

**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix**

| Strand | Prekindergarten | Kindergarten | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---|---|---|---|--|---|--|---|
| Strand 1 – Number, Operation, and Quantitative Reasoning | Numbers | | Numbers and Place Value | | | | |
| | <p>P MATH.PK.1A Arrange sets of concrete objects in one-to-one correspondence (by placing objects next to each other).</p> <p>MATH.PK.1D Begin to compare the numbers of concrete objects using language (e.g., “same” or “equal”, “one more”, “more than”, or “less than”).</p> | <p>P MATH.K.1A Use one-to-one correspondence and language such as more than, same number as, or 2 less than to describe relative sizes of sets of concrete objects.</p> | <p>MATH.1.1A Compare and order whole numbers to 99 (less than, greater than, or equal to) using sets of concrete objects and pictorial models.</p> | <p>P MATH.2.1C Use place value to compare and order whole numbers to 999 and record the comparisons using numbers and symbols (<, =, >), moving from concrete and pictorial representations to the symbolic level.</p> | <p>MATH.3.1B Use place value to compare and order whole numbers through 9,999 moving from concrete models and pictorial representations to the symbolic level.</p> | | |
| | <p>P MATH.PK.1C Knows objects can be counted and demonstrates that the counting sequence remains the same.</p> | <p>P MATH.K.1B Use sets of concrete objects to represent quantities given in verbal or written form (through 20).</p> | <p>P MATH.1.1B Create sets of tens and ones using concrete objects to describe, compare, and order whole numbers to 99.</p> | <p>MATH.2.1A Use concrete models of hundreds, tens, and ones to represent a given whole number (up to 999) in various ways.</p> | | | |
| | <p>MATH.PK.1E Begin to name “how many” in a group up to three (or more) objects without counting (e.g., recognizing two or three crayons in a box).</p> | <p>P MATH.K.1C Use numbers to describe how many objects are in a set (through 20), using verbal and symbolic descriptions.</p> | <p>MATH.1.1D Read and write numbers to 99 to describe sets of concrete objects in standard, expanded, and written forms.</p> | <p>MATH.2.1B Use place value to read, write, and describe the value of whole numbers, to 999, in standard, expanded, and written forms.</p> | <p>P MATH.3.1A Use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999 in standard, expanded, and written forms.</p> | <p>MATH.4.1A Use place value to read (in symbols and words), write, compare, and order whole numbers through 999,999,999 in standard, expanded, and written forms.</p> | <p>MATH.5.1A Use place value to read, write, compare and order whole numbers through the 999,999,999,999 in standard, expanded, and written forms.</p> |
| | <p>MATH.PK.1K Recognize one digit numerals 0-9.</p> | | | | | <p>P MATH.4.1B Use place value to read (in symbols and words), write, compare, and order decimals involving tenths and hundredths, including money, using concrete objects and pictorial models.</p> | <p>P MATH.5.1B Use place value to read, write, compare, and order decimals through the thousandths place moving from concrete models and pictorial representations to the symbolic level.</p> |
| | <p>MATH.PK.1F Demonstrate understanding that when counting, the items can be chosen in any order.</p> | | | | | | |
| | <p>P MATH.PK.1I* Count concrete objects to 10 and demonstrate that the last number counted indicates how many items were counted.</p> | | | <p>MATH.2.8A Use whole numbers to locate and name points on a number line, moving from concrete and pictorial representations to the symbolic level.</p> | <p>MATH.3.10A Locate and name points on a number line using whole numbers and fractions, including halves and fourths</p> | <p>MATH.4.10A Locate and name points on a number line using whole numbers, fractions including halves and fourths, and decimals such as tenths.</p> | |



What is it we want all students to learn?



