

**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
<p align="center">Mathematical Process Standards</p> <p>The student uses mathematical processes to acquire and demonstrate mathematical understanding.</p>	Problem Solving								<p align="center">Underlying Processes and Mathematical Tools</p> <p>These skills will not be listed under a separate reporting category. Instead, they will be incorporated into at least 75% of the test questions in reporting categories 1–5 and will be identified along with content standards.</p>
		<p>MATH.K.1A Apply mathematics to problems arising in everyday life, society, and the workplace.</p>	<p>MATH.1.1A Apply mathematics to problems arising in everyday life, society, and the workplace.</p>	<p>MATH.2.1A Apply mathematics to problems arising in everyday life, society, and the workplace.</p>	<p>PS MATH.3.14A Identify the mathematics in everyday situations.</p>	<p>PS MATH.4.14A Identify the mathematics in everyday situations.</p>	<p>PS MATH.5.14A Identify the mathematics in everyday situations.</p>		
		<p>MATH.K.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p>	<p>MATH.1.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p>	<p>MATH.2.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p>	<p>PS MATH.3.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.</p>	<p>PS MATH.4.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.</p>	<p>PS MATH.5.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.</p>		
					<p>PS MATH.3.14C Select or develop an appropriate problem-solving plan or strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out, making a table, working a simpler problem, or working backwards to solve a problem.</p>	<p>PS MATH.4.14C Select or develop an appropriate problem-solving plan or strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out, making a table, working a simpler problem, or working backwards to solve a problem.</p>	<p>PS MATH.5.14C Select or develop an appropriate problem-solving plan or strategy including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.</p>		
		<p>MATH.K.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p>	<p>MATH.1.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p>	<p>MATH.2.1C Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p>	<p>PS MATH.3.14D Use tools such as real objects, manipulatives, and technology to solve problems.</p>	<p>PS MATH.4.14D Use tools such as real objects, manipulatives, and technology to solve problems.</p>	<p>PS MATH.5.14D Use tools such as real objects, manipulatives, and technology to solve problems.</p>		
		<p>MATH.K.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p>	<p>MATH.1.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p>	<p>MATH.2.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p>	<p>PS MATH.3.15A Explain and record observations using objects, words, pictures, numbers, and technology.</p>	<p>PS MATH.4.15A Explain and record observations using objects, words, pictures, numbers, and technology.</p>	<p>PS MATH.5.15A Explain and record observations using objects, words, pictures, numbers, and technology.</p>		
		<p>MATH.K.1E Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p>MATH.1.1E Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p>MATH.2.1E Create and use representations to organize, record, and communicate mathematical ideas.</p>	<p>PS MATH.3.15B Relate informal language to mathematical language and symbols.</p>	<p>PS MATH.4.15B Relate informal language to mathematical language and symbols.</p>	<p>PS MATH.5.15B Relate informal language to mathematical language and symbols.</p>		
	<p>MATH.K.1F Analyze mathematical relationships to connect and communicate mathematical ideas.</p>	<p>MATH.1.1F Analyze mathematical relationships to connect and communicate mathematical ideas.</p>	<p>MATH.2.1F Analyze mathematical relationships to connect and communicate mathematical ideas.</p>	<p>PS MATH.3.16A Make generalizations from patterns or sets of examples and non-examples.</p>	<p>PS MATH.4.16A Make generalizations from patterns or sets of examples and non-examples.</p>	<p>PS MATH.5.16A Make generalizations from patterns or sets of examples and non-examples.</p>			



