graph about the question posed, including questions about the shape of the data and compare responses.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

MP 3: Construct viable arguments and critique the reasoning of others.

MP 6: Attend to precision.

Know: What content does the student need to know to demonstrate this standard?	<u>Do</u> : What skill must the student demonstrate?	<u>Mastery:</u> How does the student demonstrate the learning of the standard?
Ruler	Measure objects to the nearest whole, half, and quarter inch.	\cdot
Inch		measurements in inches
quarter inch	Use statistical questions to identify and gather data.	Interpret the data on a dot plot by correctly answering questions about
Half inch		the data.
dot plot		Create a dot plot to display the data of the objects they measured to the nearest $\frac{1}{2}$ or $\frac{1}{4}$.

Coherence KY.2.MD.9 -> KY.3.MD.4 -> KY.4.MD.4

Measurement and Data

Standard: 3.MD.5

Recognize area as an attribute of plane figures and understand concepts of area measurement.

Clarification 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.

Clarification 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.

Enduring Skills:

MP 5: Use appropriate tools strategically.

Know: What content does the student need to know to demonstrate this standard?	<u>Do</u>: What skill must the student demonstrate?	Mastery: How does the student demonstrate the learning of the standard?
Attribute	Use appropriate measurement vocabulary to describe area of	5 cm
Two-dimensional figure	measurement with square units.	10 9 8 7 6 2 cm
Terminology-measuring, covering, area, square unit, plane figure, gap, overlap, square inch Multiplication facts	Use manipulatives and multiplication arrays to determine the area of a regular square or rectangle.	Recognize area as an attribute of plane figures and understand concepts of area measurement.
Arrays		of a figure.
		Determine the area of plane figures using square units.
		2 square units
		1 square unit

Measurement and Data

Standard: 3.MD.6

Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Enduring Skills:

MP 5: Use appropriate tools strategically.

MP 6: Attend to precision.

Know: What content does the	<u>Do</u> : What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Attribute	Use grid paper of varying square units to count the number of	Solve for area using units of measurement including answering in
Two-dimensional figure	squares in a figure.	square units.
Terminology-measuring, covering, area, square unit, plane figure, gap, overlap, square inch	Use manipulatives and multiplication arrays to determine	1 inch
Multiplication facts	the area of a regular square or rectangle including units of	1 cm 1 square centimeter 1 square inch (1 sq. cm or 1 cm ²) (1 sq. in or 1 in ²)
Arrays	measurement.	1 cm 1 inch

Coherence KY.2.G.2 -> KY.3.MD.6 -> KY.5.MD.4

Measurement and Data

Standard: 3.MD.7

Relate area to the operations of multiplication and addition.

3.MD.7.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.

3.MD.7.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.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

MP 8: Look for and express regularity in repeated reasoning.



Coherence KY.3.MD.7 -> KY.4.MD.3 -> KY.5.MD.5

Measurement and Data

Standard: 3.MD.7

Relate area to the operations of multiplication and addition.

3.MD.7.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 $\times b$ and a $\times c$. Use area models to represent the distributive property in mathematical reasoning.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

MP 8: Look for and express regularity in repeated reasoning.

Know: What content does the student need to know to demonstrate this standard?	Do : What skill must the student demonstrate?	Mastery: How does the student demonstrate the learning of the standard?
Attribute	Apply the technique of decomposing a rectangular figure,	6 cm
Two-dimensional figure	then adding the areas of the decomposed figures to find the	7 cm 4 cm
Terminology-measuring, covering, area, square unit, plane figure, gap, overlap, square inch	total area.	3 cm
Multiplication facts		
Arrays		Solve problems including word
Addition		using various strategies.
Length and width		

Coherence KY.3.MD.7 -> KY.4.MD.3 -> KY.5.MD.5

Measurement and Data

Standard: 3.MD.7

Relate area to the operations of multiplication and addition.

3.MD.7.D

Recognize area as additive. Find areas of figures that can be decomposed into non-overlapping rectangles by adding areas of the non-overlapping parts, applying this technique to solve real world problems.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them. MP 8: Look for and express regularity in repeated reasoning.

