Grade 4 Mathematics

Performance Level Descriptors

Introduction

The federal government requires states to adopt and assess standards and report assessment results using three or more levels. Federal guidance specifies that state's academic performance levels must include descriptions of the content-based competencies associated with each level. The descriptions, referred to as Performance Level Descriptors (PLDs), convey the degree of student achievement at each level. The Maryland Comprehensive Assessment Program (MACP) Policy, Content, and Range PLDs are included in this document.

MCAP Policy Performance Level Descriptors

The MCAP Policy PLDS provide high-level descriptions of a student's ability to apply the knowledge and skills defined by the Maryland Content Standards for English Language Arts (ELA), Mathematics, Science, and Social Studies as demonstrated by their performance on MCAP assessments. Maryland elected to use the four performance levels, described below, when reporting assessment results.

Performance Level	MCAP Policy Performance Level Descriptors
4	**Distinguished Learners** demonstrate advanced proficiency. The students are well prepared for the next grade level or course and are well prepared for college and career readiness.
3	**Proficient Learners** demonstrate proficiency. The students are prepared for the next grade level or course and are on track for college and career readiness.
2	**Developing Learners** demonstrate partial proficiency. The students need additional academic support to ensure success in the next grade level or course and to be on track for college and career readiness.
1	**Beginning Learners** do not yet demonstrate proficiency. The students need substantial academic support to be prepared for the next grade level or course and to be on track for college and career readiness.

MCAP Mathematics Content Performance Level Descriptors

The results from each MCAP Mathematics assessment are reported using four performance levels. Mathematics Content PLDs for Grade 4 provide broad descriptions of what a student performing at each level means in terms of the mathematics content for the grade.

Grade 4

Performance Level	MCAP Mathematics Content Performance Level Descriptors for Grade 4
4	**Distinguished Learners** demonstrate advanced proficiency in solving complex problems involving mathematical operations, fractions, measurement, data, and geometry, and demonstrates an ability to connect multiple grade-level concepts to conceptualize and apply mathematics to model, reason through, and solve problems efficiently, and relate mathematics to the real world.
3	**Proficient Learners** demonstrate proficiency in solving problems involving mathematical operations, fractions, measurement, data, and geometry, and demonstrates an ability to conceptualize and apply mathematics to model, reason through, and solve problems efficiently, and relate mathematics to the real world.
2	**Developing Learners** demonstrate partial proficiency in solving problems involving mathematical operations, fractions, measurement, data, and geometry, and may need some support in conceptualizing and applying mathematics to model, reason through, and solve problems efficiently, and in relating mathematics to the real world.
1	**Beginning Learners** do not yet demonstrate proficiency in solving problems involving mathematical operations, fractions, measurement, data, and geometry where the required mathematics is either directly indicated or uses common grade level procedures, and typically needs support in conceptualizing and applying mathematics to model, reason through, and solve problems efficiently, and in relating mathematics to the real world.

MCAP Mathematics Range Performance Level Descriptors

Range PLDs are grade/course specific descriptors of the cognitive and content level rigor expected at each performance level. The individual grade-level/course PLD documents provide robust descriptions associated with specific content. To show proficiency of the Maryland College and Career Readiness Standards, students must demonstrate their knowledge and skills as described by the Level 3 and Level 4 PLDs.

4.OA Operations and Algebraic Thinking

4.OA.A Use the four operations with whole numbers to solve problems.

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.A.2 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, distinguishing multiplicative comparison from additive comparison.

4.OA.A.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders are interpreted or not interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.C Generalize and analyze patterns.

