BENCHMARKS WITH EXAMPLES REPORT
MATHEMATICS GRADE 6

ARCHDIOCESE OF CHICAGO

Key:

Status = Benchmarks designated as "Focus" are aligned to the Terra Nova, third edition. Benchmarks designated "Supporting" are not.

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).

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 Figures, MEA = Measurement, FUN = Functions.

DOMAIN: Standards for Mathematical Content				
OCS Code:	**Strand: *Ratios and Proportional Relationships (RP)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMC.RP.1	**Understand ratio concepts and use ratio reasoning to solve problems.**			
6.SMC.RP.1.1.a	Use ratio language to describe a ratio relationship between two quantities	e.g., “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”	6.RP.A.1	BOA
6.SMC.RP.1.2-1.a	Compare a unit rate a/b with a ratio a:b with b ≠ 0	e.g., “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	6.RP.A.2	BOA
6.SMC.RP.1.2-2.a	Use rate language in the context of a ratio relationship	e.g., “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar.” “We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	6.RP.A.2	BOA
6.SMC.RP.1.3-1.b	Make tables of equivalent ratios relating quantities with whole number measurements		6.RP.A.3a	BOA
6.SMC.RP.1.3-2.b	Find missing values in a table of equivalent ratios relating quantities with whole number measurements		6.RP.A.3a	BOA
6.SMC.RP.1.3-3.b	Plot pairs of values of equivalent ratios on the coordinate plane		6.RP.A.3a	GRE
6.SMC.RP.1.3-4.b	Compare equivalent ratios using tables		6.RP.A.3a	BOA
6.SMC.RP.1.3-5.c	Solve unit rate problems including those involving unit pricing and constant speed	e.g., If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	6.RP.A.3b	BOA
6.SMC.RP.1.3-6.b	Find a percent of a quantity as a rate per 100	e.g., 30% of a quantity means 30/100 times the quantity	6.RP.A.3c	BOA
6.SMC.RP.1.3-7.b	Solve problems by finding the whole, given a part and the percent		6.RP.A.3c	BOA
6.SMC.RP.1.3-8.b	Convert measurement units using ratio reasoning		6.RP.A.3d	BOA
6.SMC.RP.1.3-9.b	Manipulate measurement units when multiplying or dividing quantities		6.RP.A.3d	BOA
6.SMC.RP.1.3-10.b	Transform measurement units when multiplying or dividing quantities		6.RP.A.3d	BOA
OCS Code:	**Strand: *The Number System (NS)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMC.NS.1	**Apply and extend previous understandings of multiplication and division to divide fractions by fractions.**			
6.SMC.NS.1.1-1.b	Interpret quotients of fractions	e.g., By using visual fraction models and equations to represent the problem	6.NS.A.1	BOA
6.SMC.NS.1.1-2.b	Compute quotients of fractions	e.g., By using visual fraction models and equations to represent the problem	6.NS.A.1	BOA
6.SMC.NS.1.1-3.b	Solve word problems involving division of fractions by fractions	e.g., By using visual fraction models and equations to represent the problem. Create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	6.NS.A.1	BOA

