# BENCHMARKS WITH EXAMPLES REPORT
# MATHEMATICS GRADE 4

ARCHDIOCESE CHICAGO CATHOLIC SCHOOLS

**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 | | | | | |
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| **Status:** | **OCS Code:** | **Strand: *Operations and Algebraic Thinking (OA)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMC.OA.1** | **Use the four operations with whole numbers to solve problems.** | | | |
| Supporting | 4.SMC.OA.1.1-1.a | Interpret a multiplication equation as a comparison | e.g., Interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5 | 4.OA.A.1 | BOA |
| **Focus** | 4.SMC.OA.1.1-2.a | Represent verbal statements of multiplicative comparisons as multiplication equations | | 4.OA.A.1 | BOA |
| **Focus** | 4.SMC.OA.1.2-1.b | Multiply or divide to solve word problems involving multiplicative comparison | e.g., By using drawings and equations with a symbol for the unknown number to represent the problem | 4.OA.A.2 | BOA |
| Supporting | 4.SMC.OA.1.2-2.b | Distinguish multiplicative comparison from additive comparison | | 4.OA.A.2 | BOA |
| **Focus** | 4.SMC.OA.1.3-1.c | Solve multistep word problems involving whole numbers and having whole-number answers | e.g., Using the four operations, including problems in which remainders must be interpreted | 4.OA.A.3 | BOA |
| Supporting | 4.SMC.OA.1.3-2.c | Use equations with a letter standing for the unknown quantity to represent multistep word problems involving whole numbers and having whole-number answers | | 4.OA.A.3 | XEI |
| **Focus** | 4.SMC.OA.1.3-3.c | Use mental computation and estimation strategies to assess the reasonableness of answers to multistep word problems involving whole numbers and having whole number answers | e.g., Strategies include rounding | 4.OA.A.3 | BOA |
| | **4.SMC.OA.2** | **Gain familiarity with factors and multiples.** | | | |
| Supporting | 4.SMC.OA.2.4-1.b | Find all factor pairs for a whole number in the range 1–100 | | 4.OA.B.4 | NCP |
| Supporting | 4.SMC.OA.2.4-2.b | Relate a whole number to a multiple of each of its factors | | 4.OA.B.4 | NCP |
| Supporting | 4.SMC.OA.2.4-3.b | Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number | | 4.OA.B.4 | NCP |
| Supporting | 4.SMC.OA.2.4-4.b | Determine whether a given whole number in the range 1–100 is prime or composite | | 4.OA.B.4 | NCP |
| | **4.SMC.OA.3** | **Generate and analyze patterns.** | | | |
| **Focus** | 4.SMC.OA.3.1-1.c | Generate a number or shape pattern that follows a given rule | e.g., Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers | 4.OA.C.5 | NCP |
| **Focus** | 4.SMC.OA.3.1-2.c | Identify features of a number or shape pattern that were not explicit in the rule itself | e.g., Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers | 4.OA.C.5 | NCP |
| Supporting | 4.SMC.OA.3.1-3.c | Explain why a number pattern alternates between odd and even numbers | e.g., Explain informally | 4.OA.C.5 | NCP |
| **Status:** | **OCS Code:** | **Strand: *Number and Operations in Base Ten (NBT)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMC.NBT.1** | **Generalize place value understanding for multi-digit whole numbers.** | | | |
| Supporting | 4.SMC.NBT.1.1.a | Define the concept of place value by representing that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right | e.g., Recognize that 700 ÷ 70 = 10 by applying concepts of place value and division | 4.NBT.A.1 | NCP |
| Supporting | 4.SMC.NBT.1.2-1.a | Identify multi-digit whole numbers using base-ten numerals, number names and expanded form | | 4.NBT.A.2 | NCP |

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| **Focus** | 4.SMC.NBT.1.2-2.a | Write multi-digit whole numbers using base-ten numerals, number names and expanded form | | 4.NBT.A.2 | NCP |
| Supporting | 4.SMC.NBT.1.2-3.b | Record the results of comparisons between multi-digit numbers using the symbols >, =, and < | e.g., Base comparisons on the meanings of digits in each place | 4.NBT.A.2 | NCP |
| Supporting | 4.SMC.NBT.1.3.b | Round multi-digit whole numbers to any place | e.g., Using place number understanding | 4.NBT.A.3 | NCP |
| | **4.SMC.NBT.2** | **Use place value understanding and properties of operations to perform multi-digit arithmetic.** | | | |
| Supporting | 4.SMC.NBT.2.1.a | Add and subtract multi-digit whole numbers fluently using the standard algorithm | e.g., Using the standard algorithm | 4.NBT.B.4 | BOA |