4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, 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. Explain informally why the numbers will continue to alternate in this way.*

Evidence Statement Codes	Level 4 - Distinguished *A student performing at this level should be able to:*	Level 3 - Proficient *A student performing at this level should be able to:*	Level 2 - Developing *A student performing at this level should be able to:*	Level 1 - Beginning *A student performing at this level should be able to:*
4.OA.A.1 4.OA.A.2	apply an understanding of multiplicative comparison equations and statements to solve problems that may require connecting multiple grade-level concepts.	interpret and solve mathematical (little to no context) and word problems that involve multiplicative comparison when the group size is unknown. Represent multiplicative comparison as a multiplication equation with a symbol for the unknown.	interpret and solve mathematical (little to no context) and word problems that involve multiplicative comparison with the language "times as many" or "product unknown". Represent multiplicative comparison as a multiplication equation.	interpret and solve mathematical (little to no context) and word problems that involve multiplicative comparison problems with product unknown. Represent multiplicative comparison as a multiplication equation.
4.OA.A.3	apply an understanding of the four operations, including interpreting remainders, and the properties of operations to solve problems that require connecting multiple grade-level concepts.	solve multi-step word problems using the four operations; decide if and how a remainder is interpreted when appropriate. Represent these problems using equations with a letter standing for the unknown quantity.	solve multi-step word problems using the four operations involving numbers within one thousand. (Division problems should have a remainder.) Represent these problems using equations with a letter standing for the unknown quantity.	solve multi-step word problems using the four operations involving numbers within one hundred. (Division problems do not have remainders.) Represent these problems using equations with a letter for the unknown quantity.

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4.OA.C.5	apply an understanding of number or shape patterns to solve problems that require connecting multiple-grade level concepts.	create or explain a number or shape pattern when given a rule and identify apparent features of the pattern that are not explicit in the rule itself.	create, identify or explain a number or shape pattern when given a rule.	extend a number or shape pattern when given a rule.

4.NBT Numbers and Operations in Base Ten

4NBT.A Generalize place value understanding for multi-digit whole numbers.

4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represent in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*

4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.

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4.NBT.A.1	apply an understanding of place value to solve problems that require connecting multiple grade- level concepts.	determine that in any multi-digit whole number, a digit in one place represents 10 times as much as the digit to its right. Explain the relationship using words or equations with numbers between 1,000 and 1,000,000.	determine that in any multi-digit whole number, a digit in one place represents 10 times as much as the digit to its right using numbers between 1,000 and 1,000,000.	identify the value of a digit based on its place value using numbers between 1,000 and 1,000,000.
4.NBT.A.2	apply an understanding of place value to solve problems that require connecting multiple grade- level concepts.	read and write multi-digit whole numbers using any of the representations given in the standard. Compare two multi-digit numbers based on the meanings of the digits in each place using comparison symbols with numbers between 100,000 and 1,000,000.	read and write multi-digit whole numbers using any of the representations given in the standard. Compare two multi-digit numbers based on the meanings of the digits in each place using comparison symbols with numbers between 10,000 and 100,000.	read and write multi-digit whole numbers using any of the representations given in the standard. Compare two multi-digit numbers based on the meanings of the digits in each place using comparison symbols with numbers between 1,000 and 10,000.
4.NBT.A.3	apply an understanding of place value to solve problems that require connecting multiple grade- level concepts.	use place value understanding to round multi-digit whole numbers to any place using numbers to 1,000,000.	use place value understanding to round multi-digit whole numbers in any place using numbers to 10,000 to 100,000.	use place value understanding to round multi-digit whole numbers in any place using numbers to 1,000 to 10,000.