6.SMC.NS.2	**Compute fluently with multi-digit numbers and find common factors and multiples.**			
6.SMC.NS.2.2.a	Divide multi-digit numbers fluently using the standard algorithm		6.NS.B.2	BOA
6.SMC.NS.2.3.a	Add, subtract, multiply, and divide multi-digit decimals fluently using the standard algorithm for each operation		6.NS.B.3	BOA
6.SMC.NS.2.4-1.b	Find the greatest common factor of two whole numbers less than or equal to 100		6.NS.B.4	NCP
6.SMC.NS.2.4-2.b	Find the least common multiple of two whole numbers less than or equal to 12		6.NS.B.4	NCP
6.SMC.NS.2.4-3.b	Use the distributive property to express a sum of two whole numbers from 1 to 100 with a common factor as a multiple of a sum of two whole numbers with no common factor	e.g., Express 36 + 8 as 4 (9 + 2)	6.NS.B.4	NCP
6.SMC.NS.3	**Apply and extend previous understandings of numbers to the system of rational numbers.**			
6.SMC.NS.3.1-1.b	Show that positive and negative numbers are used together to describe quantities having opposite directions or values	e.g., Temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge	6.NS.C.5	NCP
6.SMC.NS.3.1-2.b	Explain the meaning of zero when using positive and negative numbers to represent quantities in real-world contexts		6.NS.C.5	NCP
6.SMC.NS.3.2-1.a	Express opposite signs of numbers as indicating locations on opposite sides of 0 on the number line		6.NS.C.6a	GRE
6.SMC.NS.3.2-2.a	Show that the opposite of the opposite of a number is the number itself	e.g., –(–3) = 3	6.NS.C.6a	NCP
6.SMC.NS.3.2-3.a	Show that 0 is its own opposite		6.NS.C.6a	NCP
6.SMC.NS.3.2-4.b	Show that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane		6.NS.C.6b	GRE
6.SMC.NS.3.2-5.b	Show that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes in quadrants of the coordinate plane		6.NS.C.6b	GRE
6.SMC.NS.3.2-6.a	Find integers and other rational numbers on a horizontal or vertical number line diagram		6.NS.C.6c	GRE
6.SMC.NS.3.2-7.b	Position integers and other rational numbers on a horizontal or vertical number line diagram		6.NS.C.6c	GRE
6.SMC.NS.3.2-8.a	Find pairs of integers and other rational numbers on a coordinate plane		6.NS.C.6c	GRE
6.SMC.NS.3.2-9.b	Position pairs of integers and other rational numbers on a coordinate plane		6.NS.C.6c	GRE
6.SMC.NS.3.3-1.b	Use the relative position of two numbers on a number line diagram to interpret statements of inequality	e.g., Interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right	6.NS.C.7a	GRE
6.SMC.NS.3.3-2.b	Write statements of order for rational numbers using real-world context	e.g., Write –3˚C > –7˚C to express the fact that –3˚C is warmer than –7˚C	6.NS.C.7b	NCP
6.SMC.NS.3.3-3.b	Interpret statements of order for rational numbers using real-world contexts	e.g., Write –3˚C > –7˚C to express the fact that –3˚C is warmer than –7˚C	6.NS.C.7b	NCP
6.SMC.NS.3.3-4.b	Explain statements of order for rational numbers using real-world contexts	e.g., Write –3˚C > –7˚C to express the fact that –3˚C is warmer than –7˚C	6.NS.C.7b	NCP
6.SMC.NS.3.3-5.c	Use the distance from 0 on the number line to identify the absolute value of a rational number		6.NS.C.7c	GRE
6.SMC.NS.3.3-6.c	Use the distance from 0 on the number line to interpret the absolute value as magnitude for a positive or negative quantity in a real-world situation	e.g., For an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars	6.NS.C.7c	GRE

6.SMC.NS.3.3-7.c	Distinguish comparisons of absolute value from statements about order	e.g., Recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars	6.NS.C.7d	NCP
6.SMC.NS.3.4.c	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane	Note: Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	6.NS.C.8	GRE
OCS Code:	**Strand: *Expressions and Equations (EE)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMC.EE.1	**Apply and extend previous understandings of arithmetic to algebraic expressions.**			
6.SMC.EE.1.1-1.a	Write numerical expressions involving whole-number exponents		6.EE.A.1	NCP
6.SMC.EE.1.1-2.a	Evaluate numerical expressions involving whole-number exponents		6.EE.A.1	NCP
6.SMC.EE.1.2-1.a	Write expressions that record operations with numbers and with letters standing for numbers	e.g., Express the calculation “Subtract y from 5” as 5 – y	6.EE.A.2a	XEI
6.SMC.EE.1.2-2.b	Identify parts of an expression using mathematical terminology	e.g., Sum, term, product, factor, quotient, and coefficient	6.EE.A.2b	XEI
6.SMC.EE.1.2-3.b	Describe one or more parts of an expression as a single entity	e.g., Describe the expression 2 (8 + 7) as a product of two factors. View (8 + 7) as both a single entity and a sum of two terms	6.EE.A.2b	XEI
6.SMC.EE.1.2-4.b	Evaluate expressions at specific values of their variables	Note: Include expressions that arise from formulas used in real-world problems.	6.EE.A.2c	XEI
6.SMC.EE.1.2-5.b	Use Order of Operations to perform arithmetic operations in the conventional order when there are no parentheses to specify a particular order	e.g., Include whole number exponents. Use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2	6.EE.A.2c	BOA
6.SMC.EE.1.3.c	Apply the properties of operations to generate equivalent expressions	e.g., Apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y. Reason about and solve one-variable equations and inequalities	6.EE.A.3	XEI
6.SMC.EE.1.4.b	Determine the equivalency of two expressions	Note: The two expressions are equivalent when they name a number regardless of which value is substituted into them. e.g., The expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.	6.EE.A.4	XEI
6.SMC.EE.2	**Reason about and solve one-variable equations and inequalities.**			
6.SMC.EE.2.1-1.b	Determine the set of values that make an equation or inequality true	e.g., View solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true?	6.EE.B.5	XEI
6.SMC.EE.2.1-2.b	Use substitution to determine whether a given number in a specified set makes an equation or inequality true		6.EE.B.5	XEI
6.SMC.EE.2.2-1.b	Solve a real world or mathematical problem by writing expressions with variables representing numbers		6.EE.B.6	XEI
6.SMC.EE.2.2-2.b	Show that a variable represents an unknown number or any number in a specified set		6.EE.B.6	XEI
6.SMC.EE.2.3-1.c	Solve real-world and mathematical problems by using equations of the form x + p = q for cases in which p, q and x are all nonnegative rational numbers		6.EE.B.7	XEI
6.SMC.EE.2.3-2.c	Solve real-world and mathematical problems by using equations of the form px = q for cases in which p, x and q are all nonnegative rational numbers		6.EE.B.7	XEI
6.SMC.EE.2.4-1.c	Write an inequality of the form x > c or x < c to represent a real world or mathematical constraint or condition		6.EE.B.8	XEI

