NUMBER SENSE (NS)

Students know the properties of rational and irrational numbers expressed in a variety of forms. They understand and use exponents, power and roots.

2017	Standard
MA.PA.NS.1.	Read, write, compare and solve problems using decimals in scientific notation.
MA.PA.NS.2	Understand that computations with an irrational number and a rational number (other than zero) produce an irrational number.
MA.PA.NS.3	Understand and evaluate negative integer exponents.
MA.PA.NS.4	Use the laws of exponents for integer exponents.
MA.PA.NS.5	Calculate and find approximations of square roots.

COMPUTATION (C)

Students compute with rational numbers expressed in a variety of forms. They solve problems involving ratios, proportions and percentages.

2017	Standard
MA.PA.C.1	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) in multi-step problems.
MA.PA.C.2	Solve problems by computing simple and compound interest.
MA.PA.C.3	Use estimation techniques to decide whether the answers to computations on a calculator are reasonable.
MA.PA.C.4	Use mental arithmetic to compute with common fractions, decimals, powers, and percents.

ALGEBRA AND FUNCTIONS (AF)

Students solve simple linear equations and inequalities. They interpret and evaluate expressions involving integer powers. They graph and interpret functions. They understand the concepts of slope and rate.

2017	Standard
MA.PA.AF.1	Write and solve multi-step linear equations and inequalities including variables on each side.
MA.PA.AF.2	Interpret the solution(s) of the results of linear equations and inequalities in one variable in their context, verifying the reasonableness of the results.
MA.PA.AF.3	Solve systems of linear equations using the substitution method and identify approximate solutions graphically.
MA.PA.AF.4	Interpret positive integer powers as repeated multiplication and negative integer powers as repeated division or multiplication by the multiplicative inverse.
MA.PA.AF.5	Use the correct order of operations to find the values of algebraic expressions involving powers.
MA.PA.AF.6	Identify and graph linear functions, and identify lines with positive and negative slope.
MA.PA.AF.7	Find the slope of a linear function given the equation and write the equation of a line given the slope and any point on the line.
MA.PA.AF.8	Demonstrate an understanding of rate as a measure of one quantity with respect to another quantity.
MA.PA.AF.9	Demonstrate an understanding of the relationships among tables, equations, verbal expressions, and graphs of linear functions.
MA.PA.AF.10	Identify functions as linear or non-linear and examine their characteristics in tables, graphs, and equations.

GEOMETRY (G)

Students deepen their understanding of plane and solid geometric shapes and properties by constructing shapes that meet given conditions, by identifying attributes of shapes and by applying geometric concepts to solve problems.

2017	Standard
MA.PA.G.1	Identify and describe basic properties of geometric shapes: altitudes, diagonals, angle bisectors, perpendicular bisectors, central angles, radii, diameters, and chords of circles.
MA.PA.G.2	Perform simple constructions such as bisectors of segments and angles, copies of segments and angles, and perpendicular segments. Describe and justify the constructions.
MA.PA.G.3	Identify properties of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more figures intersect in a plane or in space.
MA.PA.G.4	Understand coordinate graphs using them to plot simples shapes and find images under translations (slide), rotations (turns), reflections (flips) and dilation (stretches & shrinks).
MA.PA.G.5	Use the Pythagorean Theorem and its converse to solve problems in two and three dimensions.

MEASUREMENT (M)

Students convert between units of measure and use rates and scale factors to solve problems. They compute the perimeter, area and volume of geometric objects. They investigate how perimeter, area and volume are affected by changes in scale.

2017	Standard
MA.PA.M.1	Convert common measurements for length, area, volume, weight, capacity, and time to equivalent measurements within the same system.
MA.PA.M.2	Solve simple problems involving rates and derived measurements for such attributes as velocity and density.
MA.PA.M.3	Solve problems involving scale factors, area, and volume using ratio and proportion.
MA.PA.M.4	Use formulas for find the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms, trapezoids, triangles, circles, prisms, cylinders, spheres, cones, and pyramids.
MA.PA.M.5	Estimate and compute the area and volume of irregular two- and three-dimensional shapes by breaking the shapes down into more basic geometric objects.

DATA ANALYSIS AND PROBABILITY (DP)

Students collect, organize, represent and interpret relationships in data sets that have one or mare variables. They determine probabilities and use them to make predictions about events.

2017	Standard
MA.PA.DP.1	Identify claims based on statistical data and, in simple cases, evaluate the reasonableness of the claims. Design a study to investigate the claim.
MA.PA.DP.2	Identify different methods of selecting samples, analyzing the strengths and weaknesses of each method, and the possible bias in a sample or display.
MA.PA.DP.3	Analyze, interpret, and display single- and two-variable data in appropriate bar, line and circle graphs, stem-and-leaf plots and box-and-whisker plots, and explain which types of display are appropriate for various data sets.
MA.PA.DP.4	Represent two-variable data with a scatterplot on the coordinate plane and describe how the data points are distributed. If the pattern appears to be linear, draw a line that appears to best fit the data, and write the equation of that line.
MA.PA.DP.5	Understand and recognize equally likely events.
MA.PA.DP.6	Find the number of possible arrangements of several objects by using the Basic Counting Principle.
MA.PA.DP.7	Describe the difference between combinations and permutations and their impact on the possible arrangements of several objects.