4.NBT Number and Operations in Base Ten

4.NBT.B Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

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4.NBT.B.4	accurately add and subtract multi-digit numbers to solve problems that require connecting multiple grade-level concepts.	accurately add and subtract multi-digit whole numbers using the standard algorithm.	accurately add and subtract multi-digit numbers using place value strategies (addends in the task could suggest an ad hoc or mental strategy).	accurately add and subtract multi-digit numbers without regrouping using place value strategies (addends in the task could suggest an ad hoc or mental strategy).
4.NBT.B.5 4.NBT.B.6	Apply an understanding of place value, properties of operations, and the relationship between multiplication and division to solve problems that require connecting multiple grade-level concepts.	multiply up to four-digit by and one-digit whole numbers and two 2-digit whole numbers. Divide multi-digit whole number quotients, with and without remainders, using up to four-digit dividends and one-digit divisors using strategies based on place value, properties of operations, and/or the relationship between multiplication and division.	multiply up to four-digit by one-digit whole numbers. Divide whole number quotients without a remainder with up to three-digit dividends and one-digit divisors using strategies based on place value, properties of operations, and/or the relationship between multiplication and division.	multiply up to two-digit by one-digit whole numbers. Divide up to two-digit numbers by one-digit numbers with and without a remainder, using strategies based on place value, properties of operations and/or the relationship between multiplication and division.

4.NF Number and Operations – Fractions

Grade 4 is limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.

4.NF.A Extend understanding of fraction equivalence and ordering.

4.NF.A.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.A.2 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 $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, <, and justify the conclusion, e.g., by using a visual fraction model.

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4.NF.A.1	apply an understanding of equivalent fractions and comparison of fractions to solve problems that require connecting multiple grade-level concepts.	use (*n* x *a*)/(*n* x *b*) to identify, generate, and explain equivalent fractions using visual fraction models.	use (*n* x *a*)/(*n* x *b*) to identify and generate equivalent fractions using visual fraction models.	use (*n* x *a*)/(*n* x *b*) to identify equivalent fractions using visual fraction models.
4.NF.A.2	apply an understanding of equivalent fractions and comparison of fractions to solve problems that require connecting multiple grade-level concepts.	compare two fractions with different denominators and different numerators by creating common numerators or denominators or comparing to a benchmark fraction. Record comparisons using symbols <, >, =.	compare two fractions (not larger than 2) with different denominators (5, 10, 12, and 100) and different numerators by creating common numerators or denominators or comparing to a benchmark fraction. Record comparisons using symbols <, >, =.	compare two fractions (less than 1) with different numerators and/or different denominators of 2, 3, 4, 6, and 8 using visual fraction models and comparison symbols <, >, =.

4.NF.B Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.

4.NF.B.3 Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.

b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition as an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ or $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$ or $2\frac{1}{8} = 1 + 1 + \frac{1}{8}$ or $2\frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$

c. 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.

d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

4.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

a. Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. *For example, use a visual fraction model to represent* $\frac{5}{4}$ *as the product of* $5 \times \frac{1}{4}$*, recording the conclusion by the equation* $\frac{5}{4} = 5 \times \frac{1}{4}$.

b. Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express* $3 \times \frac{2}{5}$ *as* $6 \times \frac{1}{5}$*, recognizing this product as* $\frac{6}{5}$*. (In general,* $n \times \frac{a}{b} = \frac{n \times a}{b}$*.)*

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. *For example, if a person at a party will eat* $\frac{3}{8}$ *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?*

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4.NF.B.3b	apply an understanding composing and decomposing fractions in multiple ways to solve problems that require connecting multiple grade-level concepts.	decompose fractions into a sum of fractions with the same denominator in more than one way. Record each decomposition as an equation.	decompose fractions into a sum of fractions with the same denominator (using denominators of 2, 3, 4, 5, 6, 8, 12) at least two ways. Record each decomposition as an equation.	decompose fractions into a sum of fractions with the same denominator (using denominators of 2, 3, 4 ,6, 8) in at least one way. Record each decomposition as an equation.
4.NF.B.3c	Accurately add and subtract mixed numbers with like denominators to solve problems that require connecting multiple grade-level concepts.	add and subtract fractions and mixed numbers with like denominators.	add and subtract mixed numbers with like denominators and the fractional part does not exceed one	add and subtract fractions with like denominators with a sum less than one.

