BENCHMARK REPORT
MATHEMATICS GRADE 8

ARCHDIOCESE OF CHICAGO

8th Grade		
DOMAIN: Standards for Mathematical Content		
OCS Code:	**Strand:** *The Number System (NS)*	**Rating**
8.SMC.NS.1	**Know that there are numbers that are not rational, and approximate them by rational numbers.**	Priority
8.SMC.NS.1.1-1.a	Show that numbers that are not rational are irrational	
8.SMC.NS.1.1-2.a	Show that every number has a decimal expansion	
8.SMC.NS.1.1-3.a	Show that for rational numbers the decimal expansion repeats eventually	
8.SMC.NS.1.1-4.a	Convert a decimal expansion which repeats eventually into a rational number	
8.SMC.NS.1.2-1.b	Compare rational approximations of irrational numbers to the size of irrational numbers	
8.SMC.NS.1.2-2.b	Locate rational approximations of irrational numbers on a number line diagram	
8.SMC.NS.1.2-3.b	Estimate the value of expressions by using rational approximations of irrational numbers	
OCS Code:	**Strand:** *Expressions and Equations (EE)*	**Rating**
8.SMC.EE.1	**Work with radicals and integer exponents.**	Priority
8.SMC.EE.1.1-1.a	Show that the properties of integer exponents generate equivalent numerical expressions	
8.SMC.EE.1.1-2.a	Apply the properties of integer exponents to generate equivalent numerical expressions	
8.SMC.EE.1.2-1.b	Use square root symbols to represent solutions to equations of the form $x2 = p$, where p is a positive rational number	
8.SMC.EE.1.2-2.b	Use cube root symbols to represent solutions to equations of the form $x3 = p$, where p is a positive rational number	
8.SMC.EE.1.2-3.b	Evaluate square roots of small perfect squares	
8.SMC.EE.1.2-4.b	Evaluate cube roots of small perfect cubes	
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	
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	
8.SMC.EE.1.4-1.c	Perform operations with numbers expressed in scientific notation	
8.SMC.EE.1.4-2.c	Choose units of appropriate size for measurements of large or small quantities using scientific notation	
8.SMC.EE.1.4-3.c	Interpret numbers that have been expressed in scientific notation which have been generated by technology	
8.SMC.EE.2	**Understand the connections between proportional relationships, lines, and linear equations.**	Priority
8.SMC.EE.2.1-1.b	Graph proportional relationships	
8.SMC.EE.2.1-2.b	Interpret the unit rate as the slope of a graph showing a proportional relationship	
8.SMC.EE.2.1-3.b	Compare two different proportional relationships represented in different ways	
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	
8.SMC.EE.2.2-2.b	Derive the equation $y = mx$ for a line through the origin	
8.SMC.EE.2.2-3.b	Derive the equation $y = mx + b$ for a line intercepting the vertical axis at b	
8.SMC.EE.3	**Analyze and solve linear equations and pairs of simultaneous linear equations.**	Priority
8.SMC.EE.3.3-1.b	Create linear equations in one variable with one solution	
8.SMC.EE.3.3-2.b	Create linear equations in one variable with infinitely many solutions	
8.SMC.EE.3.3-3.b	Create linear equations in one variable with no solutions	
8.SMC.EE.3.3-4.c	Solve linear equations with rational number coefficients	
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	
8.SMC.EE.3.4-2.b	Solve systems of two linear equations in two variables algebraically	
8.SMC.EE.3.4-3.b	Estimate solutions of two linear equations by graphing the equations	
8.SMC.EE.3.4-4.b	Solve simple cases of systems of two linear equations by inspection	
8.SMC.EE.3.4-5.c	Solve real world and mathematical problems leading to two linear equations in two variables	

