



Maryland Comprehensive
Assessment Program

Grade 5

Performance Level Descriptors

Maryland State Department of Education

August 2021



MCAP Grade 5 Performance Level Descriptors (PLDs)

Content Subclaim

Domain: Operations and Algebraic Thinking

5.OA.A: Write and interpret numerical expressions.

5.OA.B: Analyze patterns and relationships.

Evidence Statements:

- **5.OA.A.1** - Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- **5.OA.A.2** - Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
- **5.OA.B.3** - Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. (This evidence statement only assesses the first two sentences of the standard. The second part of the standard, creating and placing ordered pairs is assessed with 5.G.A.1 and 5.G.A.2)

Evidence Statement Code	Level 4 <i>A student performing at this level should be able to:</i>	Level 3 <i>A student performing at this level should be able to:</i>	Level 2 <i>A student performing at this level should be able to:</i>	Level 1 <i>A student performing at this level should be able to:</i>
5.OA.A.1 5.OA.A.2	interpret and write numerical expressions and determine when and where grouping symbols are needed to solve problems that require multiple grade-level concepts.	evaluate or write expressions with grouping symbols involving fractions, decimals, or whole numbers involving three or more terms, and multiple operations.	evaluate or write expressions with grouping symbols involving whole numbers, three or more terms, and multiple operations.	evaluate or write expressions with grouping symbols using whole numbers, three terms, the same operation, and one set of parentheses.
5.OA.B.3	generate and analyze two numerical patterns using two given rules to solve problems that require multiple grade-level concepts.	generate two numerical patterns using two given rules and identify the relationships between the corresponding terms.	continue two given numerical patterns when given the rules.	apply a rule beginning at different starting points.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Number and Operations in Base Ten

5.NBT.A: Understand the place value system.

Evidence Statements:

- **5.NBT.A.1** - Recognize 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 and 1/10 of what it represents in the place to its left.
- **5.NBT.A.2** - Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.
- **5.NBT.A.3a** - Read and write decimals to thousandths using base-ten numerals, number names, and expanded form.
- **5.NBT.A.3b** - Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
- **5.NBT.A.4** - Use place value understanding to round decimals to any place.

Evidence Statement Code	Level 4 <i>A student performing at this level should be able to:</i>	Level 3 <i>A student performing at this level should be able to:</i>	Level 2 <i>A student performing at this level should be able to:</i>	Level 1 <i>A student performing at this level should be able to:</i>
5.NBT.A.1	apply the concepts of creating patterns by multiplying a number by the powers of ten and the placement of the decimal point. Read, write and compare decimals in various forms to solve problems that require multiple grade-level concepts.	recognize how the value of a digit relates to place values (right or left) through thousandths.	use models, tables and/or diagrams to recognize how the value of a digit relates to place values (right or left) through thousandths.	recognize how the value of a digit relates to adjacent (right or left) place values through thousandths.
5.NBT.A.2		use patterns in the number of zeros or decimal point placement when multiplying or dividing by a power of ten with whole number exponents.	use patterns for decimal point placement in the product when multiplying by a power of ten with whole number exponents.	use patterns in the number of zeros in the product when multiplying by a power of ten with whole number exponents.
5.NBT.A.3a 5.NBT.A.3b		read and/or write decimals to thousandths using a variety of decimal notations. Compare multiple decimals using $<$, $>$, $=$.	read and/or write decimals to thousandths using a variety of decimal notations. Compare two decimals using $<$, $>$, $=$.	use place value charts or pictorial representations to read, write, and compare decimals (using $<$, $>$, $=$) with decimals to thousandths.
5.NBT.A.4		use place value understanding to round decimals in any place.	use place value understanding to round decimals in any place using pictorial representations.	use place value understanding to round decimals to the nearest whole number using pictorial representations.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Number and Operations in Base Ten

5.NBT.B: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Evidence Statements:

- **5.NBT.B.5** - Fluently multiply multi-digit whole numbers using the standard algorithm.
- **5.NBT.B.6** - Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
- **5.NBT.B.7** - Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. **5.NBT.B.7-1** Addition, **5.NBT.B.7-2** Subtraction, **5.NBT.B.7-3** Multiplication, **5.NBT.B.7-4** Division.

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5.NBT.B.5	accurately perform operations with multi-digit whole numbers and with decimals to hundredths that require connecting multiple grade-level concepts.	accurately multiply multi-digit whole numbers using the standard algorithm with two-digit by three-digit factors and two-digit by four-digit factors.	accurately multiply multi-digit whole numbers with two-digit by two-digit factors.	accurately multiply multi-digit whole numbers up to three-digit by one-digit factors.
5.NBT.B.6		find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors.	find whole-number quotients of whole numbers with up to three-digit dividends and two-digit divisors.	find whole-number quotients using whole numbers with two-digit dividends and two-digit divisors.
5.NBT.B.7		solve mathematical problems using the four operations with decimals to hundredths.	solve mathematical problems involving the addition and subtraction with decimals to hundredths.	solve mathematical problems involving addition with decimals to hundredths using pictorial representations.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Number and Operations-Fractions

5.NF.A: Use equivalent fractions as a strategy to add and subtract fractions.

