



Alignment Document
State of Hawaii and Aventa Learning Integrated Math

Integrated Math
2005-2007 Benchmark Blueprint

| Strand | Standard | Topic | Benchmark | Unit Name | Course Topic Description |
|------------------------|---|----------------------------|---|--|---|
| Numbers and Operations | AI.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems | Numbers and Number Systems | MA.AI.1.1 Recognize situations that can be represented by matrices | | |
| Numbers and Operations | AI.2 Understand the meaning of operations and how they relate to each other | | There are no benchmarks for this standard for this Grade/Course | | |
| Numbers and Operations | AI.3 Use computational tools and strategies fluently and, when appropriate, use estimation | Computational Fluency | <p>MA.AI.3.1 Apply arithmetic properties to operate on and simplify expressions that include radicals and other real numbers</p> <p>MA.AI.3.2 Apply the laws of exponents to perform operations on expressions with integral exponents</p> <p>MA.AI.3.3 Use addition, subtraction, and scalar multiplication of matrices to solve problems</p> | <p>Number Sense</p> <p>Operations</p> <p>Number Sense</p> <p>Algebraic Sense</p> | <p>Covered throughout the unit</p> <p>Order of Operations</p> <p>Exponents</p> <p>Expressions with Powers</p> |

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| Measurement | AI.4 Understand attributes, units, and systems of units in measurement; and develop and use techniques, tools, and formulas for measuring | Measurement Formulas | MA.AI.4.1 Use formulas, functions, or conversion equations to solve problems dealing with determining a measurement based on another derived or given measurement | Measurement Measurement | Metric Measurement – Conversions Customary Measurements |
| Geometry and Spatial Sense | AI.5 Analyze properties of objects and relationships among the properties | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AI.6 Use transformations and symmetry to analyze mathematical situations | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AI.7 Use visualization and spatial reasoning to solve problems both within and outside of mathematics | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AI.8 Select and use different representational systems, including coordinate geometry | Coordinate Geometry | MA.AI.8.1 Graph linear equations using slope-intercept, point-slope, and x- and y-intercept techniques MA.AI.8.2 Determine the slope of a line when given the graph of a line, two points on the line, or the equation of the line | Algebraic Sense Algebraic Sense Geometric Movement | Graphing Equations & Inequalities Graphing Equations & Inequalities The Coordinate Plane |
| Patterns, Functions, and Algebra | AI.9 Understand various types of patterns and functional relationships | Patterns Functions | MA.AI.9.1 Determine if a linear pattern exists in a set of data and represent the data algebraically and graphically MA.AI.9.2 Compare and contrast the concepts of direct and inverse variation of a relation MA.AI.9.3 Determine the zeros of a linear or quadratic function algebraically and graphically MA.AI.9.4 Compare and contrast the properties of linear functions and exponential functions | Algebraic Sense Algebraic Sense | Overview Number Patterns |



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| Patterns, Functions, and Algebra | AI.10 Use symbolic forms to represent, model, and analyze mathematical situations | Numeric and Algebraic Representations | MA.AI.10.1 Solve linear equations and inequalities in one variable using a variety of strategies (e.g., algebraically, by graphing, by using a graphing calculator) | Algebraic Sense | Graphing Equations & Inequalities |
| | | | | Algebraic Sense | Graphing and Writing Inequalities |
| | | | | Algebraic Sense | Inequalities |
| | | | | Algebraic Sense | Solving Two-Step Equations |
| | | | MA.AI.10.2 Translate between verbal mathematical situations and algebraic expressions and equations | Algebraic Sense | Intro to Algebraic Expressions |
| | | | | Algebraic Sense | Solving Single-Step Equations |
| | | | | Geometric Movement | Geometric Problem Solving |
| | | | MA.AI.10.3 Justify the steps used in simplifying expressions and solving equations and inequalities | Algebraic Sense | The Commutative Property |
| | | | | Algebraic Sense | The Associative Property |
| | | | | Algebraic Sense | The Distributive Property |
| | Algebraic Sense | Solving Two-Step Equations | | | |
| | Geometric Movement | Geometric Problem Solving | | | |
| MA.AI.10.4 Determine the equation of a line when given the graph of the line, the slope and a point on the line, or two points on the line | Algebraic Sense | Graphing Equations & Inequalities | | | |
| | Geometric Movement | The Coordinate Plane | | | |
| MA.AI.10.5 Solve systems of two linear equations in two variables algebraically and graphically | Algebraic Sense | Systems of two linear equations with two variables | | | |