| **Focus** | 4.SMC.NBT.2.2-1.b | Use strategies based on place value and the properties of operations to multiply a whole number of up to four digits by a one-digit whole number | | 4.NBT.B.5 | BOA |
| Supporting | 4.SMC.NBT.2.2-2.b | Use strategies based on place value and the properties of operations to multiply two two-digit numbers | | 4.NBT.B.5 | BOA |
| **Focus** | 4.SMC.NBT.2.2-3.c | Explain the calculation of multiplying a whole number of up to four digits by a one-digit whole number | e.g., By using equations, rectangular arrays, and/or area models | 4.NBT.B.5 | NCP |
| Supporting | 4.SMC.NBT.2.2-4.c | Explain the calculation of multiplying two two-digit numbers | e.g., By using equations, rectangular arrays, and/or area models | 4.NBT.B.5 | NCP |
| **Focus** | 4.SMC.NBT.2.3-1.b | Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors | Note: Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. | 4.NBT.B.6 | BOA |
| **Focus** | 4.SMC.NBT.2.3-2.c | Explain the calculation of whole-number quotients and remainders with up to four-digit dividends and one-digit divisors | e.g., By using equations, rectangular arrays, and/or area models | 4.NBT.B.6 | NCP |
| **Status:** | **OCS Code:** | **Strand: *Number and Operations - Fractions (NF)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMC.NF.1** | **Extend understanding of fraction equivalence and ordering.** | | | |
| **Focus** | 4.SMC.NF.1.1-1.a | Describe the relationship between a fraction a/b and its equivalent fraction (n × a)/(n × b) by using visual fraction models | Note: Pay attention to how the number and size of the parts differ even though the two fractions themselves are the same size. | 4.NF.A.1 | NCP |
| Supporting | 4.SMC.NF.1.1-2.b | Generate equivalent fractions using the principle that a fraction a/b is equivalent to a fraction (n × a)/(n × b) | | 4.NF.A.1 | NCP |
| Supporting | 4.SMC.NF.1.2-1.b | Compare two fractions with different numerators and different denominators | e.g., By creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2 | 4.NF.A.2 | NCP |
| Supporting | 4.SMC.NF.1.2-2.b | Show that comparisons between two fractions with different numerators and denominators are valid only when the two fractions refer to the same whole | | 4.NF.A.2 | NCP |
| Supporting | 4.SMC.NF.1.2-3.c | Record the results of comparisons of two fractions with different numerators and different denominators using symbols >, =, or < | e.g., By using a visual fraction model | 4.NF.A.2 | NCP |
| | **4.SMC.NF.2** | **Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.** | | | |
| **Focus** | 4.SMC.NF.2.1-1.a | Join parts referring to the same whole when adding fractions | | 4.NF.B.3a | NCP |
| Supporting | 4.SMC.NF.2.1-2.a | Separate parts referring to the same whole when subtracting fractions | | 4.NF.B.3a | NCP |
| Supporting | 4.SMC.NF.2.1-3.b | Write an equation recording the decomposition of a fraction into a sum of fractions with the same denominator | Note: Decompose a fraction in more than one way. | 4.NF.B.3b | BOA |
| Supporting | 4.SMC.NF.2.1-4.c | Justify the decomposition of a fraction into a sum of fractions with the same denominator | e.g., Use a visual fraction model to justify the decomposition of a fraction into a sum of fractions. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8 | 4.NF.B.3b | BOA |
| **Focus** | 4.SMC.NF.2.1-5.b | Add and subtract mixed numbers with like denominators | e.g., By replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction | 4.NF.B.3c | BOA |
| **Focus** | 4.SMC.NF.2.1-6.c | Solve word problems involving addition and subtraction of fractions having like denominators referring to the same whole | e.g., By using visual fraction models and equations to represent the problem | 4.NF.B.3d | BOA |
| Supporting | 4.SMC.NF.2.2-1.a | Demonstrate that a fraction a/b is a multiple of 1/b | e.g., Use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4) | 4.NF.B.4a | NCP |
| Supporting | 4.SMC.NF.2.2-2.b | Multiply a fraction by a whole number to show that a multiple of a/b is a multiple of 1/b | e.g., Use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b) | 4.NF.B.4b | BOA |

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| Supporting | 4.SMC.NF.2.2-3.c | Solve word problems involving multiplication of a fraction by a whole number | e.g., By using visual fraction models and equations to represent the problem. If each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? | 4.NF.B.4c | BOA |