Know: What content does the student need to know to demonstrate this standard?	<u>Do</u> : What skill must the student demonstrate?	Mastery: How does the student demonstrate the learning of the standard?
Attribute		2 2
Two-dimensional figure	Apply the technique of	$ \begin{array}{c} 3 \\ 4 \\ 2 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 2 \end{array} \begin{array}{c} 2 \\ 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 2 \\ 6 \end{array} \begin{array}{c} 2 \\ 2 \\ 2 \end{array} \begin{array}{c} 2 \\ 2 \end{array} \begin{array}{c} 2 \\ 2 \\ 2 \end{array} \begin{array}{c} 2 \\ 2 \end{array} \begin{array}{c} 2 \\ 2 \\ 2 \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \\ 2 \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \\ 2 \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} \end{array} \end{array} \end{array} \end{array} \end{array} \begin{array}{c} 2 \end{array} $
Terminology-measuring, covering, area, square unit, plane figure, gap, overlap, square inch	decomposing a rectangular figure, then adding the areas of the decomposed figures to find the total area.	Tiles in repeated rows to fill the rectangle, they notice each row has the same number of tiles and the number of tiles that will fill a rectangle can be written as [number of tiles in one row] x
Multiplication facts		[number of rows]
Arrays		
Addition		
Length and width		

Coherence KY.3.MD.7 -> KY.4.MD.3 -> KY.5.MD.5

Measurement and Data

Standard: 3.MD.8

Solve real world and mathematical problems involving perimeters of polygons.

3.MD.8.A

Find the perimeter given the side lengths of a polygon.

3.MD.8.B

Find unknown side lengths, given the perimeter and some lengths.

3.MD.8.C

Draw rectangles with the same perimeter and different areas or with the same area and different perimeters.

Enduring Skills:

MP 1: Make sense of problems and persevere in solving them.

MP 4: Model with mathematics.

Know: What content does the	Do: What skill must the student	Mastery: How does the student
student need to know to	demonstrate?	demonstrate the learning of the
demonstrate this standard?		standard?
Polygons	Measure to find perimeter shapes on a geoboard.	
Area		Recognize perimeter is a measure
Perimeter	Measure to find the perimeter of real world objects.	of length and see perimeters of polygons as a collection of side lengths added together to form
Multiplication	Draw a picture or diagram to	the perimeter. Therefore, they see
Division	explain how to find the perimeter of an unknown side.	if a side length is missing, it is like a missing addend problem and write an equation or draw a bar diagram to solve for the missing value
Rectangles	Use the term perimeter	
Arrays	appropriately and know the difference between area and perimeter.	Recognize they can use a given perimeter (such as 16 inches) and form different rectangles (such as 4 x 4, 3 x 5, 2 x 6, 1 x 7) and that these rectangles have different areas.

Coherence KY.3.MD.8 -> KY.4.MD.3

Geometry

Standard: 3.G.1

Classify polygons by attributes.

3.G.1.A

Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons and hexagons).

3.G.1.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.

3.G.1.C

Identify shapes that do not belong to a given category or subcategory.

Enduring Skills:

MP 6: Attend to precision.

MP 7: Look for and make use of structure.

Know: What content	Do: What skill must the student	Mastery: How does the student demonstrate
does the student	demonstrate?	the learning of the standard?
need to know to		
demonstrate this	Identify and define rhombuses,	
standard?	rectangles, and squares as examples	Variety and and a second and as second and a
	of quadrilaterals based on their	
Polygons and their	attributes.	Recting services and the service service service service service services and the service serv
attributes (sides,		
vertices, angles)	Describe, analyze, and compare	Plane Shape Organizer
	properties of two-dimensional	- dami dipanditation - dami dipanditation - dami penditation - dami penditation - Mangle - Second -
Quadrilateral	shapes.	
classifications		
	Compare and classify shapes by	Categorize/Classify shapes by various
	attributes, sides and angles.	attributes.
	Draw examples of guadrilaterals that do	
	and do not belong to any of the	Explain why a given shape does/does not
	subcategories.	belong in identified group.

Geometry

Standard: 3.G.2

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

Clarification: Partitioned parts should be halves, thirds, fourths, sixths, or eighths. For example, students partition a shape into six parts with equal areas and describe the area of each part as 1/6 of the area of the shape.

Enduring Skills:

MP 2: Reason abstractly and quantitatively. MP 5: Use appropriate tools strategically.

Know: What content does	<u>Do</u>: What skill must the	Mastery: How does the
the student need to know to	student demonstrate?	student demonstrate the
demonstrate this standard?		learning of the standard?
	Know that shapes can be	
Plane Shapes	partitioned into equal areas.	Which model shows $\frac{2}{6}$ of the whole figure shaded?
Basic Fractions Unit Fraction	Describe the area of each part as a fractional part of the whole.	 Partitioned parts should be halves, thirds, fourths, sixths, eighths. Relate fractions to geometry by expressing the area of part of a shape as a unit fraction of the whole. (See 3rd grade introduction).

KY.3.NF.1 Coherence KY.2.G.3 -> KY.3.G.2