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4.NF.B.3d	apply an understanding of fraction computation to add and subtract fractions and mixed numbers with like denominators to solve problems that require connecting multiple grade-level concepts.	solve word problems involving addition and subtraction of fractions that may or may not be greater than 1, and referring to the same size whole with like denominators.	solve word problems involving addition and subtraction of fractions with like denominators with numerators and denominators limited to only 2, 3, 4, 5, 6, 8.	solve word problems involving addition and subtraction of fractions with like denominators with a sum less than one and, limit numerators and denominators to 2, 3, 4, 6, 8.
4.NF.B.4a 4.NF.B.4b	apply an understanding of fraction computation to multiply a fraction times a whole number to solve problems that require connecting multiple grade-level concepts.	demonstrate that a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number.	use a visual fraction model to represent $\frac{a}{b}$ as the product of a whole number times a unit fraction.	use repeated addition of unit fractions to represent as $\frac{a}{b}$ as a multiple of $\frac{1}{b}$.
4.NF.B.4c	apply an understanding of fraction computation to multiply a fraction times a whole number to solve problems that require connecting multiple grade-level concepts.	solve a variety of word problems involving multiplying a fraction by a whole number.	solve one-step word problems involving multiplying a non-unit fraction by a whole number.	solve one-step word problems involving multiplying a unit fraction by a whole number.

4.NF.C Understand decimal notation for fractions, and compare decimal fractions.

4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, when adding* $\frac{3}{10}$ *as* $\frac{4}{100}$ *express* $\frac{3}{10}$ *as* $\frac{30}{100}$*, then* $\frac{30}{100} + \frac{4}{100} = \frac{34}{100}$.

4.NF.C.6 Use decimal notation for fractions with denominators 10 and 100. *For example, rewrite 0.62 as* $\frac{62}{100}$ *or describe a length as 0.62 meters or locate 0.62 on a number line diagram.*

4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, <, and justify the conclusions, e.g., by using a visual model.

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4.NF.C.5	apply an understanding of decimal notation for fractions and compare decimals to solve problems that require connecting multiple grade-level concepts.	express a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100 and use equivalent fractions to add two fractions with respective denominators of 10 and 100.	express a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100 and add two fractions with like denominators of 10 or like denominators of 100.	express fractions with a denominator of 10 to an equivalent fraction with a denominator of 100.
4.NF.C.6	apply an understanding of decimal notation for fractions and compare decimals to solve problems that require connecting multiple grade-level concepts.	use decimal notation for fractions with denominators of 10 and 100.	use decimal notation for fractions (less than or equal to 1) with denominators of 10 and 100.	use decimal notation for fractions (less than or equal to 1) with denominators of 10.
4.NF.C.7	apply an understanding of decimal notation for fractions and compare decimals to solve problems that require connecting multiple grade-level concepts.	compare two decimals to hundredths and record the results of the comparisons with the correct comparison symbols >, <, =.	compare two decimals, tenths to tenths and hundredths to hundredths and record the results of the comparisons with the correct comparison symbols >, <, =.	compare two decimals in tenths, record the results of the comparisons with the correct comparison symbols >, <, =. compare two decimals in tenths, record the results of the comparisons with the correct comparison symbols >, <, =.

4.MD Measurement and Data

4.MD.A Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm, kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), etc.*

4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formulas as a multiplication equation with an unknown factor.*

