Grade 8 EOY

Evidence Statement Key	Evidence Statement Text	Clarifications	MP	Calculator
8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	i) Tasks do not have a context. ii) 50% of tasks require students to write a fraction a/b as a repeating decimal by showing, filling in, or otherwise producing the steps of a long division $a \div b$. iii) 50% of tasks require students to write a given repeating decimal as a fraction. iv) Tasks should involve no more than two repeating decimals i.e. 2.16666…, 0.23232323…	7, 8	No
8.NS.2	Use rational approximations of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^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.*	i) Tasks do not have a context.	5, 7, 8	No
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = \frac{1}{3^3} = \frac{1}{27}$.	i) Tasks do not have a context. ii) Tasks center on the properties and equivalence, not on simplification. For example, a task might ask a student to classify expressions according to whether or not they are equivalent to a given expression. iii) 50% of expressions should involve one property iv) 30% of expressions should involve two properties v) 20% of expressions should involve three properties vi) Tasks should involve a single common base	7	No

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8.EE.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.	i) Pool should contain tasks with and without contexts. ii) Tasks might for example take the form of algebraic word problems leading to equations $x^2 = p$ or $x^3 = p$, or geometric problems such as finding the edge length of a cubical object with a given volume. iii) In problems where $\sqrt{p}$ and $-\sqrt{p}$ are both relevant as solutions to $x^2 = p$, both of these solutions should be given. Note that $\sqrt{p}$ is nonnegative by definition. iv) Solutions to equations $x^2 = p$ or $x^3 = p$ are represented as $\sqrt{p}$ and $-\sqrt{p}$ or $\sqrt[3]{p}$, respectively. v) Manipulations such as $\sqrt{8} = 2\sqrt{2}$ are beyond the scope of grade 8. Student need not simplify a solution such as $\sqrt{8}$. But students should ultimately express the following cases in the form of whole numbers: (a) the square roots of 1, 4, 9, 16, 25, 36, 49, 64, 81, and 100; (b) the cube roots of 1, 8, 27, and 64.	-	No
8.EE.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 express how many times as much one is than the other. *For example estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9, *and determine that the world population is more than 20 times larger.*	None	4	No

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8.EE.4-1	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.	i) Tasks have "thin context" or no context. ii) Rules or conventions for significant figures are not assessed. iii) 20% of tasks involve both decimal and scientific notation, e.g., write $120+3\times10^4$ in scientific notation.	6, 7, 8	No
8.EE.4-2	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.	i) Task have "thin context". ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks. iii) Tasks may require students to recognize 3.7E-2 (or 3.7e-2) from technology as 3.7×10^{-2}	6, 7, 8	Yes
8.EE.5-1	Graph proportional relationships, interpreting the unit rate as the slope of the graph.	i) Pool should contain task with and without contexts. ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	1, 5	Yes
8.EE.5-2	Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has a greater speed.*	i) Pool should contain tasks with and without contexts. ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	7	Yes
8.EE.6-1	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.	i) Tasks do not have a context. ii) Given a non-vertical line in the coordinate plane, tasks might for example require students to choose two pairs of points and record the rise, run, and slope relative to each pair and verity that they are the same. iii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	2, 7	Yes
8.EE.7b	Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	i) Tasks do not have a context	6, 7	No
8.EE.8a	Analyze and solve pairs of simultaneous linear equations. a. 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.	i) Tasks do not have a context	2, 5, 6, 7	No

Evidence Statement Key	Evidence Statement Text	Clarifications	MP	Calculator
8.EE.8b-1	Analyze and solve pairs of simultaneous linear equations. b. Solve systems of two linear equations in two variables algebraically.	i) 20% of tasks have a zero coefficient, e.g., as in the system $-s+\frac{3}{4}t=2,\ t=6$. ii) 20% of tasks have non-zero whole-number coefficients, and whole-number solutions. iii) 20% of tasks have non-zero whole-number coefficients, and at least one fraction among the solutions. iv) 20% of tasks have non-zero integer coefficients (with at least one coefficient negative). v) 20% of tasks have non-zero rational coefficients (with at least one coefficient negative and at least one coefficient a non-integer).	1, 6, 7	No
8.EE.8b-2	Analyze and solve pairs of simultaneous linear equations. b. Estimate solutions [to systems of two linear equations in two variables] by graphing the equations.	i) Tasks present students with technology that allows them to (1) graph a point based on coordinates of their choosing; (2) graph a line based on the equation (3) zoom in if the student wishes to do so, rescaling the axes automatically. ii) 20% of tasks have a zero coefficient, e.g., as in the system $-s + (3/4)t = 2$, $t = 6$. iii) 20% of tasks have non-zero whole-number coefficients, and whole-number solutions. iv) 20% of tasks have non-zero whole-number coefficients, and at least one fraction among the solutions. v) 20% of tasks have non-zero integer coefficients (with at least one coefficient negative). vi) 20% of tasks have non-zero rational coefficients (with at least one coefficient a non-integer).	5, 6, 7	No