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| Strand 1 – Number, Operation, and Quantitative Reasoning | Numbers (continued) | | Numbers and Place Value (continued) | | | | |
| | | | MATH.1.1C Identify individual coins by name and value and describe relationships among them (penny, nickel, dime, quarter). | P MATH.2.3D Determine the value of a collection of coins up to one dollar. MATH.2.3E Describe how the cent symbol, dollar symbol, and the decimal point are used to name the value of a collection of coins. | MATH.3.1C Determine the value of a collection of coins and bills. | (See MATH.4.1B) | |
| | Ordering of Events | | | | | | |
| | | MATH.K.2A Use language such as before or after to describe relative position in a sequence of events or objects. | | | | | |
| | MATH.PK.1G Use ordinal terms verbally (first through fifth) including “first”, “last”, and “next” in classroom activities or routines. | MATH.K.2B Name the ordinal positions in a sequence such as first, second, third, etc. for objects through the tenth position. | | | | | |
| | Fractions | | | | | | |
| | MATH.PK.1J Demonstrate informal strategies to share up to 10 concrete items equally. | P MATH.K.3A Share a whole by separating it into two equal parts. | P MATH.1.2A Separate a whole into two, three, or four equal parts and use appropriate language to describe the parts such as three out of four equal parts. | MATH.2.2A Use concrete models to represent and name fractional parts of a whole object (with denominators of 12 or less), using a variety of manipulatives. | 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. | | |
| | | MATH.K.3B Explain why a given part is half of the whole. | MATH.1.2B Use appropriate language to describe part of a set such as three out of the eight crayons are red. | P MATH.2.2B Use concrete models to represent and name fractional parts of a set of objects (with denominators of 12 or less), using a variety of manipulatives. | MATH.3.2C Use fraction names and symbols to describe fractional parts of whole objects or sets of objects. | | |



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| Strand 1 – Number, Operation, and Quantitative Reasoning | Fractions (continued) | | | | | Fractions and Decimals | |
| | | | | | 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. | P 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. |
| | | | | MATH.2.2C Use concrete models to determine if a fractional part of a whole is closer to 0, $1/2$, or 1. | P MATH.3.2B Compare fractional parts of whole objects or sets of objects in a problem situation using concrete models. | P MATH.4.2C Compare and order fractions using concrete objects and pictorial models for whole objects and sets of objects. | MATH.5.2C Compare two fractional quantities in problem-solving situations using a variety of methods, including common denominators, concrete or pictorial models, and benchmark fractions. |
| | | | | | | MATH.4.2B Model fraction quantities greater than one using concrete objects and pictorial models, and record the value. | P MATH.5.2B Generate a mixed number equivalent to a given improper fraction or generate an improper fraction equivalent to a given mixed number using various strategies including concrete objects, pictorial models, and patterns to generalize a rule for the process. |
| | | | | (See MATH.2.3D) | (See MATH.3.1C) | P MATH.4.2D Relate decimals to fractions that name tenths and hundredths using concrete objects and pictorial models. | P MATH.5.2D Use models to relate decimals to fractions that name tenths, hundredths, and thousandths with models such as base-ten blocks, fraction bars, and paper grids. |



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| Strand 1 – Number, Operation, and Quantitative Reasoning | Modeling Operations | | | | | | |
| | MATH.PK.1H Use concrete objects to make a verbal word problem by adding or subtracting up to five objects. | P MATH.K.4A Model, create, and describe addition (joining) and subtraction (separating) problems in real situations with concrete objects. | P MATH.1.3A Model and create addition and subtraction problem situations with concrete objects and write corresponding number sentences. | P MATH.2.3B Model addition and subtraction of two-digit numbers with objects, pictures, words, and numbers. | 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. |
| | | | P MATH.1.3B Use concrete and pictorial models to apply basic addition and subtraction facts (up to $9 + 9 = 18$ and $18 - 9 = 9$). | P MATH.2.3A Recall and apply basic addition and subtraction facts (to 18), using them to work flexibly, efficiently, and accurately when solving problems. | | | |
| | | | | MATH.2.4A Model, create, and describe multiplication situations in which equivalent sets of concrete objects are joined. | P MATH.3.4A Learn and apply multiplication facts through 12 by 12 using concrete models and objects (array/area and grouping models). | MATH.4.4C Recall and apply multiplication facts through 12×12 . | |
| | | | | | | MATH.4.4A Model factors and products using arrays and area models. | P MATH.5.3D Identify common factors of a set of whole numbers using a variety of strategies and manipulatives. |
| | | | | MATH.2.4B Model, create, and describe division situations in which a set of concrete objects is separated into equivalent sets. | P MATH.3.4C Use models to solve division problems and use number sentences to record the solutions for contexts involving sharing equally and measuring out. | MATH.4.4B Represent multiplication and division situations in picture, word, and number form. | MATH.5.5B Identify prime and composite numbers using concrete objects, pictorial models, and patterns in factor pairs. |



