MCAP Maryland Comprehensive Assessment Program

Algebra I

Performance Level Descriptors

Maryland State Department of Education
August 2021

MARYLAND STATE DEPARTMENT OF EDUCATION
EQUITY AND EXCELLENCE

Content Subclaim

Big Idea #1: Use properties of rational and irrational numbers.

Domain: The Real Number System (N.RN)
Cluster: Use properties of rational and irrational numbers (N.RN.B)
Evidence Statement

- **N.RN.B.3** Apply properties of rational and irrational numbers to identify rational and irrational numbers.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
make **generalizations** about sums and/or products of rational and irrational numbers.	**make a generalization** about sums or products of rational and irrational numbers.	identify rational and/or irrational expressions containing **at least** one arithmetic operation with all terms and factors in numeric form.	identify rational and/or irrational expressions containing **at most** one arithmetic operation with all terms and factors in **simplified** numeric form.

Big Idea #2: Reason quantitatively and use units to solve problems

Domain: Quantities (N.Q)
Cluster: Reason quantitatively and use units to solve problems (N.Q.A)
Evidence Statements

- **N.Q.A.1** Determine an appropriate scale for a graph. Use dimensional analysis to convert units.
- **N.Q.A.2** Select an appropriate quantity for a real-world context.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
determine, use, and **interpret** appropriate quantities or scale to solve problems in a real-world context.	determine and **use** appropriate quantities or scale to **solve problems** in a real-context.	**determine** appropriate quantities or scale in a real-world context.	choose an appropriate quantity or scale in a real-world context.

Big Idea #3: Interpret Representations

Domain: Seeing Structure in Expressions (A.SSE)
Cluster: Interpret the structure of expressions (A.SSE.A)
Evidence Statements

- A.SSE.A.1.a Interpret parts of linear, quadratic or exponential expressions that represent a quantity in terms of real-world context.
- A.SSE.A.1.b Interpret complicated expressions by viewing one or more of their parts as a single entity.

Domain: Interpreting Functions (F.IF.A)
Cluster: Understand the concept of function and use function notation.

- F.IF.A.3 Recognize that sequences are functions, sometimes-defined recursively, whose domain is a subset of the integers.

Cluster: Interpret functions that arise in applications in terms of the real-world context (F.IF.B)
Evidence Statements

- F.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
- F.IF.B.5 Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.
- F.IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Cluster: Analyze functions using different representations (F.IF.C)
Evidence Statement

- F.IF.C.8.a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.

Domain: Linear, Quadratic and Exponential Functions (F.LE)
Cluster: Construct and compare linear, quadratic, and exponential models and solve problems. (F.LE.A)
Evidence Statement

- F.LE.A.1.a Given real-world situations identify those that can be modeled with a linear function versus an exponential function
- F.LE.A.1.b Identify the relationship between two quantities in a given contextual situation where the rate of change over equal intervals is the same.

Cluster: Interpret expressions for functions in terms of the situation they model (F.LE.B)
Evidence Statement

- F.LE.B.5 Interpret the parameters in a linear or exponential function in terms of a context.

Domain: Interpreting Categorical and Quantitative Data (S.ID)
Cluster: Interpret Linear Models (S.ID.C)
Evidence Statement

- S.ID.C.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the real-world context of the data.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
interpret, compare, and/or relate **any course appropriate** functional relationships or expressions in terms of a mathematical or a real-world context.	interpret, **compare, and/or relate** linear, quadratic, or exponential functional relationships or expressions in terms of a mathematical or a real-world context.	interpret linear, **quadratic, or exponential** functional relationships or expressions in terms of a mathematical or a real-world context.	interpret **defined** linear functional relationships or expressions in terms of a mathematical or a real-world context.
identify a given sequence as arithmetic, geometric, or neither **in problems that may require perseverance.**	identify a given sequence as arithmetic, geometric, or **neither**.	identify a given sequence as arithmetic or **geometric.**	identify a given sequence as **arithmetic**.

Big Idea #4: Produce and/or use equivalent forms of algebraic expressions, equations, and functions

Domain: Seeing Structure in Expressions (A.SSE)
Cluster: Interpret the Structure of expressions (A.SSE.A)
Evidence Statement

- A.SSE.A.2 Rewrite linear, quadratic and exponential expressions.