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4.MD.A.1	apply an understanding of measurement systems, conversion of measurement, area and perimeter to solve problems that require connecting multiple grade-level concepts.	express measurements in a larger unit in terms of a smaller unit within a single measurement system. Record measurement equivalents in a two-column table.	express measurements in a larger unit in terms of a smaller unit within a single measurement system. Record measurement equivalents by completing a partially filled two-column table.	identify which unit, within a measurement system, is larger or smaller than the other.
4.MD.A.2	apply an understanding of measurement systems, conversion of measurement, area and perimeter to solve problems that require connecting multiple grade-level concepts.	use the four operations to solve problems involving one measurement system, fractions or decimals, and the conversion of measurements from a larger unit to a smaller unit.	use the four operations to solve problems involving one measurement system, simple fractions or decimals (tenths) and the conversion of measurements from a larger unit to a smaller unit.	use the four operations to solve word problems involving measurement within one system using only whole numbers and involving the conversion of measurements from a larger unit to a smaller unit.
4.MD.A.3	apply an understanding of measurement systems, conversion of measurement, area and perimeter to solve problems that require connecting multiple grade-level concepts.	solve multi-step word and mathematical problems involving the formulas for both area and/or perimeter of rectangles.	solve mathematical and word problems involving the formulas to find area or perimeter of rectangles to find missing lengths.	solve area or perimeter mathematical and word problems with the length and width given using whole numbers within the grade NBT limits.

4.MD.B Represent and interpret data.

4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

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4.MD.B.4	apply an understanding of line plots to solve problems that require connecting multiple grade-level concepts.	complete and/or interpret a line plot with a given data set and use the data from the line plot to solve a variety of problems involving addition and subtraction of fractions.	use the data from the line plot to solve one- or two-step problems involving addition or subtraction of fractions.	complete and/or interpret a line plot given a data set of measurement in fractions where some of the tick marks are labeled. Answer questions specific to the data on the line plot.

4.MD.C Geometric measurement: understand concepts of angle and measure angles.

4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.C.7 Recognize angle measure as additive. 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. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

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4.MD.C.5b	use the relationships between a circle and an angle to identify the measure of the angle to solve problems that require connecting multiple grade-level concepts.	use the relationships between a circle and an angle to identify the measure of the angle.	use the relationships between a circle and an angle to identify the measure of the angle less than 180 degrees.	use the relationships between a circle and an angle to identify the measure of the angle less than 90 degrees.
4.MD.C.6	measure angles in whole number degrees to 360 using a protractor.	use a protractor to measure an identified angle in a polygon or other context using whole number degrees.	use a protractor to measure an angle with no horizontal or vertical arms using whole number degrees.	measure an angle with at least one horizontal or vertical arm with the protractor superimposed on the angle.
4.MD.C.7	apply an understanding of angles and angle measurement to solve problems that require connecting multiple grade-level concepts.	solve addition and subtraction problems to find the unknown angles on a diagram in real-world and mathematical problems by using an equation with a symbol for the unknown angle measure	solve one-step addition or subtraction problems to find the unknown angles on a diagram in real-world and mathematical problems using an equation with a symbol for the unknown angle measure.	use addition to solve one-step problems involving finding the measurement of an angle that has been decomposed into parts.

4.G Geometry

4.G.A Draw and identify lines and angles, and classify shape by properties of their lines and angles.

4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

4.G.A.3 Recognize a line of symmetry for a two- dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

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4.G.A.1	apply an understanding of lines and angles to identify two-dimensional figures to solve problems that require connecting multiple grade-level concepts.	identify lines, line segments, rays, angles and perpendicular and parallel lines in two-dimensional figures.	identify lines, line segments, rays, angles in two-dimensional figures.	identify the three types of angles in two-dimensional figures.
4.G.A.2	apply an understanding of lines and angles to classify two-dimensional figures to solve problems that require connecting multiple grade-level concepts.	classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or presence or absence of angles of a specific size, recognize right triangles as a category and identify right triangles.	classify two-dimensional figures based on presences of parallel or perpendicular lines or right angles, recognize right triangles.	classify two-dimensional figures based on the presence of parallel lines or right angles.
4.G.A.3	apply an understanding of symmetry to solve problems that require connecting multiple grade-level concepts.	identify multiple lines of symmetry for two-dimensional figures.	identify two lines of symmetry for two-dimensional figures.	recognize one line of symmetry for two-dimensional figures.

Reasoning Performance Level Descriptors

All reasoning assessment items connect to both the Grade 4 reasoning evidence statements and the content evidence statements.