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| | | | <p>MA.AI.10.6 Factor first- and second-degree binomials and trinomials in one or two variables</p> <p>MA.AI.10.7 Solve quadratic equations in one variable algebraically, graphically, or by using graphing technology</p> <p>MA.AI.10.8 Select and use a variety of strategies (e.g., concrete objects, pictorial representations, algebraic manipulation) to perform operations on polynomials</p> <p>MA.AI.10.9 Analyze transformations of lines and understand how the transformation are represented in equations</p> | | |
| Data Analysis, Statistics, and Probability | AI.11 Pose questions and collect, organize, and represent data to answer those questions | | There are no benchmarks for this standard for this Grade/Course. | | |
| Data Analysis, Statistics, and Probability | AI.12 Interpret data using methods of exploratory data analysis | Data Interpretation | <p>MA.AI.12.1 Compare data sets using statistical techniques (e.g., measures of central tendency, standard deviation, range, stem-and-leaf plots, and box-and-whisker graphs)</p> <p>MA.AI.12.2 Display bivariate data in a scatter plot, describe its shape, and determine the line of best fit that models a trend (if a trend exists)</p> | <p>Introduction to Probability</p> <p>Introduction to Probability</p> <p>Introduction to Probability</p> <p>Probability 2</p> | <p>Mean, Median, and Mode</p> <p>Data Concerns</p> <p>Theoretical Probability</p> <p>Scatter Plots</p> |
| Data Analysis, Statistics, and Probability | AI.13 Develop and evaluate inferences, predictions, and arguments that are based on data | | There are no benchmarks for this standard for this Grade/Course. | | |

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| Data Analysis, Statistics, and Probability | AI.14 Understand and apply basic notions of chance and probability | | There are no benchmarks for this standard for this Grade/Course. | | |
| Numbers and Operations | G.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems | Vectors | MA.G.1.1 Recognize situations that can be represented by vectors | | |
| Numbers and Operations | G.2 Understand the meaning of operations and how they relate to each other | | There are no benchmarks for this standard for this Grade/Course. | | |
| Numbers and Operations | G.3 Use computational tools and strategies fluently and, when appropriate, use estimation | Vectors | MA.G.3.1 Use vector addition, subtraction, and scalar multiplication to solve problems | | |
| Measurement | G.4 Understand attributes, units, and systems of units in measurement; and develop and use techniques, tools, and formulas for measuring | Measurement Formulas | <p>MA.G.4.1 Use right triangle trigonometric ratios to solve for an unknown length of a side or the measure of an angle</p> <p>MA.G.4.2 Solve problems using the formulas for perimeter, circumference, area, and volume of two- and three- dimensional figures and solids</p> <p>MA.G.4.3 Determine the effect of dimension changes to perimeter, area, and volume for common geometric figures and solids</p> | <p>Measurement</p> <p>Measurement</p> <p>Measurement</p> <p>Geometric Figures</p> <p>Geometric Movement</p> <p>Measurement</p> <p>Measurement</p> <p>Measurement</p> | <p>Volume</p> <p>Area</p> <p>Perimeter</p> <p>Prisms, Cones & Pyramids</p> <p>Geometric Problem Solving</p> <p>Volume</p> <p>Area</p> <p>Perimeter</p> |
| Geometry and Spatial Sense | G.5 Analyze properties of objects and relationships among the properties | Geometric Shapes and Their Properties and Relationships | MA.G.5.1 Use inductive and deductive reasoning to create and defend geometric conjectures | <p>Geometric Figures</p> <p>Geometric Figures</p> | <p>Perpendicular and Parallel Lines</p> <p>Prisms, Cones & Pyramids</p> |

