BENCHMARKS WITH EXAMPLES REPORT
MATHEMATICS GRADE 5

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: *Operations and Algebraic Thinking (OA)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMC.OA.1	**Write and interpret numerical expressions.**			
5.SMC.OA.1.1-1.a	Use parentheses, brackets, or braces in numerical expressions		5.OA.A.1	BOA
5.SMC.OA.1.1-2.a	Evaluate numerical expressions that use parentheses, brackets, or braces		5.OA.A.1	BOA
5.SMC.OA.1.2-1.b	Write simple expressions that record calculations with numbers	e.g., Express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7)	5.OA.A.2	BOA
5.SMC.OA.1.2-2.b	Interpret simple numerical expressions that record calculations with numbers without evaluating them	e.g., Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product	5.OA.A.2	BOA
5.SMC.OA.2	**Analyze patterns and relationships.**			
5.SMC.OA.2.1-1.c	Generate two numerical patterns using two given rules	e.g., Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences	5.OA.B.3	NCP
5.SMC.OA.2.1-2.c	Identify relationships that are evident between corresponding terms in two numerical patterns using two given rules	Note: Explain informally why terms in one sequence are twice the corresponding terms in the other sequence. e.g., Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence.	5.OA.B.3	NCP
5.SMC.OA.2.1-3.c	Form ordered pairs consisting of corresponding terms in two numerical patterns using two given rules	Note: Explain informally why terms in one sequence are twice the corresponding terms in the other sequence. e.g., Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence.	5.OA.B.3	GRE
5.SMC.OA.2.1-4.c	Graph on a coordinate plane the ordered pairs consisting of corresponding terms in two numerical patterns using two given rules	Note: Explain informally why terms in one sequence are twice the corresponding terms in the other sequence. e.g., Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence.	5.OA.B.3	GRE
OCS Code:	**Strand: *Number and Operations in Base Ten (NBT)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMC.NBT.1	**Understand the place value system.**			
5.SMC.NBT.1.1-1.a	Show that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right		5.NBT.A.1	NCP
5.SMC.NBT.1.1-2.a	Show that in a multi-digit number, a digit in one place represents 1/10 of what it represents in the place to its left		5.NBT.A.1	NCP
5.SMC.NBT.1.2-1.b	Determine patterns in the number of zeros of the product when multiplying a number by powers of 10		5.NBT.A.2	NCP
5.SMC.NBT.1.2-2.b	Determine patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10		5.NBT.A.2	NCP
5.SMC.NBT.1.2-3.b	Use whole-number exponents to denote powers of 10		5.NBT.A.2	NCP

5.SMC.NBT.1.3-1.a	Read decimals to thousandths using base-ten numerals, number names, and expanded form	e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000)	5.NBT.A.3a	NCP
5.SMC.NBT.1.3-2.a	Write decimals to thousandths using base-ten numerals, number names, and expanded form	e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000)	5.NBT.A.3a	NCP
5.SMC.NBT.1.3-3.b	Record the results of comparisons between two decimals to thousandths based on meanings of the digits in each place using the symbols >, =, and <		5.NBT.A.3b	NCP
5.SMC.NBT.1.4.a	Round decimals to any place	e.g., Use understanding of place value	5.NBT.A.4	NCP
5.SMC.NBT.2	**Perform operations with multi-digit whole numbers and with decimals to hundredths.**			
5.SMC.NBT.2.1.a	Multiply multi-digit whole numbers fluently using the standard algorithm		5.NBT.B.5	BOA
5.SMC.NBT.2.2-1.b	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors	Note: Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.	5.NBT.B.6	BOA
5.SMC.NBT.2.2-2.b	Show the calculation of whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors	e.g., By using equations, rectangular arrays, and/or area models	5.NBT.B.6	BOA
5.SMC.NBT.2.3-1.c	Add, subtract, multiply, and divide decimals to hundredths	Note: Use concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	5.NBT.B.7	BOA
5.SMC.NBT.2.3-2.c	Relate the strategy for decimal computation to a written method	e.g., Use strategies based on place value, properties of operations, and/or the relationship between addition and subtraction	5.NBT.B.7	BOA
5.SMC.NBT.2.3-3.c	Explain the reasoning for using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction for decimal computation		5.NBT.B.7	BOA
OCS Code:	**Strand: *Number and Operations - Fractions (NF)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMC.NF.1	**Use equivalent fractions as a strategy to add and subtract fractions.**			
5.SMC.NF.1.1.b	Add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions in order to produce an equivalent sum and difference of fractions with like denominators	Note: Include mixed numbers. e.g., 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)	5.NF.A.1	BOA
5.SMC.NF.1.2-1.c	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators	Note: By using visual fraction models or equations to represent the problem. e.g., Recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	5.NF.A.2	BOA
5.SMC.NF.1.2-2.c	Assess the reasonableness of solutions to word problems arrived at by mentally adding and subtracting fractions referring to the same whole	Note: Use benchmark fractions and number sense of fractions to estimate mentally.	5.NF.A.2	BOA
5.SMC.NF.2	**Apply and extend previous understandings of multiplication and division to multiply and divide fractions.**			
5.SMC.NF.2.1-1.c	Interpret a fraction as division of the numerator by the denominator	e.g., (a/b = a ÷ b). Interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4	5.NF.B.3	NCP
5.SMC.NF.2.1-2.c	Solve word problems involving division of whole numbers expressing answers in the form of fractions or mixed numbers	e.g., By using visual fraction models or equations to represent the problem. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?	5.NF.B.3	BOA
5.SMC.NF.2.2-1.b	Interpret the product (a/b) × q as "a" parts of a partition of q into b equal parts	e.g., Use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)	5.NF.B.4a	NCP

