

# BENCHMARK REPORT

## MATHEMATICS GRADE 8



<b>DOMAIN: Standards for Mathematical Content</b>		
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>The Number System (NS)</i></b>
	<b>8.SMC.NS.1</b>	<b>Know that there are numbers that are not rational, and approximate them by rational numbers.</b>
Supporting	8.SMC.NS.1.1-1.a	Show that numbers that are not rational are irrational
Supporting	8.SMC.NS.1.1-2.a	Show that every number has a decimal expansion
Supporting	8.SMC.NS.1.1-3.a	Show that for rational numbers the decimal expansion repeats eventually
Supporting	8.SMC.NS.1.1-4.a	Convert a decimal expansion which repeats eventually into a rational number
Supporting	8.SMC.NS.1.2-1.b	Compare rational approximations of irrational numbers to the size of irrational numbers
Supporting	8.SMC.NS.1.2-2.b	Locate rational approximations of irrational numbers on a number line diagram
Supporting	8.SMC.NS.1.2-3.b	Estimate the value of expressions by using rational approximations of irrational numbers
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Expressions and Equations (EE)</i></b>
	<b>8.SMC.EE.1</b>	<b>Work with radicals and integer exponents.</b>
Supporting	8.SMC.EE.1.1-1.a	Show that the properties of integer exponents generate equivalent numerical expressions
Supporting	8.SMC.EE.1.1-2.a	Apply the properties of integer exponents to generate equivalent numerical expressions
Supporting	8.SMC.EE.1.2-1.b	Use square root symbols to represent solutions to equations of the form $x^2 = p$ , where $p$ is a positive rational number
Supporting	8.SMC.EE.1.2-2.b	Use cube root symbols to represent solutions to equations of the form $x^3 = p$ , where $p$ is a positive rational number
Supporting	8.SMC.EE.1.2-3.b	Evaluate square roots of small perfect squares
Supporting	8.SMC.EE.1.2-4.b	Evaluate cube roots of small perfect cubes
Supporting	8.SMC.EE.1.3-1.b	Estimate large or small quantities using numbers expressed in the form of a single digit times a whole-number power of 10
Supporting	8.SMC.EE.1.3-2.b	Compare large quantities to small quantities expressed in the form of a single digit times a whole-number power of 10
Supporting	8.SMC.EE.1.4-1.c	Perform operations with numbers expressed in scientific notation
Supporting	8.SMC.EE.1.4-2.c	Choose units of appropriate size for measurements of large or small quantities using scientific notation
Supporting	8.SMC.EE.1.4-3.c	Interpret numbers that have been expressed in scientific notation which have been generated by technology
	<b>8.SMC.EE.2</b>	<b>Understand the connections between proportional relationships, lines, and linear equations.</b>
Supporting	8.SMC.EE.2.1-1.b	Graph proportional relationships
Supporting	8.SMC.EE.2.1-2.b	Interpret the unit rate as the slope of a graph showing a proportional relationship
Supporting	8.SMC.EE.2.1-3.b	Compare two different proportional relationships represented in different ways
Supporting	8.SMC.EE.2.2-1.b	Use similar triangles to show that the slope $m$ is the same between any two distinct points on a non-vertical line in the coordinate plane
Supporting	8.SMC.EE.2.2-2.b	Derive the equation $y = mx$ for a line through the origin
Supporting	8.SMC.EE.2.2-3.b	Derive the equation $y = mx + b$ for a line intercepting the vertical axis at $b$
	<b>8.SMC.EE.3</b>	<b>Analyze and solve linear equations and pairs of simultaneous linear equations.</b>
Supporting	8.SMC.EE.3.3-1.b	Create linear equations in one variable with one solution
Supporting	8.SMC.EE.3.3-2.b	Create linear equations in one variable with infinitely many solutions
Supporting	8.SMC.EE.3.3-3.b	Create linear equations in one variable with no solutions
Supporting	8.SMC.EE.3.3-4.c	Solve linear equations with rational number coefficients
Supporting	8.SMC.EE.3.4-1.b	Show how solutions to a system of two linear equations in two variables correspond to points of intersection of their graph
Supporting	8.SMC.EE.3.4-2.b	Solve systems of two linear equations in two variables algebraically
Supporting	8.SMC.EE.3.4-3.b	Estimate solutions of two linear equations by graphing the equations
Supporting	8.SMC.EE.3.4-4.b	Solve simple cases of systems of two linear equations by inspection
Supporting	8.SMC.EE.3.4-5.c	Solve real world and mathematical problems leading to two linear equations in two variables
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Functions (F)</i></b>
	<b>8.SMC.F.1</b>	<b>Define, evaluate, and compare functions.</b>
Supporting	8.SMC.F.1.1-1.a	Recognize that a function is a rule that assigns to each input exactly one output