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| | | | <p>MA.G.5.2 Use the concept of corresponding parts to prove that triangles, and other polygons, are congruent or similar</p> <p>MA.G.5.3 Explain properties and characteristics of angle bisectors, perpendicular bisectors, and parallel lines</p> <p>MA.G.5.4 Use the relationship between pairs of angles (e.g., complementary, supplementary, vertical, exterior, interior) to determine unknown angle measures or definitions of properties</p> <p>MA.G.5.5 Apply the concepts of special right triangles to real-world situations</p> <p>MA.G.5.6 Use the relationships among properties of circles (e.g., chords, secants, tangents, arcs, circumference, radius, diameter, inscribed polygons) to solve problems</p> | <p>Geometric Figures</p> <p>Geometric Figures</p> <p>Geometric Figures</p> <p>Geometric Figures</p> <p>Geometric Figures</p> <p>Geometric Figures</p> | <p>Angles</p> <p>Points, Lines, & the Plane</p> <p>Perpendicular and Parallel Lines</p> <p>Angles</p> <p>Pairs of Angles</p> <p>Polygons</p> <p>Perpendicular and Parallel Lines</p> |
| Geometry and Spatial Sense | G.6 Use transformations and symmetry to analyze mathematical situations | Transformation | MA.G.6.1 Describe three-dimensional figures that are formed by translating two-dimensional figures | Geometric Figures | Prisms, Cones & Pyramids |
| Geometry and Spatial Sense | G.7 Use visualization and spatial reasoning to solve problems both within and outside of mathematics | <p>Visualization and Spatial Reasoning</p> <p>Geometric Modeling</p> | <p>MA.G.7.1 Draw cross-sections, truncations, and compositions/decompositions of three-dimensional objects</p> <p>MA.G.7.2 Use concrete objects, pictorial representations, computer software, or graphing calculators to solve geometric</p> | <p>Geometric Figures</p> <p>Geometric Movement</p> | <p>Points, Lines, & the Plane</p> <p>Geometric Problem Solving</p> |

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| | | | problems | Geometric Figures | Prisms, Cones & Pyramids |
| Geometry and Spatial Sense | G.8 Select and use different representational systems, including coordinate geometry | Coordinate Geometry | <p>MA.G.8.1 Use coordinate geometry to produce formulas and prove theorems for the midpoint of a line segment, the distance formula, and forms of equations of lines and circles</p> <p>MA.G.8.2 Describe the concept of rigid motion on figures in the coordinate plane, including rotation, translation, and reflection</p> | <p>Geometric Movement</p> <p>Geometric Movement</p> <p>Geometric Movement</p> | <p>The Coordinate Plane</p> <p>Transformations</p> <p>Overview</p> |
| Patterns, Functions, and Algebra | G.9 Understand various types of patterns and functional relationships | | There are no benchmarks for this standard for this Grade/Course. | | |
| Patterns, Functions, and Algebra | G.10 Use symbolic forms to represent, model, and analyze mathematical situations | | There are no benchmarks for this standard for this Grade/Course. | | |
| Data Analysis, Statistics, and Probability | G.11 Pose questions and collect, organize, and represent data to answer those questions | | There are no benchmarks for this standard for this Grade/Course. | | |
| Data Analysis, Statistics, and Probability | G.12 Interpret data using methods of exploratory data analysis | | There are no benchmarks for this standard for this Grade/Course. | | |
| Data Analysis, Statistics, and Probability | G.13 Develop and evaluate inferences, predictions, and arguments that are based on data | | There are no benchmarks for this standard for this Grade/Course. | | |
| Data Analysis, Statistics, and Probability | G.14 Understand and apply basic notions of chance and probability | | There are no benchmarks for this standard for this Grade/Course. | | |
| Numbers and Operations | A1.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems | Numbers and Number Systems | MA.A1.1.1 Use the complex number system, the notation for complex numbers, and the definition of "i" to solve problems | | |

