
SuccessMaker®

# New Jersey Student Learning Standards for Mathematics 2016 Grade 8

## Alignments to SuccessMaker

Providing rigorous intervention
for K-8 learners with unparalleled precision

| New Jersey Student Learning Standards for Mathematics 2016 Grade 8 | Item Code | SuccessMaker Item Description |
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| (8.NS) The Number System | | |
| (8.NS.A) Know that there are numbers that are not rational, and approximate them by rational numbers. | | |
| (8.NS.A.2) Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi^2$). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. | SMMA_LO_02141 | Drag rational and irrational values to their correct positions on a number line. |
| (8.EE) Expressions and Equations | | |
| (8.EE.A) Work with radicals and integer exponents. | | |
| (8.EE.A.1) Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. | SMMA_LO_01104 | Multiply or divide two numbers with exponents (same base, exponents less than 18). |
| | SMMA_LO_01111 | Find the missing exponent in a multiplication or division number sentence. |
| (8.EE.A.2) Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. | SMMA_LO_01120 | Find the square root of a number using a calculator (numbers to 4000). |
| (8.EE.A.3) Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to | SMMA_LO_02070 | Write very small numbers in scientific notation. |

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| express how many times as much one is than the other. For example, estimate the population of the United States as $3 \times 10^8$ and the population of the world as $7 \times 10^9$, and determine that the world population is more than 20 times larger. | | |
| | SMMA_LO_02071 | Write very large numbers in scientific notation. |
| | SMMA_LO_02072 | Compare numbers written in scientific notation. |
| | SMMA_LO_02515 | Student do operations in scientific notations and convert to and from scientific notation. |
| (8.EE.A.4) Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. | SMMA_LO_01113 | Express a number in scientific notation (exponents 1 to 6). |
| | SMMA_LO_01121 | Given the scientific notation, determine the standard notation of a number (the power of 10 has an exponent of 1 to 6). |
| | SMMA_LO_01122 | Find the missing exponent for a number written in scientific notation (the exponent is 1 to 6). |
| (8.EE.B) Understand the connections between proportional relationships, lines, and linear equations. | | |
| (8.EE.B.5) Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance- | SMMA_LO_02073 | Graph proportional relationships and interpret the unit rate as the slope of the graph. |

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| time equation to determine which of two moving objects has greater speed. | | |
| | SMMA_LO_02074 | Compare a proportional relationship represented as a graph to a proportional relationship represented as a table. |
| | SMMA_LO_02516 | Students write, graph, and compare two linear functions. |
| (8.EE.B.6) Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. | SMMA_LO_02075 | Use similar triangles to explain why the slope m is the same between any two distinct points on a nonvertical line in the coordinate plane. |
| | SMMA_LO_02076 | Derive the equation y = mx for a line through the origin, and y = mx + b for a line intercepting the vertical axis at b. |
| (8.EE.C) Analyze and solve linear equations and pairs of simultaneous linear equations. | | |
| (8.EE.C.7) Solve linear equations in one variable. | | |
| (8.EE.C.7a) Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). | SMMA_LO_02079 | Transform a given multi-step equation into a simpler form. |
| (8.EE.C.7b) Solve linear equations with rational number coefficients, including equations whose solutions | SMMA_LO_02145 | Generate and solve an equation with variables on both sides of the equal sign in a real-world context. |

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| require expanding expressions using the distributive property and collecting like terms. | | |
| (8.EE.C.8) Analyze and solve pairs of simultaneous linear equations. | | |
| (8.EE.C.8a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. | SMMA_LO_02080 | Identify the solution to a system of linear equations by locating the point of intersection on its graph. |
| (8.EE.C.8b) Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.<br>For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. | SMMA_LO_02133 | If a system of linear equations has 0 or infinitely many solutions, solve it by inspection. If it has 1 solution, solve it either algebraically or by graphing. |
| (8.EE.C.8c) Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. | SMMA_LO_02134 | Model a real-world problem with a system of linear equations. Then solve it by locating the intersection point of the graphs of the two equations. |
| (8.F) Functions | | |
| (8.F.A) Define, evaluate, and compare functions. | | |
| (8.F.A.1) Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8. | SMMA_LO_01811 | Given a list of ordered pairs of a relation, identify two ordered pairs that show the relation is not a function. |
| | SMMA_LO_01812 | Given a graph of a relation, identify two ordered pairs on the graph that show the relation is not a function. |
| | SMMA_LO_01835 | Given a set of graphs of relations, identify which graphs represent |