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| Strand 1 – Number, Operation, and Quantitative Reasoning | | | | Solving Problems with Addition, Subtraction, Multiplication, Division | | | | |
| | | | | P MATH.2.3C Select addition or subtraction to solve problems using two-digit numbers, whether or not regrouping is necessary, using a variety of strategies. | P MATH.3.3B Select addition or subtraction and use the operation to solve problems involving whole numbers through 999 using a variety of strategies. | MATH.4.3A Use addition and subtraction to solve problems involving whole numbers using a variety of strategies. | MATH.5.3A Use addition and subtraction to solve problems involving whole numbers and decimals using a variety of strategies. | |
| | | | | | P MATH.3.4B Solve and record multiplication problems (up to two digits times one digit). | P MATH.4.4D Use multiplication to solve problems (no more than two digits times two digits without technology) applying array/area models to multiplication algorithms. | MATH.5.3B Use multiplication to solve problems involving whole numbers (no more than three-digits times two-digits without technology) applying array/area models to multiplication algorithms. | |
| | | | | | (See MATH.3.4C) | P MATH.4.4E Use division to solve problems (no more than one-digit divisors and three-digit dividends without technology) for sharing equally and measuring out contexts applying models to division algorithms. | 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 within a given context for sharing equally and measuring out contexts applying models to division algorithms. | |
| | | | | | | 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. | | |
| | | | | | P MATH.3.5B Use strategies including rounding and compatible numbers to estimate solutions to addition and subtraction problems. | P MATH.4.5B Use strategies including rounding and compatible numbers to estimate solutions to multiplication and division problems. | MATH.5.4A Use strategies, including rounding and compatible numbers to estimate solutions to addition, subtraction, multiplication, and division problems. | |



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| Strand 2 – Patterns, Relationships, and Algebraic Thinking | Patterns and Generalizations | | | | | | | |
| | MATH.PK.2A Imitate pattern sounds and physical movements (e.g., clap, stomp, clap, stomp...). | MATH.K.5A Identify, extend, create, and describe patterns of sounds, physical movement, and concrete objects. | P MATH.1.4A Identify, describe, and extend concrete and pictorial repeating and additive (growing) patterns in order to make predictions and solve problems. | P MATH.2.6C Identify, describe, and extend repeating and additive (growing) patterns to make predictions and solve problems. | P MATH.3.6A Identify and extend whole-number and geometric patterns to make predictions and solve problems including determining the missing number/term. | | | |
| | | | MATH.1.5A Use patterns to skip count by twos, fives, and tens. | MATH.2.5A Find patterns in numbers such as in a 100s chart. | | | | |
| | | | MATH.1.5B Find patterns in numbers, including odd and even. | | | | | |
| | | | MATH.1.5C Compare and order whole numbers using place value (up to 99) and identify patterns that assist in comparing two-digit numbers. | MATH.2.5B Use patterns in place value to compare and order whole numbers through 999. | | | | |
| | | P MATH.1.5D Use patterns to develop strategies to solve basic addition and basic subtraction problems, including counting up, counting back, doubles, doubles plus/minus one, and making ten. | P 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.3.6B Identify patterns in multiplication facts using concrete objects, pictorial models, or technology. | P MATH.4.6B Use patterns to multiply by 10 and 100. | | | |
| | | MATH.1.5E Identify patterns in related addition and subtraction sentences (fact families for sums to 18) such as $2 + 3 = 5$, $3 + 2 = 5$, $5 - 2 = 3$, and $5 - 3 = 2$. | | 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 $81 \div 9 = 9$). | | |