Evidence Statements: The standard 5.NF.A.1 is broken down by operations and by types of fractions for assessment purposes.

- **5.NF.A.1-1 - Add fractions** with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- **5.NF.A.1-2 - Subtract fractions** with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators
- **5.NF.A.1-3 - Add mixed numbers** with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- **5.NF.A.1-4 - Subtract mixed numbers** with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- **5.NF.A.2** - Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

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5.NF.A.1-1 5.NF.A.1-2 5.NF.A.1-3 5.NF.A.1-4	add and subtract fractions and mixed numbers to solve problems that require connecting multiple grade-level concepts.	add and subtract fractions and mixed numbers with unlike denominators.	add and subtract fractions, less than one, with unlike denominators.	add and subtract fractions, less than one, with unlike denominators where one denominator is a multiple of the other denominator.
5.NF.A.2		use addition and subtraction to solve word problems with mixed numbers and fractions with unlike denominators.	use addition and subtraction to solve word problems with fractions, less than one, with unlike denominators.	use addition and subtraction to solve word problems with fractions, less than one, with unlike denominators where one denominator is a multiple of the other denominator.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Number and Operations-Fractions

5.NF.B: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Evidence Statements:

- **5. NF.B.3** - Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- **5.NF.B.4a** - Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.
- **5. NF.B.6** - 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.7a** - Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.
- **5. NF.B.7b** - Interpret division of a whole number by a unit fraction and compute such quotients.
- **5. NF.B.7c** - Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.

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5.NF.B.3	apply an understanding of interpreting fractions as multiplying and dividing fractions to solve problems that require connecting multiple grade-level concepts.	solve problems that require interpreting fractions as division.	solve problems that require interpreting fractions as division when provided a visual model.	solve problems that require interpreting fractions as division (quotients are unit fractions).
5.NF.B.4a		interpret the product of a whole number times a fraction or fraction times a fraction.	interpret the product of two unit fractions.	interpret the product of a fraction times a whole number (fractions are not unit fractions).
5.NF.B.6		solve real-world problems involving multiplication of fractions and mixed numbers.	solve real-world problems involving multiplication of mixed numbers by a fraction.	solve real-world problems involving multiplication of mixed numbers by whole numbers.
5.NF.B.7a 5.NF.B.7b 5.NF.B.7c		solve problems and interpret a whole number divided by a unit fraction and a unit fraction divided by a whole number.	solve problems and interpret a whole number (two to five) divided by a unit fraction ($\frac{1}{2}$ or $\frac{1}{4}$) and a unit fraction divided by a whole number.	solve problems involving division of whole numbers (two to five) by a unit fraction ($\frac{1}{2}$ and $\frac{1}{4}$) using visual fraction models and/or equations to represent the problem.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Measurement and Data

5.MD.A: Convert like measurement units within a given measurement system.

Evidence Statement:

- 5.MD.A.1** - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m) and use these conversions in solving multi-step, real-world problems.

Note: There is a MCAP Reference sheet with conversion of basic units for standard measurement. It will be available during the testing session.

Evidence Statement Code	Level 4 <i>A student performing at this level should be able to:</i>	Level 3 <i>A student performing at this level should be able to:</i>	Level 2 <i>A student performing at this level should be able to:</i>	Level 1 <i>A student performing at this level should be able to:</i>
5.MD.A.1	apply an understanding of converting measurement units to solve problems that require connecting multiple grade-level concepts.	solve multi-step problems that involve the conversion of standard measurement units.	solve two-step problems that involve converting a measurement from a smaller unit to a larger unit.	convert measurements from a smaller unit to a larger unit. <i>(For example: 36 inches equals how many feet, 2000 cubic cm equals how many liters)</i>

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Measurement and Data

5.MD.B: Represent and interpret data.

Evidence Statement:

- 5.MD.B.2 - Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.

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5.MD.B.2	apply understanding of the data using a line plot to solve problems that require connecting multiple grade-level concepts.	complete and/or interpret a line plot with a given data set of fractions with different denominators. Use the data from the line plot to solve problems using any of the four operations.	complete and/or interpret a line plot with a given data set; of fractions with like denominators with some tick marks missing labels. Use the data from the line plot to solve problems using any of the four operations.	complete and/or interpret a line plot given a data set of fractions with like denominators with all tick marks labeled. Use the data from the line plot to solve problems using any of the four operations.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Measurement and Data

5.MD.C: Geometric measurement: Understand concepts of volume and relate volume to multiplication and to addition.