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Problem Solving Continued							
		MATH.K.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	MATH.1.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	MATH.2.1G Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	^{PS} MATH.3.16B Justify why an answer is reasonable and explain the solution process.	^{PS} MATH.4.16B Justify why an answer is reasonable and explain the solution process.	^{PS} MATH.5.16B Justify why an answer is reasonable and explain the solution process.	
	Numeracy and Number Sense							
Number and Operations The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value.	V.A.2. Child uses words to rote count from 1 to 30.	MATH.K.2A Count forward and backward to at least 20 with and without objects.	See MATH.1.5A					
	V.A.5. Child counts up to 10 items, and demonstrates that the last count indicates how many items were counted.							
	V.A.8. Child verbally identifies, without counting, the number of objects from 1 to 5. See V.A.2 and V.A.5.							
	V.A.3. Child counts 1-10 items, with one count per item.	MATH.K.2C Count a set of objects up to at least 20 and demonstrate that the last number said tells the number of objects in the set regardless of their arrangement or order.						
	V.A.4. Child demonstrates that the order of the counting sequence is always the same, regardless of what is counted.							
		MATH.K.2D Recognize instantly the quantity of a small group of objects in organized and random arrangements.	MATH.1.2A Recognize instantly the quantity of structured arrangements.					
		MATH.K.2F Generate a number that is one more than or one less than another number up to at least 20.	See MATH.1.5C	See MATH.2.7B				



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

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Number and Operations The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value.	Compose and Decompose Numbers											
		MATH.K.2I Compose and Decompose numbers up to 10 with objects and pictures.	See MATH.1.3C	MATH.2.2A Use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones.								
			MATH.1.2B Use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.									
Number and Operations The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value.	Place Value								Reporting Category 1 – Number, Operation, and Quantitative Reasoning The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.			
	See V.A.3. and V.A.5.	MATH.K.2B Read, write, and represent whole numbers from 0 to at least 20 with and without objects or pictures.	MATH.1.2C Use objects, pictures, and expanded and standard forms to represent numbers up to 120.	MATH.2.2B Use standard, word, and expanded forms to represent numbers up to 1,200.	PS-MATH.3.1A Use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999 <i>in standard, expanded, and written forms</i>	PS-MATH.4.1A Use place value to read (<i>in symbols and words</i>), write, compare, and order whole numbers through 999,999,999 <i>in standard, expanded, and written forms.</i>						
	V.A.6. Child demonstrates understanding that when counting, the items can be chosen in any order.											
	V.A.8. Child verbally identifies, without counting, the number of objects from 1 to 5.											
V.A.9. Child recognizes one-digit numerals, 0-9.												



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008		
<p align="center">Number and Operations</p> <p>The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value.</p>	Comparing and Ordering							<p align="center">Reporting Category 1 – Number, Operation, and Quantitative Reasoning</p> <p>The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.</p>		
	V.A.1. Child knows that objects, or parts of an object, can be counted.	MATH.K.2E Generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20.	MATH.1.2D Generate a number that is greater than or less than a given whole number up to 120.	MATH.2.2C Generate a number that is greater than or less than a given whole number up to 1,200.	ⓂMATH.3.1B Use place value to compare and order whole numbers through 9,999 <i>moving from concrete models and pictorial representations to the symbolic level.</i>	ⓂMATH.4.1B Use place value to read (<i>in symbols and words</i>), write, compare, and order decimals involving tenths and hundredths, including money, using concrete objects and pictorial models.	ⓂMATH.5.1B Use place value to read, write, compare, and order decimals through the thousandths place <i>moving from concrete models and pictorial representations to the symbolic level.</i>			
	See V.A.6.	MATH.K.2G Compare sets of objects up to at least 20 in each set using comparative language.	MATH.1.2E Use place value to compare whole numbers up to 120 using comparative language.	MATH.2.2D Use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (>, <, or =).						
	See V.A.8.	MATH.K.2H Use comparative language to describe two numbers up to 20 presented as written numerals.	MATH.1.2F Order whole numbers up to 120 using place value and open number lines.							
			MATH.1.2G Represent the comparison of two numbers to 100 using the symbols >, <, or =.	Number Lines						
				MATH.2.2E Locate the position of a given whole number on an open number line.	ⓂMATH.3.10 Locate and name points on a number line using whole numbers and fractions, including halves and fourths.	ⓂMATH.4.10 Locate and name points on a number line using whole numbers, fractions such as halves and fourths, and decimals such as tenths.		<p align="center">Reporting Category 4 – Measurement</p> <p>The student will demonstrate an understanding of the concepts and uses of measurement.</p>		
				MATH.2.2F Name the whole number that corresponds to a specific point on a number line.						
				See MATH.2.9C						
	<p align="center">Number and Operations</p> <p>The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the need for monetary transactions.</p>	Numbers and Money								
			MATH.K.4 Identify U.S. coins by name, including pennies, nickels, dimes, and quarters.	MATH.1.4A Identify U.S. coins, including pennies, nickels, dimes, and quarters, by value and describe the relationships among them.	MATH.2.5B Use the cent symbol, dollar sign, and the decimal point to name the value of a collection of coins.					
		MATH.1.4B Write a number with the cent symbol to describe the value of a coin.								



