COMPONENT	OBJECTIVES	COMPETENCY
I Number Sense and Operations	1. Knows word names and standard numerals for integers, fractions, decimals, numbers expressed as percents, numbers with exponents, numbers expressed in scientific notation, radicals, and ratios. **(MA.A.1.3.1)** 2. Compares and orders fractions, decimals, integers, and radicals using graphic models, number lines, and symbols. **(MA.A.1.3.2)** 3. Compares and orders numbers expressed in absolute value, integers, percents, and numbers with exponents, fractions, decimals, radicals, and ratios. **(MA.A.1.3.2)** 4. Knows examples of rational and irrational numbers in real-world situations **(MA.A.1.3.3)** 5. Describes the meanings of rational and irrational numbers using physical or graphical displays. **(MA.A.1.3.3)** 6. Constructs models to represent rational and irrational numbers. **(MA.A.1.3.3)** 7. Knows the relationships among fractions, decimals, and percents given a real-world context. **(MA.A.1.3.4)** 8. Simplifies expressions using integers, exponents and radicals. **(MA.A.1.3.4)** 9. Knows equivalent forms of large and small numbers in standard and scientific notation. **(MA.A.1.3.4)** 10. Identifies and explains the absolute value of a number. **(MA.A.1.3.4)**	A The student understands the different ways numbers are represented and used in the real world.

COMPONENT	OBJECTIVES	COMPETENCY
	11. Expresses rational numbers in exponential notation, including negative exponents (for example: $49=7^2$). **(MA.A.2.3.1)** 12. Expresses numbers in scientific or standard notation including the decimals between 0 and 1. **(MA.A.2.3.1)** 13. Evaluates numerical or algebraic expressions that contain exponential notation. **(MA.A.2.3.1)** 14. Expresses base 10 numbers as equivalent numbers in different bases such as base 2, base 5, and base 8. **(MA.A.2.3.2)** 15. Discusses the application of the binary (base 2) number system in computer technology. **(MA.A.2.3.2)** 16. Expresses non-base 10 numbers as equivalent numbers in base 10. **(MA.A.2.3.2)**	B The student understands number systems.
	17. Knows the effects of the four basic operations on whole numbers, fractions, mixed numbers, decimals, and integers. **(MA.A.3.3.1)** 18. Knows the inverse relationship of positive and negative numbers. **(MA.A.3.3.1)** 19. Applies the properties of real numbers to solve problems (commutative, associative, distributive, identity, equality, inverse, and closure). **(MA.A.3.3.1)** 20. Knows the appropriate operations to solve real world problems involving integers, ratios, rates, proportions, numbers expressed as percents, decimals, and fractions. **(MA.A.3.3.2)**	C The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.

COMPONENT	OBJECTIVES	COMPETENCY
	21. Solves real world problems involving integers, ratios, proportions, numbers expressed as percents, decimals, and fractions in two or three step problems. **(MA.A.3.3.2)**	
	22. Solves real world problems involving percents including problems numbers greater than 100% (for example: percent of change, commission). **(MA.A.3.3.2)**	
	23. Writes and simplifies expressions from real world situations using the order of operations. **(MA.A.3.3.2)**	
	24. Solves multi-step real world problems involving fractions, decimals, and integers using appropriate methods of computation, such as mental computation, paper and pencil, calculator, and computers. **(MA.A.3.3.3)**	
	25. Knows appropriate estimation techniques for a given situation using real numbers. **(MA.A.4.3.1)**	D The student uses estimation in problem solving and computation.
	26. Estimates to predict results and to check reasonableness of results. **(MA.A.4.3.1)**	
	27. Knows if numbers are relatively prime. **(MA.A.5.3.1)**	E The student understands and applies theories related to numbers.
	28. Applies number theory concepts to determine the terms in a real number sequence. **(MA.A.5.3.1)**	
	29. Applies number theory concepts, including divisibility rules, to solve real-world or mathematical problems. **(MA.A.5.3.1)**	