Evidence Statements:

- **5.MD.C.5a** - Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent three-fold whole-number products as volumes, e.g., to represent the associative property of multiplication.
- **5.MD.C.5b** - Apply the formulas $V = (l)(w)(h)$ and $V = (B)(h)$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems.
- **5.MD.C.5c** - Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real-world problems.

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5.MD.C.5a 5.MD.C.5b 5.MD.C.5c	apply an understanding of volume for one and two rectangular prisms to solve problems that require connecting multiple grade-level concepts.	apply the formulas $V = (l)(w)(h)$ and $V = (B)(h)$ for rectangular prisms to find volumes of single right rectangular prisms and of two non-overlapping right rectangular prisms.	determine the volume of a right rectangular prism using the formula for volume when provided the three dimensions.	determine the volume of a right rectangular prism filled with unit cubes.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Geometry

5.G.A: Graph points on the coordinate plane to solve real-world and mathematical problems.

Evidence Statements:

- **5.G.A.1** - Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that 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, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
- **5.G.A.2** - Represent real-world mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

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5.G.A.1 5.G.A.2	apply an understanding of graphing points on a coordinate plane to solve problems that require connecting multiple grade-level concepts.	represent real-world problems by creating or identifying ordered pairs and plotting them in the coordinate plane. Interpret values of points in the context of the situation.	plot at least two points on the coordinate plane when given ordered pairs or name at least two points on the coordinate plane.	plot one point on the coordinate plane when given an ordered pair in problems without context.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Domain: Geometry

5.G.B: Classify two-dimensional figures into categories based on their properties.

Evidence Statements:

- **5.G.B.3** - Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
- **5.G.B.4** - Classify two-dimensional figures in a hierarchy based on properties.

Evidence Statement Code	Level 4 <i>A student performing at this level should be able to:</i>	Level 3 <i>A student performing at this level should be able to:</i>	Level 2 <i>A student performing at this level should be able to:</i>	Level 1 <i>A student performing at this level should be able to:</i>
5.G.B.3 5.G.B.4	apply an understanding of the attributes of two-dimensional figures in order to classify two-dimensional figures in a hierarchy of groups. Solve problems that require connecting multiple grade-level concepts.	classify two-dimensional figures in a hierarchy based on properties.	identify two-dimensional figures by their attributes.	identify a two-dimensional figure by appearance.

MCAP Grade 5 Performance Level Descriptors (PLDs)

Reasoning Subclaim

All Reasoning assessment items connect to the content knowledge, skills, and abilities described in the Grade 5 Content Evidence Statements.

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

- one-point items that require the application of reasoning skills aligned to the Content PLDs.
- three-point or four-point items that require communicating their reasoning via a written response.

Evidence Statements:

- **5.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.
- **5.R.2** - Identify flawed thinking/reasoning and explain how to correct the thinking or work.
- **5.R.3** - Prove or disprove a statement, conjecture, or generalization, using correct and precise mathematical examples (visual representations, words, symbols, equations or expressions).
- **5.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.

Reasoning PLDs

The Reasoning PLDs describe a student’s written response to a three-point or four-point reasoning item at each performance level.

Level 4 <i>A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:</i>	Level 3 <i>A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:</i>	Level 2 <i>A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:</i>	Level 1 <i>A student performing at this level should be able to provide evidence of mathematical reasoning by communicating:</i>
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.

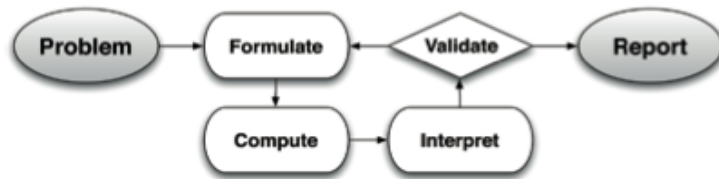
MCAP Grade 5 Performance Level Descriptors (PLDs)

Modeling Subclaim

All Modeling assessment items require a student to employ one or more steps of the modeling cycle when determining a response and are connected to the content knowledge, skills, and abilities described in the Grade 5 Content Evidence Statements.

Students must provide evidence of their ability to use the modeling cycle by responding to one-point machine scored items and three-point or four-point items that require communicating a written response.

Modeling Cycle



Evidence Statements:

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

MCAP Grade 5 Performance Level Descriptors (PLDs)

Modeling PLDs

The Modeling PLDs describe a student’s written response to a three-point or four-point modeling item at each performance level. For one-point modeling items, refer to the content PLD for the associated standard.

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