BENCHMARK COMPLEXITY REPORT
MATHEMATICS GRADE 8

ARCHDIOCESE OF CHICAGO

Key: **OCS Code** = The benchmark code. Consists of Grade (K-8), Domain (2-3 character alpha code), Strand (1-3 character alpha code), Standard (1-9), Benchmark Number (1 or 1-1 and up), and Complexity (a, b, c).
Benchmark = The wording of the benchmark.
CCSS Code = Common Core State Standards, developed by National Governors Association Center for Best Practices, Council of Chief State School Officers (www.corestandards.org).
CRS Strand = ACT College Readiness Standards developed by ACT, Inc. (www.act.org).
The CRS Strands are: BOA = Basic Operations & Applications, PSD = Probability/Statistics/Data, NCP = Numbers/Concepts/Properties, XEI = Expression/Equation & Inequality, GRE = Graphical Representations, PPF = Properties of Plane Fugures, MEA = Measurement, FUN = Functions.

a. Low Complexity				b. Intermediate Complexity				c. High Complexity			
OCS Code	**Benchmark**	**CCSS Code**	**CRS Strand**	**OCS Code**	**Benchmark**	**CCSS Code**	**CRS Strand**	**OCS Code**	**Benchmark**	**CCSS Code**	**CRS Strand**
DOMAIN: Standards for Mathematical Content											
The Number System											
8.SMC.NS.1.1-1.a	Show that numbers that are not rational are irrational	8.NS.A.1	NCP	8.SMC.NS.1.2-1.b	Compare rational approximations of irrational numbers to the size of irrational numbers	8.NS.A.2	NCP				
8.SMC.NS.1.1-2.a	Show that every number has a decimal expansion	8.NS.A.1	NCP	8.SMC.NS.1.2-2.b	Locate rational approximations of irrational numbers on a number line diagram	8.NS.A.2	GRE				
8.SMC.NS.1.1-3.a	Show that for rational numbers the decimal expansion repeats eventually	8.NS.A.1	NCP	8.SMC.NS.1.2-3.b	Estimate the value of expressions by using rational approximations of irrational numbers	8.NS.A.2	NCP				
8.SMC.NS.1.1-4.a	Convert a decimal expansion which repeats eventually into a rational number	8.NS.A.1	NCP								
Expressions and Equations											
8.SMC.EE.1.1-1.a	Show that the properties of integer exponents generate equivalent numerical expressions	8.EE.A.1	NCP	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.EE.A.2	XEI	8.SMC.EE.1.4-1.c	Perform operations with numbers expressed in scientific notation	8.EE.A.4	NCP
8.SMC.EE.1.1-2.a	Apply the properties of integer exponents to generate equivalent numerical expressions	8.EE.A.1	NCP	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.EE.A.2	XEI	8.SMC.EE.1.4-2.c	Choose units of appropriate size for measurements of large or small quantities using scientific notation	8.EE.A.4	NCP
				8.SMC.EE.1.2-3.b	Evaluate square roots of small perfect squares	8.EE.A.2	NCP	8.SMC.EE.1.4-3.c	Interpret numbers that have been expressed in scientific notation which have been generated by technology	8.EE.A.4	NCP
				8.SMC.EE.1.2-4.b	Evaluate cube roots of small perfect cubes	8.EE.A.2	NCP	8.SMC.EE.3.3-4.c	Solve linear equations with rational number coefficients	8.EE.C.7b	XEI
				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.EE.A.3	NCP	8.SMC.EE.3.4-5.c	Solve real world and mathematical problems leading to two linear equations in two variables	8.EE.C.8c	XEI
				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.EE.A.3	NCP				
				8.SMC.EE.2.1-1.b	Graph proportional relationships	8.EE.B.5	GRE				
				8.SMC.EE.2.1-2.b	Interpret the unit rate as the slope of a graph showing a proportional relationship	8.EE.B.5	GRE				
				8.SMC.EE.2.1-3.b	Compare two different proportional relationships represented in different ways	8.EE.B.5	GRE				
				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.EE.B.6	GRE				
				8.SMC.EE.2.2-2.b	Derive the equation y = mx for a line through the origin	8.EE.B.6	GRE				
				8.SMC.EE.2.2-3.b	Derive the equation y = mx + b for a line intercepting the vertical axis at b	8.EE.B.6	GRE				
				8.SMC.EE.3.3-1.b	Create linear equations in one variable with one solution	8.EE.C.7a	XEI				
				8.SMC.EE.3.3-2.b	Create linear equations in one variable with infinitely many solutions	8.EE.C.7a	XEI				
				8.SMC.EE.3.3-3.b	Create linear equations in one variable with no solutions	8.EE.C.7a	XEI				
				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.EE.C.8a	GRE				