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| | | functions. |
| | SMMA_LO_01682 | Identify the addition or subtraction rule of the function. |
| | SMMA_LO_01684 | Identify the multiplication or division rule of the function. |
| | SMMA_LO_01722 | Identify the one-step rule in the relation or function (addition and subtraction). |
| | SMMA_LO_01723 | Identify the one-step rule in the relation or function (multiplication and division). |
| | SMMA_LO_01724 | Generate a table of values given a rule. |
| | SMMA_LO_01742 | Identify an expression to describe the pattern generated by a table. |
| | SMMA_LO_01752 | Identify a two-step expression to describe the pattern generated by a table (input = 100). |
| | SMMA_LO_01753 | Identify a two-step expression to describe the pattern generated by a table (input = 1000). |
| | SMMA_LO_01757 | Complete an input/output table given a one-step rule; then plot the ordered pairs on a coordinate grid. |
| | SMMA_LO_01836 | Complete a table of values and graph the equation of a quadratic function. |
| | SMMA_LO_01837 | Complete a table of values and graph the equation of a linear function. |
| (8.F.A.2) Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Example:: For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. | SMMA_LO_02101 | Identify the rate of change and the y-intercept of two linear functions, one represented graphically, and one represented either algebraically or in a table. |
| | SMMA_LO_02102 | Identify the rate of change and the y-intercept of two linear functions, one |

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| | | represented in a verbal description, and one represented either graphically or algebraically. |
| | SMMA_LO_02103 | Identify the rate of change and the y-intercept of two linear functions, one represented in a table, and one represented either algebraically or in a verbal description. |
| (8.F.A.3) Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. Example:: For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. | SMMA_LO_01828 | Identify if an equation is a linear or exponential function. |
| | SMMA_LO_01829 | Identify if an equation is a linear or quadratic function. |
| | SMMA_LO_01831 | Identify whether graphs are linear or quadratic. |
| | SMMA_LO_01832 | Identify whether graphs are linear or nonlinear. |
| | SMMA_LO_01833 | Identify if an equation is a linear or nonlinear function. |
| | SMMA_LO_01834 | Determine if a table values represents a linear or nonlinear function. |
| | SMMA_LO_01881 | Determine if a table values represents a linear or exponential function. |
| | SMMA_LO_01882 | Determine if a table values represents a linear or quadratic function. |
| | SMMA_LO_01883 | Identify the function that is represented by a table of values (linear and nonlinear). |
| (8.F.B) Use functions to model relationships between quantities. | | |
| (8.F.B.4) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a | SMMA_LO_01806 | Complete an input/output table and identify the algebraic equation that describes the one-step rule. |

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| relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. | | |
| | SMMA_LO_01807 | Complete an input/output table and identify the algebraic equation that describes the two-step rule. |
| | SMMA_LO_02517 | Students write and graph a function from a table, intercepting the slope and x- and y-intercepts. |
| (8.F.B.5) Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally. | SMMA_LO_01830 | Identify whether graphs are linear or exponential. |
| (8.G) Geometry | | |
| (8.G.A) Understand congruence and similarity using physical models, transparencies, or geometry software. | | |
| (8.G.A.1) Verify experimentally the properties of rotations, reflections, and translations: | SMMA_LO_00599 | Identify a figure as a slide, reflection (flip), or turn of another figure. |
| | SMMA_LO_00637 | Identify congruent angles. |
| | SMMA_LO_00648 | Identify a set of geometric figures that show a reflection (flip). |
| | SMMA_LO_00665 | Identify a reflection, a rotation, and a translation of a geometric figure. |
| | SMMA_LO_01776 | Identify a transformation as a slide, flip, or a turn. |
| (8.G.A.1a) Lines are transformed to | SMMA_LO_02104 | Rotate a figure by 90, 180, or 270 |