| | **4.SMC.NF.3** | **Understand decimal notation for fractions, and compare decimal fractions.** | | | |
| Supporting | 4.SMC.NF.3.1-1.b | Express a fraction with denominator 10 as an equivalent fraction with denominator 100 | e.g., Express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100 | 4.NF.C.5 | NCP |
| Supporting | 4.SMC.NF.3.1-2.b | Add two fractions with respective denominators 10 and 100 by using the technique of expressing a fraction with denominator 10 as an equivalent fraction with denominator 10 | e.g., Express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100 | 4.NF.C.5 | BOA |
| Supporting | 4.SMC.NF.3.2.b | Translate fractions with denominators 10 or 100 into decimals | e.g., Rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram | 4.NF.C.6 | NCP |
| **Focus** | 4.SMC.NF.3.3-1.c | Compare two decimals to the hundredth place | e.g., By reasoning about their size | 4.NF.C.7 | NCP |
| Supporting | 4.SMC.NF.3.3-2.c | Show that comparisons between two decimals to the hundredth are valid only when the two decimals refer to the same whole | | 4.NF.C.7 | NCP |
| Supporting | 4.SMC.NF.3.3-3.c | Record the results of comparisons of two decimals to hundredths with the symbols >, =, or <, and justify the conclusions | e.g., By using a visual model | 4.NF.C.7 | NCP |
| **Status:** | **OCS Code:** | **Strand: *Measurement and Data (MD)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMC.MD.1** | **Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.** | | | |
| Supporting | 4.SMC.MD.1.1-1.a | Name relative sizes of measurement units within one system of measurement | e.g., Including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec | 4.MD.A.1 | MEA |
| Supporting | 4.SMC.MD.1.1-2.b | Express measurements in a larger unit in terms of a smaller unit within a single system of measurement | e.g., Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in | 4.MD.A.1 | BOA |
| Supporting | 4.SMC.MD.1.1-3.b | Record measurement equivalents in a two column table within a single system of measurement | e.g., Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ... | 4.MD.A.1 | BOA |
| Supporting | 4.SMC.MD.1.2-1.c | Use the four operations to solve word problems involving simple fractions | Note: Involving distances, intervals of time, liquid volumes, masses of objects, and money. | 4.MD.A.2 | BOA |
| **Focus** | 4.SMC.MD.1.2-2.c | Use the four operations to solve word problems involving decimals | Note: Involving distances, intervals of time, liquid volumes, masses of objects, and money. | 4.MD.A.2 | BOA |
| **Focus** | 4.SMC.MD.1.2-3.c | Use the four operations to solve word problems that require expressing measurements given in a larger unit in terms of a smaller unit | Note: Involving distances, intervals of time, liquid volumes, masses of objects, and money. | 4.MD.A.2 | BOA |
| **Focus** | 4.SMC.MD.1.2-4.c | Represent measurement quantities using diagrams to solve word problems | e.g., Number line diagrams that feature a measurement scale | 4.MD.A.2 | MEA |
| **Focus** | 4.SMC.MD.1.3-1.c | Apply the area formula for rectangles in real world and mathematical problems | e.g., Find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor | 4.MD.A.3 | MEA |
| **Focus** | 4.SMC.MD.1.3-2.c | Apply the perimeter formula for rectangles in real world and mathematical problems | | 4.MD.A.3 | MEA |
| | **4.SMC.MD.2** | **Represent and interpret data.** | | | |
| **Focus** | 4.SMC.MD.2.1-1.c | Make a line plot to display a data set of measurements in fractions of a unit | e.g., 1/2, 1/4, 1/8 | 4.MD.B.4 | PSD |
| **Focus** | 4.SMC.MD.2.1-2.c | Solve problems involving addition and subtraction of fractions by using information presented in line plots | e.g., From a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection | 4.MD.B.4 | PSD |
| | **4.SMC.MD.3** | **Geometric measurement: understand concepts of angle and measure angles.** | | | |
| Supporting | 4.SMC.MD.3.1-1.b | Show that an angle is measured with reference to a circle with its center at the common endpoint of the rays | Note: By considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. | 4.MD.C.5a | PPF |
| Supporting | 4.SMC.MD.3.1-2.a | Show that an angle that turns through n one-degree angles has an angle measurement of n degrees | | 4.MD.C.5b | PPF |