COMPONENT	OBJECTIVES	COMPETENCY
	30. Solves problems using different strategies (guess and check, diagrams, lists, working backwards, etc). **(MA.A.5.3.1)**	
II Measurement	1. Uses concrete and graphic models to explore and derive formulas for surface area and volume of three-dimensional regular shapes, including pyramids, prisms, and cones. **(MA.B.1.3.1)** 2. Solves and explains real world problems involving surface area and volume of three-dimensional shapes. **(MA.B.1.3.1)** 3. Applies formulas for finding rates, distance, and angle measures. **(MA.B.1.3.2)** 4. Describes and uses rates of change (for example, temperature as it changes throughout the day, or speed as the rate of change of distance over time), and uses concrete and graphic models to derive formulas for finding rates, distance, time, and angle measures **(MA.B.1.3.2)** 5. Knows how a change in a figure's dimensions affects its perimeter, area, circumference, surface area, or volume. **(MA.B.1.3.3)** 6. Knows how changes in the volume, surface area, area, or perimeter of a figure affect the dimensions of the figure. **(MA.B.1.3.3)** 7. Interprets and applies various scales including those based on number lines, graphs, models, and maps. (Scale may include rational numbers.) **(MA.B.1.3.4)** 8. Constructs and uses scale drawings to recreate a given situation. **(MA.B.1.3.4)**	A The student measures quantities in the real world and uses the measures to solve problems.

COMPONENT	OBJECTIVES	COMPETENCY
	9. Finds measures of length, weight or mass, and capacity or volume using proportional relationships and properties of similar geometric figures. **(MA.B.2.3.1)** 10. Solves problems using mixed units within each system, such as feet and inches, hours and minutes. **(MA.B.2.3.2)** 11. Solves problems using the conversion of measurements within the customary system. **(MA.B.2.3.2)** 12. Solves problems using the conversions of measurement within the metric system. **(MA.B.2.3.2)**	B The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/ customary).
	13. Knows a variety of strategies to estimate, describe, make comparisons, and solve real-world and mathematical problems involving measurements. **(MA.B.3.3.1)** 14. Estimates measurement prior to computing length, area, volume/ capacity, and mass/weight in metric and/or customary units. **(MA.B.3.3.1)**	C The student estimates measurement in real-world problem situations.
	15. Selects the appropriate unit of measure for a given situation. **(MA.B.4.3.1)** 16. Knows the precision of different measuring instruments. **(MA.B.4.3.1)** 17. Determines the appropriate precision unit for a given situation. **(MA.B.4.3.1)**	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.

COMPONENT	OBJECTIVES	COMPETENCY
	18. Identifies the number of significant digits as it relates to the least precise unit of measure. **(MA.B.4.3.1)** 19. Determines the greatest possible error of a given measurement and the possible actual measurements of an object. **(MA.B.4.3.1)** 20. Applies significant digits in the real-world context. **(MA.B.4.3.2)** 21. Selects and uses appropriate instruments, technology, and techniques to measure quantities and dimensions to a specified degree of accuracy. **(MA.B.4.3.2)**	
III Geometry and Spatial Sense	1. Determines and justifies the measures of various types of angles based upon geometric relationships in two- and three-dimensional relationships. **(MA.C.1.3.1)** 2. Compares regular and irregular polygon and two- and three-dimensional shapes. **(MA.C.1.3.1)** 3. Draws and builds three-dimensional figures from various perspectives (for example, flat patterns, isometric drawings, and nets). **(MA.C.1.3.1)** 4. Knows the properties of two- and three-dimensional figures. **(MA.C.1.3.1)**	A The student describes, draws, identifies, and analyzes two- and three-dimensional shapes.

COMPONENT	OBJECTIVES	COMPETENCY
	5. Uses the properties of parallelism, perpendicularity, and symmetry in solving real-world problems. **(MA.C.2.3.1)** 6. Identifies congruent and similar figures in real-world situations and justifies the identifications. **(MA.C.2.3.1)** 7. Identifies and performs the various transformations (reflection, translation, dilation) of a given figure on a coordinate plane. **(MA.C.2.3.1)** 8. Predicts and verifies patterns involving tessellations (the covering of a congruent plane with the same pattern with no holes and no overlaps, like floor tiles). **(MA.C.2.3.2)**	B The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed.
	9. Observes, explains, makes and tests conjectures concerning geometric properties and relationships (among regular and irregular shapes of two- and three dimensions). **(MA.C.3.3.1)** 10. Applies the Pythagorean Theorem in real-world problems (for example, finds the relationship among sides in 45^{o}-45^{o}-90^{o} and 30^{o}-60^{o}–90^{o} right triangles). **(MA.C.3.3.1)** 11. Given an equation or its graph, finds ordered pair solutions (for example, $y = 2x$). **(MA.C.3.3.2)** 12. Given the graph of a line, identifies the slope of the line (including the slope of vertical and horizontal lines). **(MA.C.3.3.2)** 13. Given the graph of a linear relationship, determines the x and y intercepts of the line. **(MA.C.3.3.2)**	C The student uses coordinate geometry to locate objects in two- and three-dimensions and to describe objects algebraically.

