

COMPONENT	OBJECTIVES	COMPETENCY
<p>I Number Sense and Operations</p>	<ol style="list-style-type: none"> 1. Knows word names and standard numerals for whole numbers, fractions, decimals (through hundred-thousandths), and percents. (M.A.A.1.3.1) 2. Reads and writes whole numbers and decimals in expanded form. (M.A.A.1.3.1) 3. Uses oral and written language to describe relationships and comparisons of rationals as related to order and position on the number line. (M.A.A.1.3.1) 4. Compares and orders fractions, decimals, integers, and common percents using graphic models, manipulatives, number lines and symbols. (M.A.A.1.3.2) 5. Uses oral and written language to illustrate the use of integers. (M.A.A.1.3.2) 6. Knows examples of positive rational numbers in real-world situations (include like and unlike fractions). (M.A.A.1.3.3) 7. Describes the meanings of positive rational numbers using part/whole relationships and relative size comparisons in real-world situations. (M.A.A.1.3.3) 8. Constructs models to represent positive rational numbers. (M.A.A.1.3.3) 9. Extends and explores applications and representations of fractions, decimals, percents, and integers. (M.A.A.1.3.3) 10. Knows the relationships among fractions, decimals, percents and integers. (M.A.A.1.3.4) 	<p>A. The student understands the different ways numbers are represented and used in the real world.</p>

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	<ol style="list-style-type: none"> 11. Expresses a given quantity in a variety of ways, such as fractions, decimals, integers or numbers expressed as percents. (MA.A.1.3.4) 12. Knows whether numbers expressed in different forms are equal. (MA.A.1.3.4) 13. Converts a number expressed in one form to its equivalent in another form. (MA.A.1.3.4) 14. Solves problems in which students need to interpret and evaluate numerical expressions including those involving exponents. (MA.A.2.3.2) 15. Compares the decimal number system to systems that do not use place value (for example, Roman numeral, ancient Egyptian). (MA.A.2.3.2) 16. Uses oral and written language to explain the effects of the four basic operations on whole numbers, fractions, mixed numbers, and decimals. (MA.A.3.3.1) 17. Uses models or pictures to show the of addition, subtraction, multiplication, and division, on whole numbers, decimals, fractions, and mixed numbers. (MA.A.3.3.1) 18. Knows and applies the commutative, associative, and distributive properties in the addition and multiplication of rational numbers. (MA.A.3.3.1) 19. Uses concrete models and real-world examples to explore the inverse relationship of positive and negative numbers. (MA.A.3.3.1) 	<p>B. The student understands number systems.</p> <p>C. The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.</p>

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	<p>20. Solves problems using different strategies, such as guess and check, draw diagrams, make lists, find patterns, make tables, work backwards, and solve simpler problems. (MA.A.3.3.1)</p> <p>21. Knows the appropriate operations to solve real-world problems involving whole numbers, decimals, and fractions. (MA.A.3.3.2)</p> <p>22. Uses ratios as comparisons. (MA.A.3.3.2)</p> <p>23. Solves real-world problems involving whole numbers, fractions, decimals, and common percents using one or two-step problems. (MA.A.3.3.2)</p> <p>24. Applies order of operations when solving problems (parentheses, multiplication, division, addition, and subtraction). (MA.A.3.3.2)</p> <p>25. Knows proportional relationships and describes such relationships in words, tables, or graphs. (MA.A.3.3.2)</p> <p>26. Uses proportional reasoning as a problem solving strategy. (MA.A.3.3.2)</p> <p>27. Develop, analyze and explain methods for solving proportions. (MA.A.3.3.2)</p> <p>28. Solves one- or two-step real-world problems involving whole numbers and decimals using appropriate methods of computation (for example, mental computation, paper and pencil, and calculator). (MA.A.3.3.3)</p> <p>29. Justifies the choice of method for calculations, such as mental computation, concrete materials, algorithms, or calculators. (MA.A.3.3.3)</p>	