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| Numbers and Operations | AII.2 Understand the meaning of operations and how they relate to each other | Operation Properties | MA.AII.2.1 Add, subtract, multiply, and divide complex numbers MA.AII.2.2 Use the inverse relationship between exponents and logarithms to solve exponential and logarithmic problems | | |
| Numbers and Operations | AII.3 Use computational tools and strategies fluently and, when appropriate, use estimation | Computational Fluency | MA.AII.3.1 Use matrix operations (i.e. multiplication and inverse) to solve problems | | |
| Measurement | AII.4 Understand attributes, units, and systems of units in measurement; and develop and use techniques, tools, and formulas for measuring | Measurement Formulas | MA.AII.4.1 Use advanced formulas or functions to solve problems dealing with determining a measurement based on another derived or given measure | Measurement Measurement Measurement | Area Volume Perimeter |
| Geometry and Spatial Sense | AII.5 Analyze properties of objects and relationships among the properties | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AII.6 Use transformations and symmetry to analyze mathematical situations | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AII.7 Use visualization and spatial reasoning to solve problems both within and outside of mathematics | | There are no benchmarks for this standard for this Grade/Course. | | |
| Geometry and Spatial Sense | AII.8 Select and use different representational systems, including coordinate geometry | | There are no benchmarks for this standard for this Grade/Course. | | |
| Patterns, Functions, and Algebra | AII.9 Understand various types of patterns and functional relationships | Patterns | MA.AII.9.1 Apply the properties of arithmetic and geometric sequences and series to solve problems | Algebraic Sense | Number Patterns |

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| | | Function | <p>MA.AII.9.2 Use exponential functions to solve problems involving exponential growth and decay</p> <p>MA.AII.9.3 Use the properties of many types of functions (e.g., polynomial, step, absolute value, step, exponential, and logarithmic) to identify the function's graph</p> <p>MA.AII.9.4 Use the appropriate terminology and notation to define functions and their properties (e.g., domain, range, function composition, inverses, zeros)</p> <p>MA.AII.9.5 Determine the zeros of a function algebraically or graphically</p> <p>MA.AII.9.6 Describe the relationship among relations and functions</p> <p>MA.AII.9.7 Determine the domain and range of a relation given a graph or a set of points</p> | | |
| Patterns, Functions, and Algebra | AII.10 Use symbolic forms to represent, model, and analyze mathematical situations | Numeric and Algebraic Representations | <p>MA.AII.10.1 Solve equations and inequalities involving absolute values</p> <p>MA.AII.10.2 Solve systems of linear equations and inequalities in two or three variables using a variety of strategies (e.g., substitution, graphing, matrices, technology)</p> | Algebraic Sense Algebraic Sense Algebraic Sense Algebraic Sense | Inequalities Graphing Inequalities Systems of two linear equations with two variables The Substitution Method to solve a system which has two linear equations and two variables The Substitution Method |

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| | | | <p>MA.AII.10.3 Solve equations containing radical and exponents</p> <p>MA.AII.10.4 Factor polynomials representing perfect squares, the difference in squares, perfect square trinomials, the sum and difference of cubes, and general trinomials</p> <p>MA.AII.10.5 Apply quadratic equations to real-world situations</p> <p>MA.AII.10.6 Solve quadratic equations in the complex number system</p> <p>MA.AII.10.7 Use the binomial theorem to expand binomial expression</p> <p>MA.AII.10.8 Add, subtract, multiply, divide, and simplify rational expressions, radical expressions containing positive rational numbers, and expressions containing rational exponents</p> <p>MA.AII.10.9 Translate between the equations of conic sections (e.g., circle, ellipse, parabola, hyperbola) and their graphs</p> <p>MA.AII.10.10 Analyze translations and dilations for graphs of absolute value functions, parabolas, and circles, and understand how the transformations are represented in equations</p> | Algebraic Sense | The Addition Method |
| Data Analysis, Statistics, and Probability | AII.11 Pose questions and collect, organize, and represent data to answer those questions | | There are no benchmarks for this standard for this Grade/Course. | | |



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| | AII.12 Interpret data using methods of exploratory data analysis | Data Interpretation | MA.AII.12.1 Identify trends in bivariate data and find functions that model the data | | |
| | AII.13 Develop and evaluate inferences, predictions, and arguments that are based on data | | There are no benchmarks for this standard for this Grade/Course. | | |
| | AII.14 Understand and apply basic notions of chance and probability | Probability | <p>MA.AII.14.1 Use the fundamental counting principles for combinations and permutations to determine probability</p> <p>MA.AII.14.2 Calculate probabilities of events under different relationships (e.g., inclusion, disjoint, complementary, independent, dependent, with replacement, without replacement)</p> | Probability 2 Probability 2 Introduction to Probability Introduction to Probability Introduction to Probability | Combinations Permutations Overview Experimental Probability Theoretical Probability |