Evidence Statement Key	Evidence Statement Text	Clarifications	MP	Calculator
8.EE.8b-3	Analyze and solve pairs of simultaneous linear equations. b. Solve simple cases [of systems of two linear equations in two variables] by inspection. *For example,* $3x+2y=5$ *and* $3x+2y=6$ *have no solution because* $3x+2y$ *cannot simultaneously be* 5 *and* 6*.*	i) Tasks have whole-number or integer coefficients, one coefficient in either or both equations possibly zero. ii) One-third of tasks involve inconsistent systems, where the inconsistency is plausibly visible by inspection as in the italicized example given in the standard 8.EE.8b. iii) One-third of tasks involve degenerate systems (infinitely many solutions), where the degeneracy is plausibly visible by inspection, as for example in $3x+3y=1,\ 6x+6y=2$. iv) One-third of tasks involve systems with a unique solution and one coefficient zero, where the solution is plausibly visible by inspection, as for example in $y=1,\ 3x+y=1$. v) Tasks assess solving by inspection, for example by listing several systems and asking the student for the solution of any freely chosen one of them by inspection.	7	No
8.EE.8c	Analyze and solve pairs of simultaneous liner equations. c. 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.*	i) Mixture problems are no more than 20% of tasks. ii) For an example of an illustrative task, see ITN Appendix F, section A, "Illustrations of innovative task characteristics," sub-section 6, "Expressing mathematical reasoning," sub-section "Illustrative tasks that require students to express mathematical reasoning," the problem of the two shepherds.	1, 5, 6, 7	Yes
8.EE.C.Int.1	Solve word problems leading to linear equations in one variable whose solutions require expanding expressions using the distributive property and collecting like terms.	i) For an example of an illustrative task, see 2009 CCRS: "If a bar of soap balances 3/4 of a bar of soap and 3/4 of a pound, how much does the bar of soap weigh?" At least 80% of tasks should involve contextual word problems (a noncontextual word problem could be "the sum of two times a number and 8 is 16").	4, 6, 7	Yes
8.F.1-1	Understand that a function is a rule that assigns to each input exactly one output.	i) Tasks do not involve the coordinate plane or the "vertical line test." ii) Tasks do not require knowledge of the concepts or terms domain and range. iii) 20% of functions in tasks are non-numerical, e.g., the input could be a person and the output could be his or her month of birth.	2	No

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8.F.1-2	[Understand that] the graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	i) Functions are limited to those with inputs and outputs in the real numbers. ii) Tasks do not require knowledge of the concepts or terms domain and range. iii) 80% of tasks require students to graph functions in the coordinate plane or read inputs and outputs from the graph of a function in the coordinate plane. iv) 20% of tasks require students to tell whether a set of points in the plane represents a function.	2, 5	No
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in table, or by verbal descriptions). *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 greatest rate of change.*	i) Tasks have “thin context” or no context. ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	2, 5	Yes
8.F.3-1	Interpret the equation, $y = mx + b$ as defining a linear function, whose graph is a straight line.	i) Tasks have “thin context” or no context. ii) Tasks require students to approach linear equations from a functional perspective, for example by computing outputs from inputs or by identifying equations that do or do not define one variable as a linear function of the other. iii) Equations can be presented in forms other than $y = mx + b$. For example, the equation $2x + 2y = 7$ can be viewed as a function machine with *x* the input and *y* the output - or as a function machine with *y* the input and *x* the output.	2, 7	No
8.F.3-2	Give examples of functions that are not linear and prove that they are not linear.	i) Tasks have “thin context” or no context. ii) Tasks require students to demonstrate understanding of function nonlinearity, for example by recognizing or producing equations that do not define linear functions, or by recognizing or producing pairs of points that belong to the graph of the function yet do not lie on a straight line. iii)Tasks do not require students to produce a proof; for that aspect of standard 8.F.3, see Grade 8 PBA Part 2). iv)Tasks involving symbolic representations are limited to polynomial functions i.e. y = 3x2 + 2nts to produce a proof.	7	No