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	<p>30. Knows an appropriate estimation technique for a given situation using whole numbers (for example, clustering, compatible number, front-end). (MA.A.4.3.1)</p> <p>31. Estimates to predict results and to check reasonableness of results. (MA.A.4.3.1)</p> <p>32. Determines whether an exact answer is needed or an estimate would be sufficient. (MA.A.4.3.1)</p> <p>33. Knows if numbers (equal to or greater than 100) are prime or composite. (MA.A.5.3.1)</p> <p>34. Finds the greatest common factor and least common multiple of two or more numbers. (MA.A.5.3.1)</p> <p>35. Determines the prime factorization of a number equal to or greater than 100. (MA.A.5.3.1)</p> <p>36. Explores divisibility rules using graphical models and manipulatives. (MA.A.5.3.1)</p> <p>37. Solves problems in which it is necessary to express numbers in factored form including prime factorization, factors, and multiples. (MA.A.5.3.1)</p> <p>38. Applies special number relationships such as sequence and series to real world problems. (MA.A.5.3.1)</p> <p>39. Uses concepts about numbers including primes, factors and multiples to build number sequences. (MA.A.5.3.1)</p>	<p>D. The student uses estimation in problem solving and computation.</p> <p>E. The student understands and applies theories related to numbers.</p>

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<p>II Measurement</p>	<ol style="list-style-type: none"> 1. Uses concrete and graphic models to create formulas for finding perimeter and area. (MA.B.1.3.1) 2. Uses concrete and graphic models to discover an approximation for pi and creates a formula for finding circumference. (MA.B.1.3.1) 3. Investigates relationships and/or differences among the various types and units of measurement (e.g., length, perimeter, area, and volume; calorie, gram, degree Celsius.) using models. (MA.B.1.3.1) 4. Applies formulas and procedures for determining measures to solve problems of area, surface area, circumference, and volume of 2 and 3 dimensional shapes including rectangular solids, cylinders, cones and pyramids. (MA.B.1.3.1) 5. Identifies a protractor as a tool for measuring angles, measures angles using a protractor and applies appropriate formulas to find arc lengths. (MA.B.1.3.2) 6. Identifies and names angles according to their measure (including acute, right, obtuse, straight). (MA.B.1.3.2) 7. Classifies triangles according to the measurement of their angles and according to the length of their sides. (MA.B.1.3.2) 8. Determines the measure of a missing angle using angle relationships. (MA.B.1.3.2) 9. Uses concrete and graphic models to derive formulas for finding rate. (MA.B.1.3.2) 	<p>A. The student measures quantities in the real world and uses the measures to solve problems.</p>

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	<p>10. Solves real world problems involving rated measures (miles per hour, feet per second, etc.) (MA.B.1.3.2)</p> <p>11. Given a two-dimensional figure, creates a new figure by increasing or decreasing the original dimensions. (MA.B.1.3.3)</p> <p>12. Knows the relationship between the area or perimeter of an original figure and that of a newly created figure. (MA.B.1.3.3)</p> <p>13. Solves real-world or mathematical problems involving perimeter or area and how these are affected by changes in the dimensions of the figure. (MA.B.1.3.3)</p> <p>14. Knows proportional relationships in scale drawings. (MA.B.1.3.4)</p> <p>15. Uses scale drawings to solve real-world problems including distance (as in map reading). (MA.B.1.3.4)</p> <p>16. Compares objects according to their length, weight or mass, and capacity using customary or metric units. (MA.B.2.3.1)</p> <p>17. Measures length, weight or mass, and capacity using appropriate measuring instruments. (MA.B.2.3.1)</p> <p>18. Uses measurement to describe and compare physical properties of objects. (MA.B.2.3.1)</p>	<p>B. The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).</p>

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	<p>19. Solves problems involving changes and conversions from one customary or metric unit of measurement to another within the same system. (MA.B.2.3.2)</p> <p>20. Uses concrete manipulatives or constructs models of square units (such as square inch and square meter) for measuring area and cubic units (such as cubic centimeter or cubic yard) for measuring volume. (MA.B.2.3.2)</p> <p>21. Estimates the measure (length, weight or mass, and capacity) of an object or figure and then compares the estimate with the actual measurement of the object or figure. (MA.B.3.3.1)</p> <p>22. Knows whether an exact answer is needed or an estimate is sufficient. (MA.B.3.3.1)</p> <p>23. Estimates solutions to real-world problems by estimating the length, volume or capacity, weight or mass, perimeter or area of objects or shapes in either customary or metric units. (MA.B.3.3.1)</p> <p>24. Estimates solutions to real-world problems involving measurement, including estimates of time, temperature and money. (MA.B.3.3.1)</p> <p>25. Selects the appropriate unit of measure for a given real-world situation. (MA.B.4.3.1)</p> <p>26. Knows the approximate nature of measurement and measures to the specified degree of accuracy (for example, nearest centimeter or sixteenth of an inch). (MA.B.4.3.1)</p>	<p>C. The student estimates measurements in real-world problem situations.</p> <p>D. The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.</p>