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Supporting	8.SMC.F.1.1-2.a	Relate the graph of a function to the set of ordered pairs consisting of an input and the corresponding output
Supporting	8.SMC.F.1.2.b	Compare properties of two functions each represented in a different way
Supporting	8.SMC.F.1.3-1.c	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line
Supporting	8.SMC.F.1.3-2.c	Construct examples of functions that are not linear
	<b>8.SMC.F.2</b>	<b>Use functions to model relationships between quantities.</b>
Supporting	8.SMC.F.2.1-1.b	Construct a function to model a linear relationship between two quantities
Supporting	8.SMC.F.2.1-2.b	Determine the rate of change and initial value of the function from a description of a relationship
Supporting	8.SMC.F.2.1-3.b	Determine the rate of change and initial value of the function from two (x, y) values
Supporting	8.SMC.F.2.1-4.b	Interpret the rate of change and initial value of a linear function in terms of the situation it models
Supporting	8.SMC.F.2.1-5.b	Interpret the rate of change and initial value of a linear function in terms of its graph
Supporting	8.SMC.F.2.1-6.b	Interpret the rate of change and initial value of a linear function in terms of a table of values
Supporting	8.SMC.F.2.2-1.c	Describe qualitatively the functional relationship between two quantities by analyzing a graph
Supporting	8.SMC.F.2.2-2.c	Graph the qualitative features of a function that has been described verbally
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Geometry (G)</i></b>
	<b>8.SMC.G.1</b>	<b>Understand congruence and similarity using physical models, transparencies, or geometry software.</b>
Supporting	8.SMC.G.1.1-1.b	Verify experimentally the properties of rotations, reflections, and translations, when lines are taken to lines
Supporting	8.SMC.G.1.1-2.b	Verify experimentally the properties of rotations, reflections, and translations, when line segments are taken to line segments of the same length
Supporting	8.SMC.G.1.1-3.b	Verify experimentally the properties of rotations, reflections, and translations, when angles are taken to angles of the same measure
Supporting	8.SMC.G.1.1-4.b	Verify experimentally the properties of rotations, reflections, and translations, when parallel lines are taken to parallel lines
Supporting	8.SMC.G.1.2-1.b	Show 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
Supporting	8.SMC.G.1.2-2.b	Describe a sequence that exhibits the congruence between two congruent figures
Supporting	8.SMC.G.1.3-1.b	Describe the effect of dilations on two-dimensional figures using coordinates
Supporting	8.SMC.G.1.3-2.b	Describe the effect of translations on two-dimensional figures using coordinates
Supporting	8.SMC.G.1.3-3.b	Describe the effect of rotations on two-dimensional figures using coordinates
Supporting	8.SMC.G.1.3-4.b	Describe the effect of reflections on two-dimensional figures using coordinates
Supporting	8.SMC.G.1.4-1.b	Relate one two-dimensional figure as similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations
Supporting	8.SMC.G.1.4-2.b	Describe a sequence that exhibits the similarity between two similar two-dimensional figures
Supporting	8.SMC.G.1.5-1.c	State informal arguments to establish facts about the angle sum of triangles
Supporting	8.SMC.G.1.5-2.c	State informal arguments to establish facts about the exterior angle of triangles
Supporting	8.SMC.G.1.5-3.c	State informal arguments to establish facts about the angles created when parallel lines are cut by a transversal
Supporting	8.SMC.G.1.5-4.c	State informal arguments to establish facts about the angle-angle criterion for similarity of triangles
	<b>8.SMC.G.2</b>	<b>Understand and apply the Pythagorean Theorem.</b>
Supporting	8.SMC.G.2.1-1.b	Explain a proof of the Pythagorean Theorem
Supporting	8.SMC.G.2.1-2.b	Explain a proof of the converse of the Pythagorean Theorem
Supporting	8.SMC.G.2.2-1.c	Solve real world and mathematical problems in two dimensions using the Pythagorean Theorem to determine unknown side lengths in right triangles
Supporting	8.SMC.G.2.2-2.c	Solve real world and mathematical problems in three dimensions using the Pythagorean Theorem to determine unknown side lengths in right triangles
Supporting	8.SMC.G.2.3.c	Find the distance between two points in a coordinate system using the Pythagorean Theorem
	<b>8.SMC.G.3</b>	<b>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</b>