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| Supporting | 4.SMC.MD.3.2-1.b | Measure angles in whole-number degrees using a protractor | | 4.MD.C.6 | PPF |
| Supporting | 4.SMC.MD.3.2-2.b | Sketch angles of specified measure in whole-number degrees using a protractor | | 4.MD.C.6 | PPF |
| Supporting | 4.SMC.MD.3.3-1.b | Show that angle measure is additive | Note: When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. | 4.MD.C.7 | PPF |
| Supporting | 4.SMC.MD.3.3-2.c | Use a diagram to find unknown angles in solving real world addition and subtraction problems | e.g., By using an equation with a symbol for the unknown angle measure | 4.MD.C.7 | PPF |
| **Status:** | **OCS Code:** | **Strand: *Geometry (G)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMC.G.1** | **Draw and identify lines and angles, and classify shapes by properties of their lines and angles.** | | | |
| Supporting | 4.SMC.G.1.1-1.a | Draw points, lines, line segments, rays, angles, perpendicular lines, and parallel lines | e.g., Angles that are right, acute, or obtuse | 4.G.A.1 | PPF |
| **Focus** | 4.SMC.G.1.1-2.a | Identify points, lines, line segments, rays, angles, perpendicular, and parallel lines in two-dimensional figures | e.g., Angles that are right, acute, or obtuse | 4.G.A.1 | PPF |
| Supporting | 4.SMC.G.1.2-1.b | Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines | | 4.G.A.2 | PPF |
| Supporting | 4.SMC.G.1.2-2.b | Classify two-dimensional figures based on the presence or absence of angles of a specified size | | 4.G.A.2 | PPF |
| Supporting | 4.SMC.G.1.2-3.b | Classify right triangles as a category of angles | | 4.G.A.2 | PPF |
| Supporting | 4.SMC.G.1.2-4.b | Identify right triangles | | 4.G.A.2 | PPF |
| Supporting | 4.SMC.G.1.3-1.b | Express a line of symmetry for a two-dimensional figure as a line across the figure | e.g., The figure can be folded along the line into matching parts | 4.G.A.3 | MEA |
| Supporting | 4.SMC.G.1.3-2.c | Identify line-symmetric figures for a two-dimensional figure | | 4.G.A.3 | MEA |
| Supporting | 4.SMC.G.1.3-3.c | Draw lines of symmetry for a two-dimensional figure | | 4.G.A.3 | MEA |
| | | **DOMAIN: Standards for Mathematical Practices** | | | |
| **Status:** | **OCS Code:** | **Strand: *Solve Problems (MP1)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.1** | **1. Make sense of problems and persevere in solving them.** | | | |
| Supporting | 4.SMP.1.c | Make sense of problems and persevere in solving them | | MP1 | |
| **Status:** | **OCS Code:** | **Strand: *Reason (MP2)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.2** | **2. Reason abstractly and quantitatively.** | | | |
| **Focus** | 4.SMP.2.c | Reason abstractly and quantitatively | | MP2 | |
| **Status:** | **OCS Code:** | **Strand: *Construct Arguments (MP3)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.3** | **3. Construct viable arguments and critique the reasoning of others.** | | | |
| Supporting | 4.SMP.3.c | Construct viable arguments and critique the reasoning of others | | MP3 | |
| **Status:** | **OCS Code:** | **Strand: *Model (MP4)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.4** | **4. Model with mathematics.** | | | |
| Supporting | 4.SMP.4.c | Model with mathematics | | MP4 | |
| **Status:** | **OCS Code:** | **Strand: *Use Tools (MP5)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.5** | **5. Use appropriate tools strategically.** | | | |
| **Focus** | 4.SMP.5.c | Use appropriate tools strategically | | MP5 | |
| **Status:** | **OCS Code:** | **Strand: *Attend to Precision (MP6)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.6** | **6. Attend to precision.** | | | |
| **Focus** | 4.SMP.6.c | Attend to precision | | MP6 | |
| **Status:** | **OCS Code:** | **Strand: *Use Structure (MP7)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |

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| | **4.SMP.7** | **7. Look for and make use of structure.** | | | |
| **Focus** | 4.SMP.7.c | Look for and make use of structure | | MP7 | |
| **Status:** | **OCS Code:** | **Strand: *Express Regularity (MP8)*** | **Examples and Notes:** | **CCSS Code:** | **CRS Strand:** |
| | **4.SMP.8** | **8. Look for and express regularity in repeated reasoning.** | | | |
| Supporting | 4.SMP.8.c | Look for and express regularity in repeated reasoning | | MP8 | |