Students must provide evidence of their ability to reason mathematically by responding to:

- one-point machine scored items. For one-point reasoning items, refer to the associated content PLDs.
- three-point constructed response items. For three-point reasoning items, refer to both the reasoning PLDs below and the associated content PLDs.

Reasoning Evidence Statements

4.R.1 Base reasoning or explanations on a given pictorial representation and explain how the pictorial model represents a mathematical concept or how it can be used to justify or refute a statement (with or without flaws) or how it can be used to make a generalization.

4.R.2 Identify flawed thinking/reasoning and explain how to correct the thinking or work.

4.R.3 Prove or disprove a statement, conjecture, or generalization, using correct and precise mathematical examples.

4.R.4 Reason mathematically to create or analyze a correct and precise solution to a real-world problem and be able to explain why the answer is mathematically correct.

Level 4 - Distinguished *A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:*	**Level 3 - Proficient** *A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:*	**Level 2 - Developing** *A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:*	**Level 1 - Beginning** *A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:*
a sophisticated chain of reasoning.	a well-developed chain of reasoning.	a partially developed, valid chain of reasoning.	the beginning of a chain of reasoning.
a precise, logical solution pathway.	a logical solution pathway that may contain minor flaws.	a solution pathway that contains some correct processes yielding an incorrect solution.	an attempted solution pathway.
an extensive command of mathematical representations and vocabulary.	a proficient command of mathematical representations and vocabulary.	an understanding of some mathematical representations and vocabulary.	a developing understanding of some mathematical representations and vocabulary.

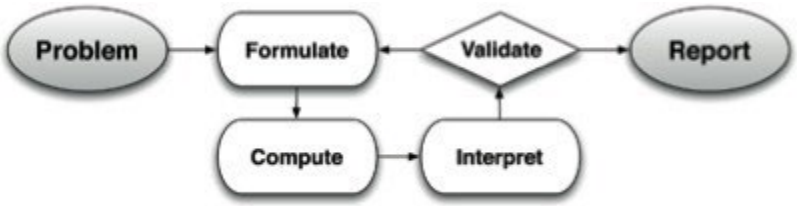
Modeling Performance Level Descriptors

All modeling assessment items connect to both the Grade 4 modeling evidence statements and the content evidence statements.

Students must provide evidence of their ability to use one or more steps of the modeling cycle by responding to:

- one-point machine scored items. For one-point modeling items, refer to the associated content PLDs.
- three-point constructed response items. For three-point modeling items, refer to both the modeling PLDs below and the associated content PLDs.

Modeling Cycle



Modeling Evidence Statements

4.M.1-1	Determine the problem that needs to be solved in a real-world situation.
4.M.1-2	Determine the information that is needed to solve a problem in a given real-world situation.
4.M.1-3	Identify the mathematics that is needed to create a solution path for a real-world situation.
4.M.1-4	Create a solution path that represents the mathematics needed to solve a real-world situation.
4.M.1-5	Evaluate a partial or complete solution path to a real-world situation.

Level 4 - Distinguished *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 3 - Proficient** *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 2 - Developing** *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 1 - Beginning** *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*
determining the information or mathematics needed to solve a problem that requires connecting multiple grade-level concepts.	determining needed information or mathematics.	Identifying needed information or mathematics.	Identifying some needed information or mathematics.
communicating an accurate, organized solution path aligned to the problem using appropriate, effective, and precise representations.	communicating an accurate, organized solution path aligned to the problem using appropriate, effective, and precise representations that may contain minor flaws.	communicating a partial solution path that may contain mathematical errors.	communicating the beginning of a solution path, containing mathematical errors.
evaluating or validating a solution path or showing how to improve a model or correct a given solution.	evaluating or validating a solution path or showing how to improve a model, but work may include minor flaws.	partially validating a solution path or incorrectly improving the model.	attempting to validate a solution path.