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| Strand 2 – Patterns, Relationships, and Algebraic Thinking | Expressing Relationships and Making Predictions | | | | | | |
| | P MATH.PK.2B* Recognize, reproduce, predict, and create simple patterns of concrete objects (string beads: red, blue, red, blue, red...). | P MATH.K.6A Use patterns to predict what comes next, including cause-and-effect relationships. | (See MATH.1.4A) | (See MATH.2.6C) | (See MATH.3.6A) | | |
| | MATH.PK.1B Count by ones to 30 or higher using correct verbal counting sequence. | MATH.K.6B Count by ones to 100 using correct verbal counting sequence. | | | | | |
| | | | | MATH.2.6A Generate a list of paired numbers based on a real-life situation such as number of tricycles related to number of wheels. | MATH.3.7A Generate a table of paired numbers based on a real-life situation such as insects and legs. | P MATH.4.7A Describe the relationship between two sets of related data such as ordered pairs in a table, extend the pattern, and state the rule for non-consecutive related number pairs. | P MATH.5.5A Describe the relationship between sets of data in graphic organizers such as lists, tables, charts, and diagrams, extend the pattern, and state the rule for non-consecutive related number pairs. |
| | | | MATH.2.6B Identify patterns in a list of related number pairs based on a real-life situation and extend the list. | P MATH.3.7B Identify and describe patterns in a table of related number pairs based on a meaningful problem and extend the table. | | P MATH.5.6A Select from and use diagrams and equations such as $y = 5 + 3$ to represent meaningful problem situations involving addition, subtraction, multiplication, or division. | |
| Strand 3 - Geometry and Spatial Reasoning | Geometric Language | | | | | | |
| | MATH.PK.3B* Use words that indicate where things are in space (e.g., beside, inside, behind, above, below). | MATH.K.7A Describe one object in relation to another using informal language such as over, under, above, and below. | | | | | |
| | | MATH.K.7B Place an object in a specified position. | | | | | |
| | P MATH.PK.5A Match objects that are alike by picture, size, number, shape, or texture. (Classification & Data Collection Strand) | P MATH.K.8A Describe and identify an object by its attributes using informal language (including shape, size, type, color, texture, or use). | | | | | |



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| Strand 3 - Geometry and Spatial Reasoning | Geometric Language (continued) | | | | | | |
| | MATH.PK.5B Sort and describe similarities and differences between objects. (Classification & Data Collection Strand) | MATH.K.8B Compare two objects based on their attributes. | | | | | |
| | P MATH.PK.5C Sort objects into groups by an attribute and begin to explain how the grouping was done. (Classification & Data Collection Strand) | MATH.K.8C Sort a variety of objects, including two- and three-dimensional geometric figures, according to their attributes and describe how the objects are sorted. | P MATH.1.6C Describe and identify two- and three-dimensional geometric figures in order to sort them according to a given attribute using informal and formal language. | | | | |
| | | P MATH.K.9A Describe and compare the attributes of real-life objects such as balls, boxes, cans, and cones or models of three-dimensional geometric figures. | MATH.1.6B Describe and identify three-dimensional geometric figures, including spheres, rectangular prisms (including cubes), cylinders, and cones. | P MATH.2.7A Describe attributes (the number of vertices, faces edges, sides) of two- and three-dimensional geometric figures such as circles, polygons, spheres, cones, cylinders, prisms and pyramids, etc. | P MATH.3.8A 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. | P MATH.4.8C Use essential attributes to define two- and three-dimensional geometric figures such as number of edges, number of faces, number of vertices, types of angles, and shapes of faces and base | P MATH.5.7A Identify essential attributes including parallel, perpendicular, and congruent parts of two- and three-dimensional geometric figures and use formal geometric vocabulary to describe and compare given figures. |
| | | MATH.K.9B Recognize shapes in real-life three-dimensional geometric figures or models of three-dimensional geometric figures. | | MATH.2.7B Use attributes to describe how 2 two-dimensional figures or 2 three-dimensional geometric figures are alike or different. | | | |
| | P MATH.PK.3A Recognize, describe, and name four common shapes (circles, triangles, rectangles, squares). | MATH.K.9C Describe, identify, and compare circles, triangles, rectangles, and squares (a special type of rectangle). | MATH.1.6A Describe and identify two-dimensional geometric figures, including circles, triangles, rectangles, and squares (a special type of rectangle). | | | 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. | |