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
Number and Operations (Money)	Numbers and Money Continued								Reporting Category 1 – Number, Operation, and Quantitative Reasoning The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
			MATH.1.4C Use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes.	MATH.2.5A Determine the value of a collection of coins up to one dollar.	ⓈMATH.3.1C Determine the value of a collection of coins and bills.	See ⓈMATH.4.1B	See ⓈMATH.5.1B		
Number and Operations The student applies mathematical process standards to recognize and represent fractional units and communicates how they are used to name parts of a whole.	Fractions			Constructing Fractions					
	V.B.3. Child uses informal strategies to share or divide up to 10 items equally.		See MATH.1.6G	MATH.2.3A Partition objects into equal parts and name the parts, including halves, fourths, and eighths, using words.	MATH.3.2A Construct concrete models of fractions of whole objects or sets of objects with denominators of 12 or less using a variety of manipulatives.				
			See MATH.1.6H	MATH.2.3D Identify examples and non-examples of halves, fourths, and eighths.	ⓈMATH.3.2C Use fraction names and symbols to describe fractional parts of whole objects or sets of objects				
				MATH.2.3B Explain that the more fractional parts used to make a whole, the smaller the part; and the fewer the fractional parts, the larger the part.					
				2.3C Use concrete models to count fractional parts beyond one whole using words and recognize how many parts it takes to equal one whole.					
	Equivalent Fractions								
					MATH.3.2D Construct concrete models of equivalent fractions for fractional parts of whole objects with a variety of manipulatives.	ⓈMATH.4.2A Use concrete objects and pictorial models to generate equivalent fractions.	ⓈMATH.5.2A Generate a fraction equivalent to a given fraction such as 1/2 and 3/6 or 4/12 and 1/3 using various strategies including concrete objects, pictorial models, and patterns to generalize a rule for the process.		



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Comparing Fractions							
					MATH.3.2B Compare fractional parts of whole objects or sets of objects in a problem situation using concrete models.	ⓈMATH.4.2C Compare and order fractions using concrete objects and pictorial models <i>for whole objects and sets of objects.</i>	ⓈMATH.5.2C Compare two fractional quantities in problem-solving situations using a variety of methods, including common denominators, <i>concrete or pictorial models, and benchmark fractions.</i>	Reporting Category 1 – Number, Operation, and Quantitative Reasoning The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
					See MATH.3.2A, Ⓢ3.2C	ⓈMATH.4.2B Model fraction quantities greater than one using concrete objects and pictorial models, <i>and record the value.</i>	ⓈMATH.5.2B Generate a mixed number equivalent to a given improper fraction or generate an improper fraction equivalent to a given mixed number <i>using various strategies including concrete objects, pictorial models, and patterns to generalize a rule for the process.</i>	
	Fractions to Decimals							
				See ⓈMATH.3.1C	ⓈMATH.4.2D Relate decimals to fractions that name tenths and hundredths using concrete objects and pictorial models.	ⓈMATH.5.2D Use models to relate decimals to fractions that name tenths, hundredths, and thousandths <i>with models such as base-ten blocks, fraction bars, and paper grids.</i>		
Number and Operations (Addition and Subtraction)	Modeling Operations							
	V.B.1. Child uses concrete models or makes a verbal word problem for adding up to 5 objects. V.B.2. Child uses concrete models or makes a verbal word problem for subtracting 1-5 objects from a set.	MATH.K.3A Model the action of joining to represent addition and the action of separating to represent subtraction.	MATH.1.3A Use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99.	See MATH.2.7C	ⓈMATH.3.3A Model addition and subtraction using pictures, words, and numbers.	ⓈMATH.4.3B Add and subtract decimals to the hundredths place using concrete objects and pictorial models.	ⓈMATH.5.3E Model situations using addition and/or subtraction involving fractions with like denominators using concrete objects, pictures, words, and numbers.	