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8.F.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 relationship or from two (x,y) values, including reading these from a table or from a graph.	i) Pool should contain tasks with and without contexts. ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	2, 4	Yes
8.F.5-1	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear).	i) Pool should contain tasks with and without contexts.	2, 5	No
8.F.5-2	Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	i) Pool should contain tasks with and without contexts.	2, 5, 7	No
8.G.1a	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length.	i) Tasks do not have a context.	3, 5, 8	No
8.G.1b	Verify experimentally the properties of rotations, reflections, and translations: b. Angles are taken to angles of the same measure.	i) Tasks do not have a context.	3, 5, 8	No
8.G.1c	Verify experimentally the properties of rotations, reflections, and translations: c. Parallel lines are taken to parallel lines.	i) Tasks do not have a context.	3, 5, 8	No
8.G.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.	i)Tasks do not have a context. ii)Tasks do not reference similarity (this relationship will be assessed in 8.C.3.2) iii)Tasks should not focus on coordinate Geometry Tasks should elicit student understanding of the connection between congruence and transformations i.e., tasks may provide two congruent figures and require the description of a sequence of transformations that exhibits the congruence or tasks may require students to identify whether two figures are congruent using a sequence of transformations.	2, 7	No

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8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	i)Tasks have "thin context" or no context. ii)Tasks require the use of coordinates in the coordinate plane iii)For items involving dilations, tasks must state the center of dilation.	2, 3, 5	No
8.G.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.	i)Tasks do not have a context. ii)Tasks do not reference congruence (this relationship will be assessed in 8.C.3.2) iii)Tasks should not focus on coordinate Geometry iv)Tasks should elicit student understanding of the connection between similarity and transformations i.e., tasks may provide two similar figures and require the description of a sequence of transformations that exhibits the similarity or tasks may require students to identify whether two figures are similar using a sequence of transformations. v)Tasks do not require students to indicate a specified scale factor. vi)Similarity should not be obtained through the proportionality of corresponding sides.	2, 7	No
8.G.7-1	Apply the Pythagorean Theorem in a simple planar case.	i) Tasks have "thin context" or no context. ii) Tasks require students to find one side of a right triangle in the plane, given the other two sides. iii) In 50% of tasks, the answer is a whole number and is to be given as a whole number. iv) In 50% of tasks, the answer is irrational and is to be given approximately to three decimal places. v) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	-	Yes
8.G.7-2	Apply the Pythagorean Theorem in a simple three-dimensional case.	i) Tasks have "thin context" or no context. ii) Tasks require students to find one side of a right triangle in three dimensions, given information on a diagram that straightforwardly determines the other two sides. iii) In 50% of tasks, the answer is a whole number and is to be given as a whole number. iv) In 50% of tasks, the answer is irrational and is to be given approximately to three decimal places. v) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	-	Yes

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8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	i) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	-	Yes
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	i) The testing interface can provide students with a calculation aid of the specified kind for these tasks. ii) The testing interface can include a formula sheet with the indicated formulas to jog the student's	1, 5	Yes
8.SP.1	Construct and interpret scatterplots 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.	i) Tasks might have spreadsheet-like technology features, such as the ability to select data ranges for the two axes and have the scatterplot automatically generated.	3, 5, 7	No
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatterplots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	i) Tasks might have technology features such as the ability to adjust the position of a line and rotate it. ii) Tasks do not require students to write or identify an equation.	2, 5, 7	No
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *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.*	i) Tasks are word problems based on bivariate measurement data that require students to use the equation of a linear model. ii) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	2, 4, 6, 7	Yes
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. *For example, collect data from students in your class on whether or not they have a curfew on school nights, or whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	i) One-third of tasks involve basic comprehension questions about a two-way table, such as "How many students who don't have chores have a curfew?". ii) One-third of tasks involve computing marginal sums or marginal percentages. iii) One third of tasks involve interpretation or patterns of association. iv) Tasks that require finding missing values within the categories are excluded. v) Tasks are limited to two-by-two tables. vi) The testing interface can provide students with a calculation aid of the specified kind for these tasks.	2, 4, 5, 7	Yes