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				8.SMC.EE.3.4-2.b	Solve systems of two linear equations in two variables algebraically	8.EE.C.8b	XEI				
				8.SMC.EE.3.4-3.b	Estimate solutions of two linear equations by graphing the equations	8.EE.C.8b	GRE				
				8.SMC.EE.3.4-4.b	Solve simple cases of systems of two linear equations by inspection	8.EE.C.8b	XEI				
Functions											
8.SMC.F.1.1-1.a	Recognize that a function is a rule that assigns to each input exactly one output	8.F.A.1	FUN	8.SMC.F.1.2.b	Compare properties of two functions each represented in a different way	8.F.A.2	FUN	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.F.A.3	GRE
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.F.A.1	GRE	8.SMC.F.2.1-1.b	Construct a function to model a linear relationship between two quantities	8.F.B.4	GRE	8.SMC.F.1.3-2.c	Construct examples of functions that are not linear	8.F.A.3	GRE
				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.F.B.4	GRE	8.SMC.F.2.2-1.c	Describe qualitatively the functional relationship between two quantities by analyzing a graph	8.F.B.5	GRE
				8.SMC.F.2.1-3.b	Determine the rate of change and initial value of the function from two (x, y) values	8.F.B.4	GRE	8.SMC.F.2.2-2.c	Graph the qualitative features of a function that has been described verbally	8.F.B.5	GRE
				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.F.B.4	GRE				
				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.F.B.4	GRE				
				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.F.B.4	GRE				
Geometry											
				8.SMC.G.1.1-1.b	Verify experimentally the properties of rotations, reflections, and translations, when lines are taken to lines	8.G.A.1a	PPF	8.SMC.G.1.5-1.c	State informal arguments to establish facts about the angle sum of triangles	8.G.A.5	PPF
				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.G.A.1a	PPF	8.SMC.G.1.5-2.c	State informal arguments to establish facts about the exterior angle of triangles	8.G.A.5	PPF
				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.G.A.1b	PPF	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.G.A.5	PPF
				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.G.A.1c	PPF	8.SMC.G.1.5-4.c	State informal arguments to establish facts about the angle-angle criterion for similarity of triangles	8.G.A.5	PPF
				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.G.A.2	MEA	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	8.G.B.7	PPF
				8.SMC.G.1.2-2.b	Describe a sequence that exhibits the congruence between two congruent figures	8.G.A.2	MEA	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.G.B.7	PPF
				8.SMC.G.1.3-1.b	Describe the effect of dilations on two-dimensional figures using coordinates	8.G.A.3	GRE	8.SMC.G.2.3.c	Find the distance between two points in a coordinate system using the Pythagorean Theorem	8.G.B.8	PPF
				8.SMC.G.1.3-2.b	Describe the effect of translations on two-dimensional figures using coordinates	8.G.A.3	GRE				
				8.SMC.G.1.3-3.b	Describe the effect of rotations on two-dimensional figures using coordinates	8.G.A.3	GRE				
				8.SMC.G.1.3-4.b	Describe the effect of reflections on two-dimensional figures using coordinates	8.G.A.3	GRE				

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				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.G.A.4	MEA				
				8.SMC.G.1.4-2.b	Describe a sequence that exhibits the similarity between two similar two-dimensional figures	8.G.A.4	MEA				
				8.SMC.G.2.1-1.b	Explain a proof of the Pythagorean Theorem	8.G.B.6	PPF				
				8.SMC.G.2.1-2.b	Explain a proof of the converse of the Pythagorean Theorem	8.G.B.6	PPF				
				8.SMC.G.3.1-1.b	Solve real world and mathematical problems using the formula for the volume of cones	8.G.C.9	MEA				
				8.SMC.G.3.1-2.b	Solve real world and mathematical problems using the formula for the volume of cylinders	8.G.C.9	MEA				
				8.SMC.G.3.1-3.b	Solve real world and mathematical problems using the formula for the volume of spheres	8.G.C.9	MEA				
Statistics and Probability											
8.SMC.SP.1.1-1.a	Construct scatter plots for bivariate measurement data	8.SP.A.1	PSD	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.SP.A.2	PSD	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.SP.A.4	PSD
8.SMC.SP.1.1-2.a	Analyze patterns of association between two quantities on a scatter plot of bivariate measurement data	8.SP.A.1	PSD	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.SP.A.2	PSD	8.SMC.SP.1.4-2.c	Construct a two-way table summarizing data on two categorical variables collected from the same subjects	8.SP.A.4	PSD
				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.SP.A.3	PSD	8.SMC.SP.1.4-3.c	Analyze summary data from a two-way frequency table to describe the association between two categorical variables	8.SP.A.4	PSD
DOMAIN: Standards for Mathematical Practices											
Solve Problems											
								8.SMP.1.c	Make sense of problems and persevere in solving them	MP1	
Reason											
								8.SMP.2.c	Reason abstractly and quantitatively	MP2	
Construct Arguments											
								8.SMP.3.c	Construct viable arguments and critique the reasoning of others	MP3	
Model											
								8.SMP.4.c	Model with mathematics	MP4	
Use Tools											
								8.SMP.5.c	Use appropriate tools strategically	MP5	
Attend to Precision											
								8.SMP.6.c	Attend to precision	MP6	
Use Structure											
								8.SMP.7.c	Look for and make use of structure	MP7	
Express Regularity											
								8.SMP.8.c	Look for and express regularity in repeated reasoning	MP8	