Cluster: Write expressions in equivalent forms to solve problems (A.SSE.B)
Evidence Statement

- A.SSE.B.3.a Factor a quadratic expression to reveal the zeros of the function it defines.
- A.SSE.B.3.b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
- A.SSE.B.3.c Use the properties of exponents to transform expressions for exponential functions.

Domain: Arithmetic with Polynomials and Rational Expressions (A.APR)
Cluster: Perform operations on polynomial (A.APR.A)
Evidence Statement

- A.APR.A.1 Add, subtract, and multiply polynomials.

Cluster: Understand the relationship between zeros and factors of a polynomial (A.APR.B)
Evidence Statement

- A.APR.B.3 Identify zeros of polynomials when suitable factorizations are available and/or use the zeros to construct a rough graph of the function defined by the polynomial.

Cluster: Solve equations and inequalities on one variable (A.REI.B)
Evidence Statement

- A.REI.B.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions.

Domain: Interpreting Functions (F.IF)
Cluster: Understand the concept of function and use function notation.

- F.IF.A.3 Recognize that sequences are functions, sometimes-defined recursively, whose domain is a subset of the integers.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
use the structure of expressions and equations to rewrite them in different forms in order to **make generalizations and draw conclusions**.	use the structure of expressions and equations to rewrite them in different forms **and/or use the equivalent form to determine needed information**.	use the structure of simple expressions and equations to identify or produce equivalent forms in situations involving **more than two** operations.	use the structure of simple expressions and equations to identify or produce equivalent forms in situations involving **no more than two operations.**

Big Idea #5: Create a symbolic representation to represent the relationship between quantities.

Domain: Creating Equations (A.CED)
Cluster: Create equations that describe the numbers or relationships (A.CED.A)
Evidence Statements

- A.CED.A.1 Create equations and inequalities in **one** variable and use them to solve problems. Include equations arising from **linear and quadratic** functions, and simple rational and **exponentia**l functions.
- A.CED.A.2 Create equations and inequalities in **two or more** variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.

Domain: Interpreting Functions (F.IF)
Cluster: Understand the concept of function and use function notation. (F.IF.A)

- F.IF.A.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers

Domain: Building Functions (F.BF)
Cluster: Build a function that models a relationship between two quantities.(F.BF.A)
Evidence Statement

- F.BF.A.1a Write a function based on an observed pattern in a real-world scenario.

Domain: Linear, Quadratic and Exponential Functions (F.LE)
Cluster: Construct and compare linear, quadratic, and exponential models and solve problems (F.LE.A)
Evidence Statement

- F.LE.A.2 Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear, or exponential function models, where exponentials are limited to integer exponents.

Domain: Interpreting Categorical and Quantitative Data (S.ID)
Cluster: Summarize, represent, and interpret data on two categorical and quantitative variables. (S.ID.B)
Evidence Statements

- S.ID.B.6a Fit a function to the data; use functions fitted to data to solve problems in the real-world context of the data. Use given functions or choose a function suggested by the real-world context. Emphasize linear, quadratic, and exponential models.
- S.ID.B.6c Fit a linear function for a scatter plot that suggests a linear association**.**

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
create or choose mathematical representations that model relationships between quantities **relating multiple grade-level concepts** and when prompted use the representation to make further decisions about mathematical and real-world problems.	**create** or choose a mathematical representation to model a relationship between quantities and **when prompted use the representation to make further decisions about mathematical and real-world problems.**	choose a representation that models a linear or an **exponential** relationship between quantities.	choose a representation that models a **linear** relationship between quantities.
create or choose the explicit rule for a given arithmetic or geometric sequence in problems **relating multiple grade-level concepts.**	**create** or choose the explicit rule for a given arithmetic or geometric sequence.	choose the explicit rule for a given arithmetic or **geometric** sequence.	choose the explicit rule for a given arithmetic sequence.

Big Idea #6: Solve and understand solutions of given equations, inequalities, systems of equations and systems of inequalities.

Domain: Reasoning with Equations and Inequalities (A.REI)
Cluster: Understand solving equations as a process of reasoning and explain the reasoning. (A.REI.A)
Evidence Statement

- A.REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Cluster: Solve equations and inequalities on one variable (A.REI.B)
Evidence Statements

- A.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A.REI.B.4 Solve quadratic equations in one variable.