5.SMC.NF.2.2-2.b	Interpret the product (a/b) × q as the result of a sequence of operations a × q ÷ b	e.g., Use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)	5.NF.B.4a	NCP
5.SMC.NF.2.2-3.a	Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths		5.NF.B.4b	MEA
5.SMC.NF.2.2-4.a	Compare the area of a rectangle found by tiling it with unit squares of the appropriate unit fraction side lengths to the area of a rectangle found by multiplying the side lengths		5.NF.B.4b	MEA
5.SMC.NF.2.2-5.b	Find the area of a rectangle by multiplying fractional side lengths		5.NF.B.4b	MEA
5.SMC.NF.2.2-6.b	Represent fraction products as rectangular areas		5.NF.B.4b	MEA
5.SMC.NF.2.3-1.a	Use scaling or resizing to compare the size of a product to the size of one factor on the basis of the size of the other factor	Note: Interpret multiplication as scaling or resizing.	5.NF.B.5a	MEA
5.SMC.NF.2.3-2.b	Use scaling or resizing to explain why multiplying a given number by a fraction greater than one results in a product greater than the given number	Note: Interpret multiplication as scaling or resizing. Recognize multiplication by whole numbers greater than 1 as a familiar case.	5.NF.B.5b	MEA
5.SMC.NF.2.3-3.b	Use scaling or resizing to explain why multiplying a given number by a fraction less than one results in a product smaller than the given number	Note: Interpret multiplication as scaling or resizing.	5.NF.B.5b	MEA
5.SMC.NF.2.3-4.b	Use scaling or resizing to relate the principle of fraction equivalence to the effect of multiplication	e.g., a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1	5.NF.B.5b	MEA
5.SMC.NF.2.4.c	Solve real world problems involving multiplication of fractions and mixed numbers	e.g., By using visual fraction models or equations to represent the problem	5.NF.B.6	BOA
5.SMC.NF.2.5-1.b	Compute quotients by dividing unit fractions by non-zero whole numbers	Note: Interpret division of a unit fraction by a non-zero whole number. Create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.	5.NF.B.7a	BOA
5.SMC.NF.2.5-2.b	Compute quotients by dividing whole numbers by unit fractions	Note: Interpret division of a whole number by a unit fraction. Create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.	5.NF.B.7b	BOA
5.SMC.NF.2.5-3.c	Solve real world problems involving division of unit fractions by non-zero whole numbers	e.g., By using visual fraction models and equations to represent the problem. How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally?	5.NF.B.7c	BOA
5.SMC.NF.2.5-4.c	Solve real world problems involving division of whole numbers by unit fractions	e.g., By using visual fraction models and equations to represent the problem. How many 1/3-cup servings are in 2 cups of raisins?	5.NF.B.7c	BOA
OCS Code:	**Strand: *Measurement and Data (MD)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMC.MD.1	**Convert like measurement units within a given measurement system.**			
5.SMC.MD.1.1-1.a	Convert different-sized standard measurement units within a given measurement system	e.g., Convert 5 cm to 0.05 m	5.MD.A.1	BOA
5.SMC.MD.1.1-2.a	Solve multi-step, real world problems by converting different-sized standard measurement units within a given measurement system	e.g., Convert 5 cm to 0.05 m	5.MD.A.1	BOA
5.SMC.MD.2	**Represent and interpret data.**			
5.SMC.MD.2.1-1.b	Make a line plot to display a data set of measurements in fractions of a unit	e.g., 1/2, 1/4, 1/8	5.MD.B.2	PSD
5.SMC.MD.2.1-2.b	Solve problems involving information presented in line plots by using operations on fractions	e.g., Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally	5.MD.B.2	PSD