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| Strand 3 - Geometry and Spatial Reasoning | Geometric Language (continued) | | | | Transformations | | |
| | MATH.PK.3C Slide, flip, and turn shapes to demonstrate that shapes remain the same. | MATH.K(PK.3D) Investigate and predict the results of putting two or more shapes together. | MATH.1.6D Use concrete models to combine two- dimensional geometric figures to make new geometric figures. | MATH.2.7C Cut two-dimensional geometric figures apart and identify the new geometric figures formed. | | | |
| | MATH.PK.3D Begin to investigate and to predict the results of putting two or more shapes together. | | | | 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.PK.3E Put together puzzles of increasing complexity. | | | | 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. P MATH.5.8A Sketch the results of translations, rotations, and reflections on a Quadrant I coordinate grid and name points using ordered pairs. | |
| | | | | | 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. |
| Strand 4 - Measurement | Measuring | | | | | | |
| | MATH.PK.4C Begin to make size comparisons between two objects (e.g., taller than, smaller than). | P MATH.K.10A Compare and order two or three concrete objects according to length (longer/shorter than, or the same). | MATH.1.7A Estimate and measure length using nonstandard units such as paper clips or sides of color tiles. | P MATH.2.9A Identify concrete models that approximate standard units of length and use them to measure length in the customary system and SI (metric) system. | P MATH.3.11A Use linear measurement tools to estimate and measure lengths using standard units in customary system and SI (metric) system. | P 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 concrete models and pictorial representations for perimeter, area, and volume with their respective formulas. |
| P MATH.PK.4D Begin to order two or three objects or people by size. | P MATH.1.7C Describe the relationship between the size of the unit and the number of units needed to measure the length of an object. | | MATH.3.11B Use standard units to find the perimeter of a shape. | | P MATH.5.10C Select and use appropriate units and formulas to measure length, perimeter, area, and volume in customary system and SI (metric) system. | | |



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| Strand 4 - Measurement | Measuring (continued) | | | | | | |
| | | (See MATH.K.10A) | MATH.1.7B Compare and order two or more concrete objects according to length (from longest to shortest). | | | | |
| | MATH.PK.4A Cover an area with shapes (e.g., tiles). | MATH.K.10B Compare the areas of two flat surfaces of two-dimensional figures (covers more, covers less, or covers the same). | MATH.1.7D Compare and order the area of two or more two-dimensional surfaces (from covers the most to covers the least). | MATH.2.9B Select a nonstandard unit of measure such as square tiles to determine the area of a two-dimensional surface. | MATH.3.11C Use concrete and pictorial models of square units to determine the area of two-dimensional surfaces. | (See MATH.4.11A) | (See MATH.5.10B and MATH.5.10C) |
| | MATH.PK.4B Recognize how much can be placed within an object. | MATH.K.10C Compare two containers according to capacity (holds more, holds less, or holds the same). | MATH.1.7E Compare and order two or more containers according to capacity (from holds the most to holds the least). | P MATH.2.9C Select a nonstandard unit of measure such as a bathroom cup or a jar to determine the capacity of a given container. | MATH.3.11E Identify concrete models that approximate standard units for capacity and use them to measure capacity in the customary system and SI (metric) system. | MATH.4.11E Explain the difference between weight and mass. | |
| | | P MATH.K.10D Compare two objects according to weight/mass (heavier than, lighter than, or equal to). | MATH.1.7F Compare and order two or more objects according to weight/mass (from heaviest to lightest). | MATH.2.9D Select a nonstandard unit of measure such as beans or marbles to determine the weight/mass of a given object. | P MATH.3.11D Identify concrete models that approximate standard units of weight/mass and use them to measure weight/mass in the customary system and SI (metric) system. | | |
| | | | | | | MATH.3.11F Use concrete models that approximate cubic units to determine the volume of a given container or other three-dimensional geometric figure in the customary system and SI (metric) system. | MATH.4.11C Use concrete models of standard cubic units to measure volume in customary system and SI (metric) system. MATH.4.11D Estimate volume in cubic units. |
| | | | | | | | P 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 |