6.SMC.EE.2.4-2.b	Show that inequalities of the form x > c or x < c have infinitely many solutions		6.EE.B.8	XEI
6.SMC.EE.2.4-3.b	Represent solutions of inequalities of the form x > c or x < c on number line diagrams		6.EE.B.8	XEI
6.SMC.EE.3	**Represent and analyze quantitative relationships between dependent and independent variables.**			
6.SMC.EE.3.1-1.c	Solve a real world problem that uses variables to represent two quantities that change in relationship to one another	e.g., In a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time	6.EE.C.9	PSD
6.SMC.EE.3.1-2.c	Write an equation that expresses one quantity as the independent variable and the second quantity as the dependent variable	e.g., In a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time	6.EE.C.9	PSD
6.SMC.EE.3.1-3.c	Analyze the relationship between the dependent and independent variables using graphs and tables	e.g., In a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time	6.EE.C.9	PSD
6.SMC.EE.3.1-4.c	Relate graphs and tables to a written equation that expresses one quantity as the independent variable and the second quantity as the dependent variable	e.g., In a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time	6.EE.C.9	PSD
OCS Code:	**Strand: *Geometry (G)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMC.G.1	**Solve real-world and mathematical problems involving area, surface area, and volume.**			
6.SMC.G.1.1-1.a	Find the area of right triangles, non-right triangles, special quadrilaterals, and polygons by composing into rectangles		6.G.A.1	MEA
6.SMC.G.1.1-2.a	Find the area of right triangles, non-right triangles, special quadrilaterals, and polygons by decomposing into triangles and other shapes		6.G.A.1	MEA
6.SMC.G.1.1-3.a	Solve real world problems by finding the area of right triangles, non-right triangles, special quadrilaterals, and polygons by composing into rectangles		6.G.A.1	MEA
6.SMC.G.1.1-4.a	Solve real world problems by finding the area of right triangles, non-right triangles, special quadrilaterals, and polygons by decomposing into triangles and other shapes		6.G.A.1	MEA
6.SMC.G.1.2-1.a	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths		6.G.A.2	MEA
6.SMC.G.1.2-2.a	Compare the volume of a right rectangular prism with fractional edge lengths found by packing it with unit cubes of unit fraction edge lengths to the volume of a right rectangular prism found by multiplying edge lengths of the prism	Note: These two volumes are equivalent.	6.G.A.2	MEA
6.SMC.G.1.2-3.a	Solve real world and mathematical problems by applying the formula V = l w h to find volumes of right rectangular prisms with fractional edge lengths		6.G.A.2	MEA
6.SMC.G.1.2-4.a	Solve real world and mathematical problems by applying the formula V = b h to find volumes of right rectangular prisms with fractional edge lengths		6.G.A.2	MEA
6.SMC.G.1.3-1.b	Draw polygons in the coordinate plane given coordinates for the vertices		6.G.A.3	GRE
6.SMC.G.1.3-2.b	Use coordinates in the coordinate plane to find the length of a side joining points with the same first or the same second coordinate		6.G.A.3	GRE