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
	Modeling Operations Continued								
Number and Operations The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction.	(See V.B.1 and V.B.2)	See MATH.K.3A	MATH.1.3B Use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as $2 + 4 = []$; $3 + [] = 7$; and $5 = [] - 3$.					Reporting Category 1 – Number, Operation, and Quantitative Reasoning The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.	
			MATH.1.3 C Compose 10 with two or more addends with and without concrete objects.						
Number and Operations The student applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares.			See MATH.1.5B	MATH.2.6A Model, create, and describe contextual multiplication situations in which equivalent sets of concrete objects are joined.		©MATH.4.4A Model factors and products using arrays and area models.	©MATH.5.3D Identify common factors of a set of whole numbers <i>using a variety of strategies and manipulatives.</i>		
						©MATH.5.5B Identify prime and composite numbers using concrete objects, pictorial models, and patterns in factor pairs.			
				MATH.2.6B Model, create, and describe contextual division situations in which a set of concrete objects is separated into equivalent sets.	®MATH.3.4C Use models to solve division problems and use number sentences to record the solutions <i>for contexts involving sharing equally and measuring out.</i>	©MATH.4.4B Represent multiplication and division situations in picture, word, and number form.	See ®MATH.5.3B ®5.3C		
	Recall and Apply								
Number and Operations The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems.			MATH.1.3D Apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10.	MATH.2.4A Recall basic facts to add and subtract within 20 with automaticity.	©MATH.3.4A Learn and apply multiplication facts through 12 by 12 using concrete models and objects (<i>array/area and grouping models</i>).	©MATH.4.4C Recall and apply multiplication facts through 12 x 12.	(See ®MATH.5.3B)		
	Solving Problems with Addition, Subtraction, Multiplication, and Division								
	(See V.B.1 and V.B.2)			MATH.2.4B Add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations.	®MATH.3.3B Select addition or subtraction and use the operation to solve problems involving whole numbers through 999 <i>using a variety of strategies.</i>	©MATH.4.3A Use addition and subtraction to solve problems involving whole numbers <i>using a variety of strategies.</i>	®MATH.5.3A Use addition and subtraction to solve problems involving whole numbers and decimals <i>using a variety of strategies.</i>		



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Solving Problems with Addition, Subtraction, Multiplication, and Division Continued							
Number and Operations The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems.	(See V.B.1 and V.B.2)	MATH.K.3B Solve word problems using objects and drawings to find sums up to 10 and differences within 10.	MATH.1.3F Generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20.	MATH.2.4C Solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms.	(See ®MATH.3.3B)	(See ©MATH.4.3A)	(See ®MATH.5.3A)	Reporting Category 1 – Number, Operation, and Quantitative Reasoning The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
				MATH.2.4D Generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000.				
		MATH.K.3C Explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences.	MATH.1.3E Explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences.					
				See MATH.2.6A	®MATH.3.4B Solve and record multiplication problems (up to two digits times one digit).	®MATH.4.4D Use multiplication to solve problems (no more than two digits times two digits without technology) <i>applying array/area models to multiplication algorithms.</i>	®MATH.5.3B Use multiplication to solve problems involving whole numbers (no more than three-digits times two-digits without technology) <i>applying array/area models to multiplication algorithms.</i>	
				See MATH.2.6B	See MATH.3.4C	®MATH.4.4E Use division to solve problems (no more than one-digit divisors and three-digit dividends without technology) <i>for sharing equally and measuring out contexts applying models to division algorithms.</i>	®MATH.5.3C Use division to solve problems involving whole numbers (no more than two-digit divisors and three-digit dividends without technology), including interpreting the remainder <i>within a given context for sharing equally and measuring out contexts applying models to division algorithms.</i>	