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| Strand 4 - Measurement | Time and Temperature | | | | | | |
| | | MATH.K.10E Compare situations or objects according to relative temperature (hotter/colder than, or the same as). | MATH.1.7G Compare and order two or more objects according to relative temperature (from hottest to coldest). | MATH.2.10A Read a thermometer to gather data (in degrees Fahrenheit). | MATH.3.12A Use a thermometer to measure temperature (in degrees Fahrenheit). | MATH.4.12A Use a thermometer to measure temperature and changes in temperature (in degrees Fahrenheit and Celsius). | MATH.5.11A Solve problems involving changes in temperature. (in degrees Fahrenheit and Celsius). |
| | | MATH.K.11A Compare events according to duration such as more time than or less time than. | MATH.1.8A Order three or more events according to duration. | MATH.2.10C Describe activities that take approximately one second, one minute, and one hour. | | | |
| | | MATH.K.11B Sequence events (up to three). | | | | | |
| | MATH.PK.4E Begin to categorize time intervals and use language associated with time in everyday situations (“in the morning”, “after snack”). | MATH.K.11C Read a calendar using days, weeks, and months. | P MATH.1.8B Read time to the hour and half-hour using analog and digital clocks. | P MATH.2.10B Read and write times shown on analog and digital clocks using five-minute increments. | MATH.3.12B Tell and write time shown on analog and digital clocks. | P MATH.4.12B Use tools such as a clock with gears or a stopwatch to solve problems involving elapsed time. | MATH.5.11B Solve problems involving elapsed time. |
| Strand 5 – Probability and Statistics | Displaying and Interpreting Data | | | | | | |
| | MATH.PK.5D Participate in creating and using real and pictorial graphs. | MATH.K.12A Construct graphs using real objects or pictures in order to answer questions. | MATH.1.9A Collect and sort data. | MATH.2.11A Construct picture graphs and bar-type graphs. | P 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. | (See MATH.4.13B) | (See MATH.5.9A) |
| | | | MATH.1.9B Use organized data to construct real object graphs, picture graphs, and bar-type graphs. | | | | MATH.5.13A Use tables of related number pairs to make line graphs. |
| | P MATH.K.12B Use information from a graph of real objects or pictures in order to answer questions. | P MATH.1.10A Draw conclusions and answer questions using information organized in real-object graphs, picture graphs, and bar-type graphs. | P MATH.2.11B Draw conclusions and answer questions based on picture graphs and bar-type graphs. | MATH.3.13B Interpret information from pictographs and bar graphs. | MATH.4.13B Interpret bar graphs using verbal and numerical data to summarize and answer questions. | P MATH.5.13B Describe characteristics of data presented in tables and graphs including median, mode, and range. | |



What is it we want all students to learn?