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OCS Code:	Strand: *Functions (F)*	Rating
8.SMC.F.1	**Define, evaluate, and compare functions.**	Priority
8.SMC.F.1.1-1.a	Recognize that a function is a rule that assigns to each input exactly one output	
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	
8.SMC.F.1.2.b	Compare properties of two functions each represented in a different way	
8.SMC.F.1.3-1.c	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line	
8.SMC.F.1.3-2.c	Construct examples of functions that are not linear	
8.SMC.F.2	**Use functions to model relationships between quantities.**	Priority
8.SMC.F.2.1-1.b	Construct a function to model a linear relationship between two quantities	
8.SMC.F.2.1-2.b	Determine the rate of change and initial value of the function from a description of a relationship	
8.SMC.F.2.1-3.b	Determine the rate of change and initial value of the function from two (x, y) values	
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	
8.SMC.F.2.1-5.b	Interpret the rate of change and initial value of a linear function in terms of its graph	
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	
8.SMC.F.2.2-1.c	Describe qualitatively the functional relationship between two quantities by analyzing a graph	
8.SMC.F.2.2-2.c	Graph the qualitative features of a function that has been described verbally	
OCS Code:	Strand: *Geometry (G)*	Rating
8.SMC.G.1	**Understand congruence and similarity using physical models, transparencies, or geometry software.**	Priority
8.SMC.G.1.1-1.b	Verify experimentally the properties of rotations, reflections, and translations, when lines are taken to lines	
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	
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	
8.SMC.G.1.1-4.b	Verify experimentally the properties of rotations, reflections, and translations, when parallel lines are taken to parallel lines	
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	
8.SMC.G.1.2-2.b	Describe a sequence that exhibits the congruence between two congruent figures	
8.SMC.G.1.3-1.b	Describe the effect of dilations on two-dimensional figures using coordinates	
8.SMC.G.1.3-2.b	Describe the effect of translations on two-dimensional figures using coordinates	
8.SMC.G.1.3-3.b	Describe the effect of rotations on two-dimensional figures using coordinates	
8.SMC.G.1.3-4.b	Describe the effect of reflections on two-dimensional figures using coordinates	
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	
8.SMC.G.1.4-2.b	Describe a sequence that exhibits the similarity between two similar two-dimensional figures	
8.SMC.G.1.5-1.c	State informal arguments to establish facts about the angle sum of triangles	
8.SMC.G.1.5-2.c	State informal arguments to establish facts about the exterior angle of triangles	
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	
8.SMC.G.1.5-4.c	State informal arguments to establish facts about the angle-angle criterion for similarity of triangles	
8.SMC.G.2	**Understand and apply the Pythagorean Theorem.**	Priority
8.SMC.G.2.1-1.b	Explain a proof of the Pythagorean Theorem	
8.SMC.G.2.1-2.b	Explain a proof of the converse of the Pythagorean Theorem	
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	

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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	
8.SMC.G.2.3.c	Find the distance between two points in a coordinate system using the Pythagorean Theorem	
8.SMC.G.3	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**	Priority
8.SMC.G.3.1-1.b	Solve real world and mathematical problems using the formula for the volume of cones	
8.SMC.G.3.1-2.b	Solve real world and mathematical problems using the formula for the volume of cylinders	
8.SMC.G.3.1-3.b	Solve real world and mathematical problems using the formula for the volume of spheres	
OCS Code:	**Strand: *Statistics and Probability (SP)***	**Rating**
8.SMC.SP.1	**Investigate patterns of association in bivariate data.**	Priority
8.SMC.SP.1.1-1.a	Construct scatter plots for bivariate measurement data	
8.SMC.SP.1.1-2.a	Analyze patterns of association between two quantities on a scatter plot of bivariate measurement data	
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	
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	
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	
8.SMC.SP.1.4-1.c	Analyze patterns of association of categorical data displayed in a two-way frequency and relative frequency table	
8.SMC.SP.1.4-2.c	Construct a two-way table summarizing data on two categorical variables collected from the same subjects	
8.SMC.SP.1.4-3.c	Analyze summary data from a two-way frequency table to describe the association between two categorical variables	
	DOMAIN: Standards for Mathematical Practices	
OCS Code:	**Strand: *Solve Problems (MP1)***	**Rating**
8.SMP.1	**1. Make sense of problems and persevere in solving them.**	Priority
8.SMP.1.c	Make sense of problems and persevere in solving them	
OCS Code:	**Strand: *Reason (MP2)***	**Rating**
8.SMP.2	**2. Reason abstractly and quantitatively.**	Priority
8.SMP.2.c	Reason abstractly and quantitatively	
OCS Code:	**Strand: *Construct Arguments (MP3)***	**Rating**
8.SMP.3	**3. Construct viable arguments and critique the reasoning of others.**	Priority
8.SMP.3.c	Construct viable arguments and critique the reasoning of others	
OCS Code:	**Strand: *Model (MP4)***	**Rating**
8.SMP.4	**4. Model with mathematics.**	Priority
8.SMP.4.c	Model with mathematics	
OCS Code:	**Strand: *Use Tools (MP5)***	**Rating**
8.SMP.5	**5. Use appropriate tools strategically.**	Supporting
8.SMP.5.c	Use appropriate tools strategically	
OCS Code:	**Strand: *Attend to Precision (MP6)***	**Rating**
8.SMP.6	**6. Attend to precision.**	Priority
8.SMP.6.c	Attend to precision	
OCS Code:	**Strand: *Use Structure (MP7)***	**Rating**
8.SMP.7	**7. Look for and make use of structure.**	Supporting
8.SMP.7.c	Look for and make use of structure	
OCS Code:	**Strand: *Express Regularity (MP8)***	**Rating**
8.SMP.8	**8. Look for and express regularity in repeated reasoning.**	Supporting
8.SMP.8.c	Look for and express regularity in repeated reasoning	

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