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
	Estimation								
					ⓈMATH.3.5A Round whole numbers to the nearest ten or hundred to approximate reasonable results in problem situations.	ⓈMATH.4.5A Round whole numbers to the nearest ten, hundred, or thousand to approximate reasonable results in problem situations.	ⓈMATH.5.4A Use strategies, including rounding and compatible numbers to estimate solutions to addition, subtraction, multiplication, and division problems.	Reporting Category 1 – Number, Operation, and Quantitative Reasoning	
					ⓈMATH.3.5B Use strategies including rounding and compatible numbers to estimate solutions to addition and subtraction problems.	ⓈMATH.4.5B Use strategies including rounding and compatible numbers to estimate solutions to multiplication and division problems.			
Algebraic Reasoning The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships.	Patterns and Generalizations								
	(See V.A.2)	MATH.K.5 Recite numbers up to at least 100 by ones and tens beginning with any given number.	MATH.1.5A Recite numbers forward and backward from any given number between 1 and 120.						
			MATH.1.5C Use relationships to determine the number that is 10 more and 10 less than a given number up to 120.	MATH.2.7B Use an understanding of place value to determine the number that is 10 or 100 more or less than a given number up to 1,200.					
	(See V.B.1 and V.B.2)		MATH.1.5D Represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences.	MATH.2.7C Represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem.					
		MATH.1.5E Understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s).							



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

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Algebraic Reasoning The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships.	Patterns and Generalizations Continued								Reporting Category 2 – Patterns, Relationships, and Algebraic Reasoning The student will demonstrate an understanding of patterns, relationships, and algebraic reasoning.	
			MATH.1.5F Determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation.							
			MATH.1.5G Apply properties of operations to add and subtract two or three numbers.							
	Algebraic Relationships and Patterns				Strategies and Fact Families					
	V.E.3. Child recognizes and creates patterns.		MATH.1.5B Skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set.	MATH.2.7A Determine whether a number up to 40 is even or odd using pairings of objects to represent the number.	ⓈMATH.3.6B Identify patterns in multiplication facts using concrete objects, pictorial models, or technology.	ⓈMATH.4.6B Use patterns to multiply by 10 and 100.				
			MATH.2.5C Use patterns and relationships to develop strategies to remember basic addition and subtraction facts. Determine patterns in related addition and subtraction number sentences (including fact families) such as $8 + 9 = 17$, $9 + 8 = 17$, $17 - 8 = 9$, and $17 - 9 = 8$.	ⓈMATH.3.6C Identify patterns in related multiplication and division sentences (fact families) such as $2 \times 3 = 6$, $3 \times 2 = 6$, $6 \div 2 = 3$, $6 \div 3 = 2$.	ⓈMATH.4.6A Use patterns and relationships to develop strategies to remember basic multiplication and division facts (such as the patterns in related multiplication and division number sentences (fact families) such as $9 \times 9 = 81$ and $81 \div 9 = 9$).					
Expressing Relationships and Making Predictions										
				ⓈMATH.3.6A Identify and extend whole-number and geometric patterns to make predictions and solve problems <i>including determining the missing number/term.</i> ⓈMATH.3.7A Generate a table of paired numbers based on a real-life situation such as insects and legs.	ⓇMATH.4.7 Describe the relationship between two sets of related data such as ordered pairs in a table, <i>extend the pattern, and state the rule for non-consecutive related number pairs.</i>	ⓇMATH.5.5A Describe the relationship between sets of data in graphic organizers such as lists, tables, charts, and diagrams, <i>extend the pattern, and state the rule for non-consecutive related number pairs.</i>				



