

BENCHMARKS WITH EXAMPLES REPORT

MATHEMATICS GRADE 4



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: <i>Operations and Algebraic Thinking (OA)</i>	Examples and Notes:	CCSS Code:	CRS Strand:
4.SMC.OA.1	Use the four operations with whole numbers to solve problems.			
4.SMC.OA.1.1-1.a	Interpret a multiplication equation as a comparison	e.g., Interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5	4.OA.A.1	BOA
4.SMC.OA.1.1-2.a	Represent verbal statements of multiplicative comparisons as multiplication equations		4.OA.A.1	BOA
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
4.SMC.OA.1.2-2.b	Distinguish multiplicative comparison from additive comparison		4.OA.A.2	BOA
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
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
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.			
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
4.SMC.OA.2.4-2.b	Relate a whole number to a multiple of each of its factors		4.OA.B.4	NCP
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
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.			
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
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
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
OCS Code:	Strand: <i>Number and Operations in Base Ten (NBT)</i>	Examples and Notes:	CCSS Code:	CRS Strand:
4.SMC.NBT.1	Generalize place value understanding for multi-digit whole numbers.			

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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 $700 \div 70 = 10$ by applying concepts of place value and division	4.NBT.A.1	NCP
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
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
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
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.			
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
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
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
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
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
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
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
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.			
4.SMC.NF.1.1-1.a	Describe the relationship between a fraction a/b and its equivalent fraction $(n \times a)/(n \times b)$ 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
4.SMC.NF.1.1-2.b	Generate equivalent fractions using the principle that a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$		4.NF.A.1	NCP
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
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
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.			
4.SMC.NF.2.1-1.a	Join parts referring to the same whole when adding fractions		4.NF.B.3a	NCP
4.SMC.NF.2.1-2.a	Separate parts referring to the same whole when subtracting fractions		4.NF.B.3a	NCP
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
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: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$	4.NF.B.3b	BOA



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
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
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 $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$	4.NF.B.4a	NCP
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 $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$)	4.NF.B.4b	BOA
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.			
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
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 100	e.g., Express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$	4.NF.C.5	BOA
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
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
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
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
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.			
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
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
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
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
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
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
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
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
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.			
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
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.			
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
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
4.SMC.MD.3.2-1.b	Measure angles in whole-number degrees using a protractor		4.MD.C.6	PPF
4.SMC.MD.3.2-2.b	Sketch angles of specified measure in whole-number degrees using a protractor		4.MD.C.6	PPF
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
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
OCS Code:	Strand: <i>Geometry (G)</i>	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.			
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
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
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
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
4.SMC.G.1.2-3.b	Classify right triangles as a category of angles		4.G.A.2	PPF
4.SMC.G.1.2-4.b	Identify right triangles		4.G.A.2	PPF
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
4.SMC.G.1.3-2.c	Identify line-symmetric figures for a two-dimensional figure		4.G.A.3	MEA
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				
OCS Code:	Strand: <i>Solve Problems (MP1)</i>	Examples and Notes:	CCSS Code:	CRS Strand:
4.SMP.1	1. Make sense of problems and persevere in solving them.			
4.SMP.1.c	Make sense of problems and persevere in solving them		MP1	
OCS Code:	Strand: <i>Reason (MP2)</i>	Examples and Notes:	CCSS Code:	CRS Strand:
4.SMP.2	2. Reason abstractly and quantitatively.			
4.SMP.2.c	Reason abstractly and quantitatively		MP2	
OCS Code:	Strand: <i>Construct Arguments (MP3)</i>	Examples and Notes:	CCSS Code:	CRS Strand:

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