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<p>III Geometry and Spatial Sense</p>	<p>27. Uses non-standard units to estimate measurement to describe and compare quantitative phenomena in order to determine the approximate units of measure for a given task. (MA.B.4.3.1)</p> <p>28. Selects an appropriate measurement tool (for example, scales, rulers, thermometers, measuring cups, protractors, and gauges). (MA.B.4.3.2)</p> <p>29. Determines the interval of a scale and reads the scales on a variety of measuring instruments. (MA.B.4.3.2)</p> <p>30. Measures accurately with the measurement tools. (MA.B.4.3.2)</p> <p>1. Identifies, draws, and uses symbolic notation to denote the attributes of two-dimensional geometric figures (including points, parallel and perpendicular lines, tangency, planes, rays, and parts of a circle). (MA.C.1.3.1)</p> <p>2. Knows and draws angles (including acute, obtuse, right and straight). (MA.C.1.3.1)</p> <p>3. Analyzes relationships among two-dimensional geometric figures (for example, the diagonal of a rectangle divides the rectangle into two congruent triangles each having one half the area of the rectangle). (MA.C.1.3.1)</p> <p>4. Uses appropriate measuring devices (including ruler and protractor) as needed in analysis of figures. (MA.C.1.3.1)</p> <p>5. Knows the attributes of and draws three-dimensional figures (including rectangular solids and cylinders). (MA.C.1.3.1)</p>	<p>A. The student describes, draws, identifies, and analyzes two-and three-dimensional shapes.</p>

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	<ul style="list-style-type: none"> 6. Knows the properties of regular and irregular two- and three-dimensional figures. (M.A.C.1.3.1) 7. Communicates basic geometric ideas using basic terminology (such as point, line, plane, angle, parallel, perpendicular, midpoint, bisector, edge, face, radius and diameter) appropriate to geometric figures and shapes. (M.A.C.1.3.1) 8. Constructs plane figures (straight lines, angles, and triangles) using the appropriate tools and describe the resulting figure. (M.A.C.1.3.1) 9. Uses manipulatives and drawings to solve problems requiring spatial visualization. (M.A.C.2.3.1) 10. Describes and applies the property of symmetry in figures. (M.A.C.2.3.1) 11. Recognizes and draws congruent and similar figures. (M.A.C.2.3.1) 12. Identifies and performs the various transformations (reflection, translation, rotation) of a given figure on a coordinate plane. (M.A.C.2.3.1) 13. Predict and verify patterns involving tessellations. (M.A.C.2.3.2) 	<p>B. The student visualizes and illustrates ways in which shapes can be combined, subdivided and changed.</p>

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	<p>14. Observes, explains, and makes conjectures regarding geometric properties and relationships (among angles, triangles, squares, rectangles, parallelograms). (MA.C.3.3.1)</p> <p>15. Given a variety of regular polygons (triangle, square, pentagon, hexagon, etc.) investigates the relationship between the number of sides and the number of diagonals of any regular polygon. (MA.C.3.3.1)</p> <p>16. Applies known geometric properties (for example, symmetry, congruence) to solve real-world and mathematical problems. (MA.C.3.3.1)</p> <p>17. Identifies the x and y axes in a coordinate plane and identifies the coordinates of a given point in all four quadrants. (MA.C.3.3.2)</p> <p>18. Plots specific points in all four quadrants of the Cartesian coordinate system. (MA.C.3.3.2)</p> <p>19. Identifies and plots ordered pairs in all four quadrants of the coordinate system and applies simple properties of lines on a graph. (MA.C.3.3.2)</p> <p>20. Using the coordinate system, applies and algebraically verifies properties of two-dimensional figures including vertical and horizontal distance, midpoint and slope. (MA.C.3.3.2)</p>	<p>C. The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.</p>

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IV Algebraic Thinking	<ol style="list-style-type: none"> 1. Describes, predicts, and creates numerical and geometric patterns through models (for example, manipulatives, tables, graphs). (M.A.D.1.3.1) 2. States in words a rule for a pattern. (M.A.D.1.3.1) 3. Predicts outcomes based on patterns. (M.A.D.1.3.1) 4. Finds patterns in real-world situations. (M.A.D.1.3.1) 5. Describes relationships and patterns using words, tables, symbols, variables, expression, or equations. (M.A.D.1.3.1) 6. Supplies a specific missing term in a pattern given initial terms in the pattern (for example, given first four terms, supplies sixth term). (M.A.D.1.3.1) 7. Interprets and creates function table and graph (first quadrant). (M.A.D.1.3.2) 8. Substitutes values for variables and expressions and describes the results or patterns observed. (M.A.D.1.3.2) 9. Graphs (first quadrant) functions from function tables to explain cause-and-effect relationships. (M.A.D.1.3.2) 	<p>A. The student describes, analyzes, and generalizes a wide variety of patterns, relations and functions.</p>