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K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Expressing Relationships and Making Predictions Continued							
					ⓂMATH.3.7B Identify and describe patterns in a table of related number pairs based on a meaningful problem and extend the table.	See ⓂMATH.4.7	See ⓂMATH.5.5A	Reporting Category 2 – Patterns, Relationships, and Algebraic Reasoning
							ⓂMATH.5.6A Select from and use diagrams and equations such as $y = 5 + 3$ to represent meaningful problem situations <i>involving addition, subtraction, multiplication, or division</i> .	
	Geometric Language							
Geometry and Measurement The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties.	V.C.1. Child names common shapes.	MATH.K.6A Identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles.	MATH.1.6D Identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons and describe their attributes using formal geometric language.	See MATH.2.8A	ⓂMATH.3.8 Identify, classify, and describe two- and three-dimensional geometric figures by their attributes. The student compares two-dimensional figures, three-dimensional figures, or both by their attributes using formal geometry vocabulary.	ⓂMATH.4.8C Use essential attributes to define two- and three-dimensional geometric figures <i>such as number of edges, number of faces, number of vertices, types of angles, and shapes of faces and base</i> .	ⓂMATH.5.7A Identify essential attributes including parallel, perpendicular, and congruent parts of two- and three-dimensional geometric figures <i>and use formal geometric vocabulary to describe and compare given figures</i> .	Reporting Category 3 - Geometry and Spatial Reasoning The student will demonstrate an understanding of geometry and spatial reasoning.
		MATH.K.6D Identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably.						
	MATH.K.6B Identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world.	MATH.1.6E Identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language.						
	MATH.K.6C Identify two-dimensional components of three-dimensional objects.	MATH.1.6B Distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape.						
	MATH.K.6E Classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size.	MATH.1.6A Classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language.	See MATH.2.8A					



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
Geometry and Measurement The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties.	Geometric Language Continued								
	V.C.2. Child creates shapes.	MATH.K.6F Create two-dimensional shapes using a variety of materials and drawings.	MATH.1.6C Create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons.	MATH.2.8A Create two-dimensional shapes based on given attributes, including number of sides and vertices.					Reporting Category 3 - Geometry and Spatial Reasoning The student will demonstrate an understanding of geometry and spatial reasoning
		MATH.1.6F Compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible.	MATH.2.8D Compose two-dimensional shapes and three-dimensional solids with given properties or attributes.						
						Ⓢ MATH.4.8A Identify and describe right, acute, and obtuse angles.			
						Ⓢ MATH.4.8B Identify and describe parallel and intersecting (including perpendicular) lines using concrete objects, pictorial models, and formal geometry vocabulary.			
	Geometric Transformations								
	(See V.B.3 and V.C.2)		MATH.1.6G Partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words.	MATH.2.8E Decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts.	MATH.3.9B Create two-dimensional figures with lines of symmetry using concrete models and technology.	Ⓢ MATH.4.9C Use reflections to verify that a shape has symmetry and describe the two halves of a shape for each line of symmetry.			
			MATH.1.6H Identify examples and non-examples of halves and fourths.		Ⓢ MATH.3.9C Identify lines of symmetry in two-dimensional geometric figures.				
					Ⓢ MATH.3.9A Identify congruent two-dimensional figures in the same/different orientation.	MATH.4.9A Demonstrate translations, reflections, and rotations using concrete models and formal geometric vocabulary.	Ⓢ MATH.5.9A Locate and name points on a coordinate grid using ordered pairs of whole numbers.		
							Ⓡ MATH.5.8A Sketch the results of translations, rotations, and reflections on a Quadrant I coordinate grid and name points using ordered pairs.		