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Supporting	8.SMC.G.3.1-1.b	Solve real world and mathematical problems using the formula for the volume of cones
Supporting	8.SMC.G.3.1-2.b	Solve real world and mathematical problems using the formula for the volume of cylinders
Supporting	8.SMC.G.3.1-3.b	Solve real world and mathematical problems using the formula for the volume of spheres
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Statistics and Probability (SP)</i></b>
	<b>8.SMC.SP.1</b>	<b>Investigate patterns of association in bivariate data.</b>
Supporting	8.SMC.SP.1.1-1.a	Construct scatter plots for bivariate measurement data
Supporting	8.SMC.SP.1.1-2.a	Analyze patterns of association between two quantities on a scatter plot of bivariate measurement data
Supporting	8.SMC.SP.1.2-1.b	Assess the proximity of data points to a line on a scatter plot in order to determine its linear association
Supporting	8.SMC.SP.1.2-2.b	Assess the model fit to a line on a scatter plot by judging the closeness of the data points to a line
Supporting	8.SMC.SP.1.3.b	Solve problems by interpreting the slope and intercept of bivariate measurement data by using the equation of a linear model
Supporting	8.SMC.SP.1.4-1.c	Analyze patterns of association of categorical data displayed in a two-way frequency and relative frequency table
Supporting	8.SMC.SP.1.4-2.c	Construct a two-way table summarizing data on two categorical variables collected from the same subjects
Supporting	8.SMC.SP.1.4-3.c	Analyze summary data from a two-way frequency table to describe the association between two categorical variables
<b>DOMAIN: Standards for Mathematical Practices</b>		
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Solve Problems (MP1)</i></b>
	<b>8.SMP.1</b>	<b>1. Make sense of problems and persevere in solving them.</b>
Supporting	8.SMP.1.c	Make sense of problems and persevere in solving them
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Reason (MP2)</i></b>
	<b>8.SMP.2</b>	<b>2. Reason abstractly and quantitatively.</b>
Supporting	8.SMP.2.c	Reason abstractly and quantitatively
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Construct Arguments (MP3)</i></b>
	<b>8.SMP.3</b>	<b>3. Construct viable arguments and critique the reasoning of others.</b>
Supporting	8.SMP.3.c	Construct viable arguments and critique the reasoning of others
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Model (MP4)</i></b>
	<b>8.SMP.4</b>	<b>4. Model with mathematics.</b>
Supporting	8.SMP.4.c	Model with mathematics
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Use Tools (MP5)</i></b>
	<b>8.SMP.5</b>	<b>5. Use appropriate tools strategically.</b>
Supporting	8.SMP.5.c	Use appropriate tools strategically
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Attend to Precision (MP6)</i></b>
	<b>8.SMP.6</b>	<b>6. Attend to precision.</b>
Supporting	8.SMP.6.c	Attend to precision
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Use Structure (MP7)</i></b>
	<b>8.SMP.7</b>	<b>7. Look for and make use of structure.</b>
Supporting	8.SMP.7.c	Look for and make use of structure
<b>Status:</b>	<b>OCS Code:</b>	<b>Strand: <i>Express Regularity (MP8)</i></b>
	<b>8.SMP.8</b>	<b>8. Look for and express regularity in repeated reasoning.</b>
Supporting	8.SMP.8.c	Look for and express regularity in repeated reasoning