Cluster: Solve systems of equations (A.REI.C)
Evidence Statement

- A.REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Cluster: Represent and solve equations and inequalities graphically (A.REI.D)
Evidence Statements

- A.REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve
- A.REI.D.11 Approximate the solutions to an equation of the form $f(x) = g(x)$ using the point(s) of intersection of the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect.
- A.REI.D.12 Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Domain: Creating Equations (A.CED)
Cluster: Create equations that describe numbers or relationships (A.CED.A)
Evidence Statement

- A.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
- A.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
solve equations, inequalities, and systems of equations/inequalities, including literal equations, that require the use of a combination of procedures, or require perseverance. communicate the reasoning used to determine a solution. represent the solution to a linear inequality in two variables, and to systems of linear inequalities graphically. **interpret solutions to equations, inequalities, and systems of equations or inequalities as viable or nonviable in a modeling context.**	solve equations, inequalities, and systems of equations **including literal equations.** **communicate** the reasoning used to determine a solution. **represent** the solution to a linear inequality in two variables, and to **systems of linear inequalities** graphically.	solve **quadratic** equations by factoring where the leading coefficient equals 1 and b and c are integers, by taking square roots, the quadratic formula, or graphing and solve linear equations, inequalities, and systems of equations. **identify the reasoning for a step in the solution process.** **identify the graphic representation of the solutions to a linear inequality or a system of linear inequalities in two variables**.	solve **linear** equations, inequalities, and systems of equations that entail little procedural demand.

Big Idea #7: Understand, Compare and Use Properties of Functional Relationships

Domain: Interpreting Functions (F.IF)
Cluster: Understand the concept of a function and use function notation. (F.IF.A)
Evidence Statement

- F-IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then $f(x)$ denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation $y = f(x)$.
- F.IF.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context.
- F.IF.A.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

Cluster: Interpret functions that arise in applications in terms of real-world context (F.IF.B)
Evidence Statement

- F.IF.B.5 Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.
- F.IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate rate of change from graph.

Cluster: Analyze functions using different representations. (F.IF.C)
Evidence Statement

- F.IF.C.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
determine the domain and/or range of a function representing a real-world context in problems **relating multiple grade-level concepts**.	determine the domain and/or range of a function **representing a real-world context.**	determine the domain and range of a linear, quadratic, or exponential function given in numeric, **graphic**, or **algebraic** form.	identify the domain and range of a function given in **numeric form**.
determine if a relation is a function in problems **that require the use of a complex line of reasoning.**	determine if a relation given in numeric, **algebraic** or graphic form is a function.	determine if a relation given in **numeric** or graphic form is a function.	determine if a relation given **in graphic form** is a function.
use, evaluate, and interpret functions for inputs in their domain that **require a complex line of reasoning**.	use, evaluate, and **interpret** functions for inputs in their domain in terms of real-world context.	**use and** evaluate functions for inputs in their domain.	evaluate functions for inputs in their domain.
use a recursive or explicit rule for a function or sequence to determine the value of a specified term or determine which term has a specified value **in problems relating multiple grade-level concepts.**	use a **recursive** or explicit rule for an arithmetic **or geometric** sequence to determine the value of a specified term or determine which term has a specified value**.**	use an explicit rule for an arithmetic sequence to determine the value of a specified term or **determine which term has a specified value**.	use an explicit rule for a sequence to determine the value of a specified term.
calculate/estimate the average rate of change of a function from an algebraic, numeric, or graphic representation; interpret the average rate of change in terms of real world context and/or **compare rates of change over multiple intervals**.	calculate/**estimate** the average rate of change of a function from an algebraic, numeric, or graphic representation and/or **interpret the average rate of change in terms of real world context**.	calculate the average rate of change of a function from an **algebraic,** numeric**, or graphic** representation.	calculate the average rate of change of a function from the **numeric** representation.
compare properties of **any two course appropriate functions** each represented in different forms (algebraic, numeric, graphic or verbal) **in problems requiring perseverance and/or relating multiple grade-level concepts.**	compare properties of any two functions (linear, **quadratic, or exponential)** each represented in different forms (algebraic, numeric, graphic or **verbal**).	compare properties of two **linear** functions given in algebraic, numeric, or graphic forms.	