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**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix**

| Strand | Prekindergarten | Kindergarten | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|--|------------------------|--|--|--|--|--|---|
| Strand 5 – Probability and Statistics | Probability | | | | | | |
| | | | MATH.1.10B Identify events as certain or impossible such as drawing a red crayon from a bag of green crayons. | MATH.2.11C Use data to describe events as more likely or less likely such as drawing a certain color crayon from a bag of seven red crayons and three green crayons. | MATH.3.13C Use data to describe events as more likely than, less likely than, or equally likely as. | P 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 using a variety of representations such as tables, charts, and tree diagrams. |
| | | | | | | | MATH.5.12A Use fractions to describe the results of an experiment. |
| | | | | | | | MATH.5.12B Use experimental results to make predictions. |
| Strand 6 – Underlying Processes and Mathematical Tools | Problem Solving | | | | | | |
| | | MATH.K.13A Identify the mathematics in everyday situations. | MATH.1.11A Identify the mathematics in everyday situations. | MATH.2.12A Identify the mathematics in everyday situations. | MATH.3.14A Identify the mathematics in everyday situations. | MATH.4.14A Identify the mathematics in everyday situations. | MATH.5.14A Identify the mathematics in everyday situations. |
| | | MATH.K.13B Solve problems with guidance that incorporates the processes of understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | MATH.1.11B Solve problems with guidance that incorporates the processes of understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | MATH.2.12B Solve problems with guidance that incorporates the processes of understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | MATH.3.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | MATH.4.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. | MATH.5.14B Solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness. |
| | | P MATH.K.13C Select or develop an appropriate problem-solving strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out in order to solve a problem. | P MATH.1.11C 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 in order to solve a problem. | P MATH.2.12C 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 in order to solve a problem. | P 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 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 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 MATH.K.13D Use tools such as real objects, manipulatives, and technology to solve problems. | MATH.1.11D Use tools such as real objects, manipulatives, and technology to solve problems. | MATH.2.12D Use tools such as real objects, manipulatives, and technology to solve problems. | MATH.3.14D Use tools such as real objects, manipulatives, and technology to solve problems. | MATH.4.14D Use tools such as real objects, manipulatives, and technology to solve problems. | MATH.5.14D Use tools such as real objects, manipulatives, and technology to solve problems. |



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**Mathematics – Prekindergarten – Grade 5
Vertical Alignment Matrix**

| Strand | Prekindergarten | Kindergarten | Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 |
|---|------------------------------------|--|---|---|---|---|---|
| Strand 6 – Underlying Processes and Mathematical Tools | Problem Solving (continued) | | | | | | |
| | | MATH.K.14A Communicate mathematical ideas using objects, words, pictures, numbers, and technology. | MATH.1.12A Explain and record observations using objects, words, pictures, numbers, and technology. | MATH.2.13A Explain and record observations using objects, words, pictures, numbers, and technology. | MATH.3.15A Explain and record observations using objects, words, pictures, numbers, and technology. | MATH.4.15A Explain and record observations using objects, words, pictures, numbers, and technology. | MATH.5.15A Explain and record observations using objects, words, pictures, numbers, and technology. |
| | | MATH.K.14B Relate everyday language to mathematical language and symbols. | MATH.1.12B Relate informal language to mathematical language and symbols. | MATH.2.13B Relate informal language to mathematical language and symbols. | MATH.3.15B Relate informal language to mathematical language and symbols. | MATH.4.15B Relate informal language to mathematical language and symbols. | MATH.5.15B Relate informal language to mathematical language and symbols. |
| | | | | | MATH.3.16A Make generalizations from patterns or sets of examples and non-examples. | MATH.4.16A Make generalizations from patterns or sets of examples and non-examples. | MATH.5.16A Make generalizations from patterns or sets of examples and non-examples. |
| | | P MATH.K.15A Justify his or her thinking using objects, words, pictures, numbers, and technology. | P MATH.1.13A Justify his or her thinking using objects, words, pictures, numbers, and technology. | P MATH.2.14A Justify his or her thinking using objects, words, pictures, numbers, and technology. | P MATH.3.16B Justify why an answer is reasonable and explain the solution process. | P MATH.4.16B Justify why an answer is reasonable and explain the solution process. | P MATH.5.16B Justify why an answer is reasonable and explain the solution process. |



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