G.SMC.G.1.3-3.b	Solve real world problems by drawing polygons in the coordinate plane and finding the length of a side joining points with the same first or the same second coordinate		6.G.A.3	GRE
6.SMC.G.1.4-1.c	Represent three-dimensional figures using nets made up of rectangles and triangles		6.G.A.4	MEA
6.SMC.G.1.4-2.c	Use nets made up of rectangles and triangles representing three-dimensional figures to find the surface area of these figures		6.G.A.4	MEA
6.SMC.G.1.4-3.c	Solve real world and mathematical problems by representing three-dimensional figures by using nets made up of rectangles and triangles		6.G.A.4	MEA
OCS Code:	**Strand: *Statistics and Probability (SP)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMC.SP.1	**Develop understanding of statistical variability.**			
6.SMC.SP.1.1.a	Identify a statistical question	Note: A statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers. e.g., "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	6.SP.A.1	PSD
6.SMC.SP.1.2.b	Identify the characteristics of a statistical distribution of a set of data	Note: A statistical distribution can be described by its center, spread, and overall shape.	6.SP.A.2	PSD
6.SMC.SP.1.3-1.b	Locate a measure of center for a numerical data set	Note: A measure of center summarizes all of its values with a single number.	6.SP.A.3	PSD
6.SMC.SP.1.3-2.b	Locate a measure of variation for a numerical data set	Note: The measure of variation describes how its values vary.	6.SP.A.3	PSD
6.SMC.SP.2	**Summarize and describe distributions.**			
6.SMC.SP.2.1.a	Display numerical data in plots on a number line	e.g., Including dot plots, histograms, and box plots	6.SP.B.4	PSD
6.SMC.SP.2.2-1.b	Summarize numerical data sets in relation to their context by reporting the number of observations		6.SP.B.5a	PSD
6.SMC.SP.2.2-2.b	Summarize numerical data sets in relation to their context by describing how it was measured and its units of measurement		6.SP.B.5b	PSD
6.SMC.SP.2.2-3.c	Summarize numerical data sets in relation to their context by using quantitative measures of center	e.g., Median and/or mean	6.SP.B.5c	PSD
6.SMC.SP.2.2-4.c	Summarize numerical data sets in relation to their context by using quantitative measures of variability	e.g., Interquartile range and/or mean absolute deviation	6.SP.B.5c	PSD
6.SMC.SP.2.2-5.c	Summarize numerical data sets by describing overall patterns and deviations from the overall patterns with reference to the context in which the data were gathered		6.SP.B.5c	PSD
6.SMC.SP.2.2-6.c	Summarize numerical data sets by relating measures of center and variability to the shape of the data distribution in the context in which the data were gathered		6.SP.B.5d	PSD
DOMAIN: Standards for Mathematical Practices				
OCS Code:	**Strand: *Solve Problems (MP1)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.1	**1. Make sense of problems and persevere in solving them.**			
6.SMP.1.c	Make sense of problems and persevere in solving them		MP1	
OCS Code:	**Strand: *Reason (MP2)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.2	**2. Reason abstractly and quantitatively.**			
6.SMP.2.c	Reason abstractly and quantitatively		MP2	
OCS Code:	**Strand: *Construct Arguments (MP3)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**

6.SMP.3	**3. Construct viable arguments and critique the reasoning of others.**			
6.SMP.3.c	Construct viable arguments and critique the reasoning of others		MP3	
OCS Code:	**Strand: *Model (MP4)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.4	**4. Model with mathematics.**			
6.SMP.4.c	Model with mathematics		MP4	
OCS Code:	**Strand: *Use Tools (MP5)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.5	**5. Use appropriate tools strategically.**			
6.SMP.5.c	Use appropriate tools strategically		MP5	
OCS Code:	**Strand: *Attend to Precision (MP6)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.6	**6. Attend to precision.**			
6.SMP.6.c	Attend to precision		MP6	
OCS Code:	**Strand: *Use Structure (MP7)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.7	**7. Look for and make use of structure.**			
6.SMP.7.c	Look for and make use of structure		MP7	
OCS Code:	**Strand: *Express Regularity (MP8)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
6.SMP.8	**8. Look for and express regularity in repeated reasoning.**			
6.SMP.8.c	Look for and express regularity in repeated reasoning		MP8	