Big Idea #8: Graph Functions and/or Analyze/Interpret Graphs

Domain: Interpreting Functions (F.IF)
Cluster: Interpret functions that arise in applications in terms of real-world context. (F.IF.B)
Evidence Statement

- F.IF.B.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship

Cluster: Analyze functions using different representations (F.IF.C)
Evidence Statements:

- F.IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases
- F.IF.C.8a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.

Domain: Building Functions (F.BF)
Cluster: Build new functions from existing functions. (F.BF.B)
Evidence Statement

- F.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x)+k; f(x+k); f(kx);$ and $kf(x)$ for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
graph or identify the graph of **any course appropriate function** and analyze the graph.	graph or identify the graph of linear, quadratic, exponential, **square root, and absolute value functions and analyze the graph.**	graph or identify the graph of a linear, **exponential**, or **quadratic** functions.	graph or identify the graph of a **linear** function.
interpret the key features, in terms of a mathematical or a real-world context, of **course appropriate** functions.	interpret the key features, in terms of a mathematical or a real-world context, of linear, quadratic, or exponential functions**.**	interpret the key features, in terms of a mathematical or a real-world context, of linear, **quadratic, or exponential functions,** when given the graph.	interpret the key features, in terms of a mathematical or a real-world context, of **linear** functions **when given the graph.**
select, produce, **and/or** analyze the graph of a function under one or more transformations**.**	select, produce, or analyze the graph of a function **under one or more transformations**.	select the graph of a functions under a vertical and/or a **horizontal** translation.	select the graph of a function under a **vertical** translation.

Big Idea #9: Analyze Connections between Data Sets or Real-World Scenarios and Functional Relationships

Domain: Linear, Quadratic and Exponential Functions (F.LE)
Cluster: Construct and compare linear, quadratic, and exponential models and solve problems (F.LE.1)
Evidence Statement

- F.LE.A.1.a Given real-world situations identify those that can be modeled with a linear function versus an exponential function.

Domain: Interpreting Categorical and Quantitative Data
Cluster: Summarize, represent and interpret data on two categorical and quantitative variables. (S.ID.B)
Evidence Statement

- S.ID.B.6a Fit a function to the data; use functions fitted to data to solve problems in the real-world context of the data. Use given functions or choose a function suggested by the real-world context. Emphasize linear, quadratic, and exponential models.
- S.ID.B.6b Informally assess the fit of a function by plotting and analyzing residuals

Cluster: Interpret Linear Models (S.ID.C)
Evidence Statement

- S.ID.C.8 Compute (using technology) and interpret the correlation coefficient of a linear fit
- S.ID.C.9 Distinguish between correlation and causation.

Level 4 *A student performing at this level should be able to:*	**Level 3** *A student performing at this level should be able to:*	**Level 2** *A student performing at this level should be able to:*	**Level 1** *A student performing at this level should be able to:*
analyze a real-world scenario or data set **and provide an argument as to why it could be represented** by a linear, quadratic, or exponential function. determine how well a linear function represents a data set by **computing** and/or analyzing residuals and/or interpreting the correlation coefficient. distinguish between correlation and causation **in problems that require the use of analysis, judgement or creative thought.**	analyze a real-world scenario **and/or** a data set to determine whether it could be represented by a linear, **quadratic,** or exponential function. determine how well a linear function represents a data set by **analyzing residuals** and/or interpreting the correlation coefficient. distinguish between correlation and causation.	analyze a real-world scenario presented with a data set to determine whether it could be represented by a linear or **exponential function**. determine the difference between the actual and predicted values from the best-fit equation. determine how well a linear function represents a data set, given a correlation coefficient and a graph.	analyze a real-world scenario presented with a data set, to determine whether it could be represented by a linear function.

Reasoning Subclaim

All Reasoning Assessment Items connect to the content knowledge, skills, and abilities described in the Algebra I 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.
- four-point items that require communicating their reasoning via a written response.