COMPONENT	OBJECTIVES	COMPETENCY
	14. Given the graph of a linear relationship, applies and explains the property of lines on a graph. **(MA.C.3.3.2)**	
IV Algebraic Thinking	1. Reads, analyzes, and describes graphs of linear relationships. **MA.D.1.3.1)** 2. Uses variables to represent unknown quantities in real-world problems. **(MA.D.1.3.1)** 3. Uses the information provided in a table, graph, or rule to determine if a function is linear and justifies reasoning. **(MA.D.1.3.1)** 4. Finds a function rule to describe tables of related input-output variables. **(MA.D.1.3.1)** 5. Predicts outcomes based upon function rules. **(MA.D.1.3.1)** 6. Interprets and creates tables and graphs (function tables). **(MA.D.1.3.2)** 7. Writes equations and inequalities to express relationships. **(MA.D.1.3.2)** 8. Graphs equations and inequalities to explain cause-and-effect relationships. **(MA.D.1.3.2)** 9. Interprets the meaning of the slope of a line from a graph depicting a real-world situation. **(MA.D.1.3.2)**	A The student describes a wide-variety of patterns, relationships, and functions through models, such as manipulatives, tables, graphs, expressions, equations, and inequalities.

COMPONENT	OBJECTIVES	COMPETENCY
	10. Translates verbal expressions and sentences into algebraic expressions, equations, and inequalities. **(MA.D.2.3.1)** 11. Translates algebraic expressions, equations, or inequalities representing real-world relationships into verbal expressions or sentences. **(MA.D.2.3.1)** 12. Solves single- and multiple-step linear and systems of equations and inequalities in concrete or abstract form. **(MA.D.2.3.1)** 13. Graphs linear equations on the coordinate plane using tables of values. **(MA.D.2.3.1)** 14. Graphically displays real-world situations represented by algebraic equations or inequalities. **(MA.D.2.3.1)** 15. Evaluates algebraic expressions, equations, and inequalities by substituting integral values for variables and simplifying the results. **(MA.D.2.3.1)** 16. Simplifies algebraic expressions that represent real-world situations by combining like terms and applying the properties of real numbers. **(MA.D.2.3.1)** 17. Simplifies algebraic expressions with a maximum of two variables. **(MA.D.2.3.2)** 18. Solves single- and multi-step linear equations and inequalities that represent real-world situations. **(MA.D.2.3.2)** 19. Uses manipulatives to represent equations and polynomials. **(MA.D.2.3.2)** 20. Solves equations and inequalities in one variable involving rational numbers. **(MA.D.2.3.2)**	B The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

COMPONENT	OBJECTIVES	COMPETENCY
VI Data Analysis and Probability	1. Reads and interprets data displayed in a variety of forms including histograms. **(MA.E.1.3.1)** 2. Constructs and interprets displays of data, (Including circle, line, bar, and box-and whisker graphs) and explains how different displays of data can lead to different interpretations. **(MA.E.1.3.1)** 3. Finds the mean, median, and mode of a set of data. **(MA.E.1.3.2)** 4. Interprets measures of dispersion (range) and of central tendency. **(MA.E.1.3.2)** 5. Determines appropriate measures of central tendency for a given situation or set of data. **(MA.E.1.3.2)** 6. Determines the mean, median, mode and range of a set of real-world data using appropriate technology. **(MA.E.1.3.3)** 7. Organizes, graphs and analyzes a set of real-world data using appropriate technology. **(MA.E.1.3.3)**	A The student understands and uses the tools of data analysis for managing information.
	8. Compares and explains the results of an experiment with the mathematically expected outcomes. **(MA.E.2.3.1)** 9. Calculates simple mathematical probabilities for independent and dependent events. **(MA.E.2.3.1)** 10. Predicts the mathematical odds for and against a specified outcome in a given real-world situation. **(MA.E.2.3.2)**	B The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.

COMPONENT	OBJECTIVES	COMPETENCY
	11. Formulates a hypothesis and designs an experiment. **(MA.E.3.3.1)** 12. Performs the experiment and collects, organizes, and displays the data. **(MA.E.3.3.1)** 13. Evaluates the hypothesis by making inferences and drawing conclusions based on statistical results. **(MA.E.3.3.1)** 14. Knows appropriate uses of statistics and probability in real-world situations. **(MA.E.3.3.2)** 15. Knows when statistics and probability are used in misleading ways. **(MA.E.3.3.2)** 16. Identifies and uses different types of sampling techniques (for example, random, systematic, stratified). **(MA.E.3.3.2)** 17. Knows whether a sample is biased. **(MA.E.3.3.2)**	C The student uses statistical methods to make inferences and valid arguments about real-world situations.