5.SMC.MD.3	**Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.**			
5.SMC.MD.3.1-1.a	Show that volume can be measured by one cubic unit with a side length 1 unit, called a "unit cube"		5.MD.C.3a	MEA
5.SMC.MD.3.1-2.b	Show that volume of n cubic units is made up of n unit cubes without gaps or overlaps		5.MD.C.3b	MEA
5.SMC.MD.3.2.b	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units		5.MD.C.4	MEA
5.SMC.MD.3.3-1.b	Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes		5.MD.C.5a	MEA
5.SMC.MD.3.3-2.b	Compare the volume of a right rectangular prism with whole-number side lengths, found by packing it with unit cubes, to the volume found by multiplying the edge lengths, to the volume found by multiplying the height by the area of the base		5.MD.C.5a	MEA
5.SMC.MD.3.3-3.b	Represent threefold whole-number products as volumes	e.g., To represent the associative property of multiplication	5.MD.C.5a	MEA
5.SMC.MD.3.3-4.c	Solve real world and mathematical problems by finding the volume of right rectangular prisms with whole number edge lengths using the formula V = l x w x h		5.MD.C.5b	MEA
5.SMC.MD.3.3-5.c	Solve real world and mathematical problems by finding the volume of right rectangular prisms with whole number edge lengths using the formula V = b x h		5.MD.C.5b	MEA
5.SMC.MD.3.3-6.c	Demonstrate that volume is additive by finding volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts		5.MD.C.5c	MEA
5.SMC.MD.3.3-7.c	Solve real world problems by adding the volumes of non-overlapping parts to find the volume of a solid figure composed of two non-overlapping right rectangular prisms		5.MD.C.5c	MEA
OCS Code:	**Strand: *Geometry (G)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMC.G.1	**Graph points on the coordinate plane to solve real-world and mathematical problems.**			
5.SMC.G.1.1-1.a	Define a coordinate system using a pair of perpendicular number lines that intersect with the 0 and a given point located by using an ordered pair of numbers	e.g., A pair of perpendicular number lines are called axes, the intersection of number lines is called the origin, and an ordered pair of numbers are called coordinates	5.G.A.1	GRE
5.SMC.G.1.1-2.a	Identify that in an ordered pair of numbers located in a plane, the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis	e.g., x-axis and x-coordinate, y-axis and y-coordinate	5.G.A.1	GRE
5.SMC.G.1.1-3.a	Identify that in an ordered pair of numbers located in a plane, the names of the two axes and the coordinates correspond		5.G.A.1	GRE
5.SMC.G.1.2-1.b	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane		5.G.A.2	GRE
5.SMC.G.1.2-2.b	Solve real world and mathematical problems by interpreting coordinate values of points in the first quadrant of the coordinate plane		5.G.A.2	GRE
5.SMC.G.2	**Classify two-dimensional figures into categories based on their properties.**			
5.SMC.G.2.1.c	Compare the attributes belonging to a category of two-dimensional figures to the attributes of all subcategories of that category	e.g., All rectangles have four right angles and squares are rectangles, so all squares have four right angles	5.G.B.3	MEA

5.SMC.G.2.2.c	Classify two-dimensional figures in a hierarchy based on properties		5.G.B.4	MEA
DOMAIN: Standards for Mathematical Practices				
OCS Code:	**Strand: *Solve Problems (MP1)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.1	**1. Make sense of problems and persevere in solving them.**			
5.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:**
5.SMP.2	**2. Reason abstractly and quantitatively.**			
5.SMP.2.c	Reason abstractly and quantitatively		MP2	
OCS Code:	**Strand: *Construct Arguments (MP3)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.3	**3. Construct viable arguments and critique the reasoning of others.**			
5.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:**
5.SMP.4	**4. Model with mathematics.**			
5.SMP.4.c	Model with mathematics		MP4	
OCS Code:	**Strand: *Use Tools (MP5)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.5	**5. Use appropriate tools strategically.**			
5.SMP.5.c	Use appropriate tools strategically		MP5	
OCS Code:	**Strand: *Attend to Precision (MP6)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.6	**6. Attend to precision.**			
5.SMP.6.c	Attend to precision		MP6	
OCS Code:	**Strand: *Use Structure (MP7)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.7	**7. Look for and make use of structure.**			
5.SMP.7.c	Look for and make use of structure		MP7	
OCS Code:	**Strand: *Express Regularity (MP8)***	**Examples and Notes:**	**CCSS Code:**	**CRS Strand:**
5.SMP.8	**8. Look for and express regularity in repeated reasoning.**			
5.SMP.8.c	Look for and express regularity in repeated reasoning		MP8	