MCAP Algebra I Reasoning Evidence Statements

Code	Evidence Statement
A1.R.1	Given an equation reason about the number and/or nature of the solutions.
A1.R.2	Given a system of equations reason about the number or nature of the solutions.
A1.R.3	Reasoning based on the principle that the graph of an equation and inequality in two variables is the set of all its solutions plotted in the coordinate plane.
A1.R.4	Identify an option that would refute a conjecture/claim.
A1.R.5	Identify a correct method and justification given two or more chains of reasoning.
A1.R.6	Given a proposition, determine cases where the proposition is true or false.
A1.R.7	Identify an unstated assumption that would make a problem well posed or make a particular method viable.
A1.R.8	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any).
A1.R.9	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions.
A1.R.10	Express reasoning about transformations of functions.
A1.R.11	Express reasoning about linear and exponential growth.

MCAP Algebra I Reasoning PLDs

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

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

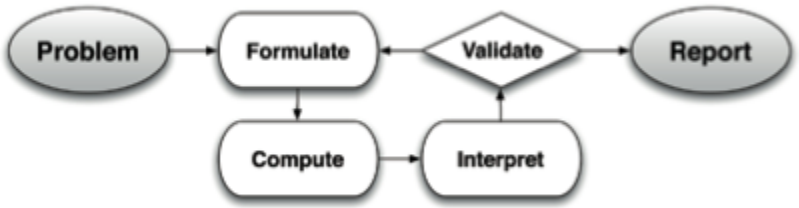
Modeling Subclaim

Performance Level Descriptors (PLDs)

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 Algebra I Content Evidence Statements.

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

Modeling Cycle



Stage of the Modeling Cycle	Student Actions during this stage	Evidence Statement
Formulate	Make assumptions Define variables Create a mathematical model	A1.M.2 A1.M.7 A1.M.8
Compute	Perform procedures using a formulated or given model	Including within A1.M.6
Interpret	Relate the results of the compute stage to the real-world situation.	A1.M.4 A1.M.5
Validate	Test the reasonableness of answers in terms of the real-world situation.	A1.M.1 A1.M.3

MCAP Algebra I Modeling Evidence Statements

Code	Modeling Evidence Statement
A1.M.1	Choose between competing mathematical models to solve real-world problems.
A1.M.2	Construct a mathematical model to solve a problem.
A1.M.3	Validate a given model and make improvement.
A1.M.4	Interpret the solution to a real-world problem in terms of context.
A1.M.5	Compare the result from a model with real world data.
A1.M.6	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.
A1.M.7	Identify information or assumptions needed to solve a problem.
A1.M.8	Provide a reasoned estimate of a quantity needed to solve a problem.

MCAP Algebra I Modeling PLDs

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

Level 4 *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 3** *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 2** *A student performing at this level should be able to provide evidence of the ability to use the modeling cycle by:*	**Level 1** *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.

Cross-reference sheet between Big Ideas and Algebra I Evidence Statements

Evidence Statement Code	Big Idea #1
N-RN.B.3	1
N-Q.A.1	2
N-Q.A.2	2
N-Q.A.3	Not assessed
A.SSE.A.1.a	3
A.SSE.A.1.b	3
A.SSE.A.2	4
A-SSE.B.3a	4
A-SSE.B.3b	4
A-SSE.B.3c	4
A-APR.A.1	4
A-APR.B.3	4
A-CED.A.1	5
A-CED.A.2	5
A-CED.A.3	5 &6
A-CED.A.4	6
A.REI.A.1	6
A-REI.B.3-1	6
A-REI.B.4a	4
A-REI.B.4b	6
A-REI.C.6	6
A-REI.D.10	6
A-REI.D.11	6

Evidence Statement Code	Big Idea #1
A-REI.D.12	6
F-IF.A.1	7
F-IF.A.2	7
F-IF.A.3	3,4,5 & 7
F-IF.B.4	3 & 8
F-IF.B.5	3 & 7
F-IF.B.6-1	3 & 7
F-IF.C.7-1.a	8
F-IF.C.7b	8
F-IF.C.8a	3 & 8
F-IF.C.9	7
F.BF.A.1-1.a	5
F-BF.B.3	8
F-LE.A.1a	3 & 9
F-LE.A.2	5
F-LE.A.3	Not assessed
F-LE.B.5-1	3
S-ID.B.6.a	5 & 9
S-ID.B.6b	9
S-ID.B.6c	5
S-ID.C.7	3
S-ID.C.8	9
S-ID.C.9	9