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Geometric Transformations Continued							
						®MATH.4.9B Use translations, reflections, and rotations to verify that two shapes are congruent.	ⓈMATH.5.8B Identify the transformation that generates one figure from the other when given two congruent figures on a Quadrant I coordinate grid.	Reporting Category 3 - Geometry and Spatial Reasoning
	Measuring							
Geometry and Measurement The student applies mathematical process standards to select and use units to describe length, area, and time.	V.D.1. Child recognizes and compares heights or lengths of people or objects.	MATH.K.7A Give an example of a measurable attribute of a given object, including length, capacity, and weight.	MATH.1.7A Use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement.	MATH.2.9A Find the length of objects using concrete models for standard units of length.	ⓈMATH.3.11A Use linear measurement tools to estimate and measure lengths using standard units <i>in customary system and SI (metric) system.</i>	®MATH.4.11A Estimate and use measurement tools to determine length (including perimeter), area, capacity, and weight/mass using standard units SI (metric) and customary.	ⓈMATH.5.10B Connect <i>concrete models and pictorial representations</i> for perimeter, area, and volume with their respective formulas.	Reporting Category 4 – Measurement The student will demonstrate an understanding of the concepts and uses of measurement.
	V.D.2. Child recognizes how much can be placed within an object.							
			MATH.1.7B Illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other.	MATH. 2.9B Describe the inverse relationship between the size of the unit and the number of units needed to equal the length of an object.				
	V.D.3. Child informally recognizes and compares weights of objects or people.	MATH.K.7B Compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference.	MATH.1.7C Measure the same object/distance with units of two different lengths and describe how and why the measurements differ.					
			MATH.1.7D Describe a length to the nearest whole unit using a number and a unit.	MATH.2.9C Represent whole numbers as distances from any given location on a number line.				
				MATH.2.9D Determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes.				
				MATH.2.9E Determine a solution to a problem involving length, including estimating lengths.				



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008	
Geometry and Measurement	Measuring Continued								The student will demonstrate an understanding of the concepts and uses of measurement. Reporting Category 4 – Measurement
				MATH.2.9F Use concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit.	ⓈMATH.3.11C Use concrete and pictorial models of square units to determine the area of two-dimensional surfaces.		ⓇMATH.5.10C Select and use appropriate units and formulas to measure length, perimeter, area, and volume <i>in customary system and SI (metric) system.</i>		
(See V.D.2)	(See MATH.K.7A)				MATH.3.11E Identify concrete models that approximate standard units for capacity and use them to measure capacity <i>in the customary system and SI (metric) system.</i>				
					MATH.3.11D Identify concrete models that approximate standard units of weight/mass and use them to measure weight/mass <i>in the customary system and SI (metric) system.</i>	ⓈMATH.4.11E Explain the difference between weight and mass.			
					MATH.3.11F Use concrete models that approximate cubic units to determine the volume of a given container or other three-dimensional geometric figure <i>in the customary system and SI (metric) system.</i>	ⓈMATH.4.11C Use concrete models of standard cubic units to measure volume <i>in customary system and SI (metric) system.</i>			
						ⓈMATH.4.11D Estimate volume in cubic units.			
Measuring Conversions									
						ⓈMATH.4.11B Perform simple conversions between different units of length, between different units of capacity, and between different units of weight within the customary measurement system.	ⓈMATH.5.10A Perform simple conversions within the same measurement system (SI (metric) or customary).		



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Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008		
Geometry and Measurement The student applies mathematical process standards to select and use units to describe length, area, and time.	Time and Temperature								Reporting Category 4 – Measurement The student will demonstrate an understanding of the concepts and uses of measurement.	
	V.D.4. Child uses language to describe concepts associated with the passing of time.		MATH.1.7E Tell time to the hour and half hour using analog and digital clocks.	MATH.2.9G Read and write time to the nearest one-minute increment using analog and digital clocks and distinguish between a.m. and p.m.	ⓈMATH.3.12A Use a thermometer to measure temperature (<i>in degrees Fahrenheit</i>).	ⓈMATH.4.12A Use a thermometer to measure temperature and changes in temperature (<i>in degrees Fahrenheit and Celsius</i>).	ⓈMATH.5.11A Solve problems involving changes in temperature. (<i>in degrees Fahrenheit and Celsius</i>).			
Data Analysis The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems.	Displaying and Interpreting Data								Reporting Category 5 – Probability and Statistics The student will demonstrate an understanding of probability and statistics.	
	V.E.2. Child collects data and organizes it in a graphic representation.	MATH.K.8A Collect, sort, and organize data into two or three categories.	MATH.1.8A Collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts.	MATH.2.10A Explain that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category.	ⓈMATH.3.13A Collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data.	ⓂMATH.4.13B Interpret bar graphs <i>using verbal and numerical data to summarize and answer questions</i> .	See ⓈMATH.5.9A			
		MATH.K.8B Use data to create real-object and picture graphs.	MATH.1.8B Use data to create picture and bar-type graphs.	MATH.2.10B Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more.				ⓈMATH.5.13A Use tables of related number pairs to make line graphs.		
		MATH.K.8C Draw conclusions from real-object and picture graphs.	MATH.1.8C Draw conclusions and generate and answer questions using information from picture and bar-type graphs.	MATH.2.10C Write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one.	ⓈMATH.3.13B Interpret information from pictographs and bar graphs.		ⓈMATH.5.13C Graph a given set of data using an appropriate graphical representation such as a picture or line graph.			
						ⓂMATH.5.13B Describe characteristics of data presented in tables and graphs including median, mode, and range.				