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	<p>10. Uses variables to represent numbers and relationships. (M.A.D.2.3.1)</p> <p>11. Translates verbal expressions into algebraic expressions and number sentences (equations). (M.A.D.2.3.1)</p> <p>12. Translates simple algebraic expressions, equations or formulas representing real-world relationships into verbal expressions or sentences. (M.A.D.2.3.1)</p> <p>13. Uses pictures, models, manipulatives or other strategies to solve one-step linear equations with rational solutions. (M.A.D.2.3.1)</p> <p>14. Uses order of operations to simplify expressions and equations with variables. (M.A.D.2.3.1)</p> <p>15. Uses inverse operations to find the input for a given output. (M.A.D.2.3.1)</p> <p>16. Represents a physical situation using variables. (M.A.D.2.3.1)</p> <p>17. Represents and solves real world problems graphically, with algebraic expressions, equations, and inequalities. (M.A.D.2.3.1)</p> <p>18. Represents real world problem situations using finite graphs, matrices, sequences, series, and recursive relationships. (M.A.D.2.3.1)</p> <p>19. Uses systems of equations and inequalities to solve real world problems graphically, algebraically and with matrices. (M.A.D.2.3.1)</p>	<p>B. The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.</p>

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<p>V. Data Analysis and Probability</p>	<p>20. Knows how to solve simple equations representing real-world situations, using pictures, models, manipulatives (such as algebra tiles), or other strategies. (M.A.D.2.3.2)</p> <p>21. Uses concrete materials to solve equations and explain reasoning orally or in writing. (M.A.D.2.3.2)</p> <p>22. Solve and graph linear equations and linear inequalities in one variable. (M.A.D.2.3.2)</p> <p>1. Reads and analyzes data displayed in a variety of forms (charts, pictographs, stem-and-leaf plots). (M.A.E.1.3.1)</p> <p>2. Generates and collects data for analysis. (M.A.E.1.3.1)</p> <p>3. Chooses appropriate titles, scales, labels, keys, and intervals for displaying data in graphs. (M.A.E.1.3.1)</p> <p>4. Display data in a variety of forms and scales to determine how different ways of presenting data can lead to different interpretations. (M.A.E.1.3.1)</p> <p>5. Constructs, interprets, and explains displays of data, such as tables and graphs (single-and multiple-bar graphs and single- and multiple-line graphs) using collected experimental data. (M.A.E.1.3.1)</p> <p>6. Organizes items in a set of data. (M.A.E.1.3.2)</p> <p>7. Finds the range, mean, median, and mode of a set of data. (M.A.E.1.3.2)</p>	<p>A. The student understands and uses the tools of data analysis for managing information.</p>

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	<ul style="list-style-type: none"> 8. Describes real-world data by applying and explaining appropriate procedures for finding measures of central tendency and make predictions of larger populations. (MA.E.1.3.2) 9. Uses technology, such as graphing calculators and computer spreadsheets, to create graphs. (MA.E.1.3.3) 10. Determines all possible outcomes of events using a tree diagram or organized list. (MA.E.2.3.1) 11. Calculates mathematical probabilities for simple and compound events as well as independent and dependent events. (MA.E.2.3.1) 12. Uses manipulatives to obtain experimental results, compares results to mathematical expectations, and discusses the validity of the experiment. (MA.E.2.3.1) 13. Uses common fractions to describe the probability of an event. (MA.E.2.3.1) 14. Explores the concepts of measure of central tendency (mean, median, and mode) in real-world contexts. (MA.E.2.3.2) 15. Solves problems involving probability of occurrence of a given event in real-world context. (MA.E.2.3.2) 16. Examines and describes situations that include finding the odds for and against a specified outcome. (MA.E.2.3.2) 	<ul style="list-style-type: none"> B. The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics. C. The student uses statistical methods to make inferences and valid arguments about real-world situations.

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	<p>17. Formulates hypotheses, designs experiments, collects and interprets data, and evaluates hypotheses by making inferences and drawing conclusions based on statistics (range, median, mean, and mode), tables, graphs, and charts. (MA.E.3.3.1)</p> <p>18. Explains the limitations of using statistical techniques and data in making inferences and valid arguments. (MA.E.3.3.2)</p> <p>19. Identifies the common uses and misuses of probability and statistical analysis in the everyday world. (MA.E.3.3.2)</p>	