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| lines, and line segments to line segments of the same length. | | degrees clockwise or counterclockwise on a coordinate plane. |
| | SMMA_LO_02105 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x. |
| | SMMA_LO_02120 | Translate a figure on a coordinate plane. |
| | SMMA_LO_02121 | Rotate a figure on a coordinate plane; verify properties of the rotation. |
| | SMMA_LO_02122 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x; verify properties of the rotation. |
| | SMMA_LO_02123 | Translate a figure on a coordinate plane; verify properties of the rotation. |
| (8.G.A.1b) Angles are transformed to angles of the same measure. | SMMA_LO_02105 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x. |
| | SMMA_LO_02105 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x. |
| | SMMA_LO_02104 | Rotate a figure by 90, 180, or 270 degrees clockwise or counterclockwise on a coordinate plane. |
| | SMMA_LO_02123 | Translate a figure on a coordinate plane; verify properties of the rotation. |
| | SMMA_LO_02104 | Rotate a figure by 90, 180, or 270 degrees clockwise or counterclockwise on a coordinate plane. |
| | SMMA_LO_02120 | Translate a figure on a coordinate plane. |
| | SMMA_LO_02121 | Rotate a figure on a coordinate plane; verify properties of the rotation. |
| | SMMA_LO_02122 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x; verify properties of the rotation. |
| (8.G.A.1c) Parallel lines are transformed to parallel lines. | SMMA_LO_02120 | Translate a figure on a coordinate plane. |

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| | SMMA_LO_02121 | Rotate a figure on a coordinate plane; verify properties of the rotation. |
| | SMMA_LO_02122 | Reflect a figure on a coordinate plane over the x-axis, the y-axis, or the line y = x; verify properties of the rotation. |
| | SMMA_LO_02123 | Translate a figure on a coordinate plane; verify properties of the rotation. |
| (8.G.A.2) Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. | SMMA_LO_02124 | Given two congruent figures, transform one figure so that it lines up with the other. Then, identify the sequence of transformations used. |
| | SMMA_LO_00600 | Identify the figure that is the same size and shape as a given figure. |
| | SMMA_LO_00606 | Identify congruent figures on a geoboard. |
| (8.G.A.3) Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. | SMMA_LO_02125 | Reflect a figure, find the coordinates of the reflected figure, and describe the effect of the reflection on the coordinates. |
| | SMMA_LO_02142 | Determine the algebraic expression used to find the coordinates of the image of a figure under a dilation with the origin as the center of dilation. |
| | SMMA_LO_01736 | Determine the missing coordinate of a vertex of a triangle in a transformation. |
| (8.G.A.4) Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. | SMMA_LO_00645 | Identify the polygon that is not similar to the others (counterexample) |
| | SMMA_LO_00649 | Identify the figure that is not similar |

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| | | to the others. (simple shapes, counterexample) |
| | SMMA_LO_00847 | Identify similar triangles or rectangles on a geoboard. |
| | SMMA_LO_00610 | Identify similar polygons. |
| | SMMA_LO_00618 | Identify two figures as being similar, congruent, or neither. |
| (8.G.A.5) Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. | SMMA_LO_00672 | Establish that alternate interior angles are congruent for parallel lines. |
| | SMMA_LO_02126 | Arrange statements to write a proof of a fact about either the angle sum or the exterior angle of a triangle. |
| | SMMA_LO_02129 | In a figure in which parallel lines are cut by a transversal, identify the transformations that would line one angle up with another angle. Then, describe the relationship between the two angles. |
| | SMMA_LO_02130 | Determine whether or not a diagram gives enough information to determine whether or not two triangles are similar. If so, identify the triangles as similar or not similar. |
| | SMMA_LO_00635 | Count the points of intersection of two or more lines (0 to 5 intersection points). |
| (8.G.B) Understand and apply the Pythagorean Theorem. | | |
| (8.G.B.6) Explain a proof of the Pythagorean Theorem and its converse. | SMMA_LO_02132 | Explain a proof of the converse of the Pythagorean Theorem. |
| (8.G.B.7) Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real- world and mathematical problems in two and three dimensions. | SMMA_LO_01854 | Find the measurement of the hypotenuse using the Pythagorean theorem. (2D) |
| (8.G.B.8) Apply the Pythagorean | SMMA_LO_02100 | Given two points on a coordinate grid, |

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| Theorem to find the distance between two points in a coordinate system. | | draw a right triangle whose hypotenuse connects the two points. Then use the Pythagorean Theorem to find the distance between the two points. |
| (8.G.C) Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. | | |
| (8.G.C.9) Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | SMMA_LO_00839 | Use a formula to find the volume of a cylinder. |
| | SMMA_LO_00844 | Use a formula to find the volume of a cone or a sphere. |
| (8.SP) Statistics and Probability | | |
| (8.SP.A) Investigate patterns of association in bivariate data. | | |
| (8.SP.A.1) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | SMMA_LO_01222 | Identify positive, negative, or no association for sets of actual data. |
| (8.SP.A.3) Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. Example:: For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. | SMMA_LO_02143 | Choose an approximation based on a trend line for bivariate data. |