**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix (2013 – 2014)**

K-2 Revised 2012	Prekindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	3-5 Revised 2008
	Probability							
					ⓈMATH.3.13C Use data to describe events as more likely than, less likely than, or equally likely as.	ⓈMATH.4.13A Use concrete objects or pictures to make generalizations about determining all possible combinations of a given set of data or of objects in a problem situation.	ⓈMATH.5.12C List all possible outcomes of a probability experiment such as tossing a coin <i>using a variety of representations such as tables, charts, and tree diagrams.</i>	Reporting Category 5 – Probability and Statistics The student will demonstrate an understanding of probability and statistics.
						ⓈMATH.5.12A Use fractions to describe the results of an experiment.		
						ⓂMATH.5.12B Use experimental results to make predictions.		
	Financial Literacy							
Personal Financial Literacy The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security.		MATH.K.9A Identify ways to earn income.	MATH.1.9A Define money earned as income.	MATH.2.11A Calculate how money saved can accumulate into a larger amount over time.	MATH.3.9A Explain the connection between human capital/labor and income.	MATH.4.10A Distinguish between fixed and variable expenses.	MATH.5.10A Define income tax, payroll tax, sales tax, and property tax.	Personal Financial Literacy The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security.
		MATH.K.9B Differentiate between money received as income and money received as gifts.	MATH.1.9B Identify income as a means of obtaining goods and services, oftentimes making choices between wants and needs.	MATH.2.11B Explain that saving is an alternative to spending.	MATH.3.9B Describe the relationship between the availability or scarcity of resources and how that impacts cost.	MATH.4.10B Calculate profit in a given situation.	MATH.5.10B Explain the difference between gross income and net income.	
		MATH.K.9C List simple skills required for jobs.	MATH.1.9C Distinguish between spending and saving.	MATH.2.11C Distinguish between a deposit and a withdrawal.	MATH.3.9C Identify the costs and benefits of planned and unplanned spending decisions.	MATH.4.10C Compare the advantages and disadvantages of various savings options.	MATH.5.10C Identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments.	
		MATH.K.9D Distinguish between wants and needs and identify income as a source to meet one's wants and needs.	MATH.1.9D Consider charitable giving.	MATH.2.11D Identify examples of borrowing and distinguish between responsible and irresponsible borrowing.	MATH.3.9D Explain that credit is used when wants or needs exceed the ability to pay and that it is the borrower's responsibility to pay it back to the lender, usually with interest.	MATH.4.10D Describe how to allocate a weekly allowance among spending, saving, including for college, and sharing.	MATH.5.10D Develop a system for keeping and using financial records.	
				MATH.2.11E Identify examples of lending and use concepts of benefits and costs to evaluate lending decisions.	MATH.3.9E List reasons to save and explain the benefit of a savings plan, including for college.	MATH.4.10E Describe the basic purpose of financial institutions including keeping money safe, borrowing money, and lending money	MATH.5.10E Describe actions that might be taken to balance a budget when expenses exceed income.	
				MATH.2.11F Differentiate between producers and consumers and calculate the cost to produce a simple item.	MATH.3.9F Identify decisions involving income, spending, saving, credit, and charitable giving.		MATH.5.10F Balance a simple budget.	

