Evidence Statement Tables

Mathematics I

Evidence Statement Keys

Evidence statements describe the knowledge and skills that an assessment item/task elicits from students. These are derived directly from the Common Core State Standards for Mathematics (the standards), and they highlight the advances of the standards, especially around their focused coherent nature. The evidence statement keys for grades 3 through 8 will begin with the grade number. High school evidence statement keys will begin with "HS" or with the label for a conceptual category. Together, the five different types of evidence statements described below provide the foundation for ensuring that the assessment of full range and depth of the standards can be downloaded from http://www.corestandards.org/Math/.

An Evidence Statement might:

1. **Use exact standard language** – For example:

   - 8.EE.1 - Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. This example uses the exact language as standard 8.EE.1

2. **Be derived by focusing on specific parts of a standard** – For example: 8.F.5-1 and 8.F.5-2 were derived from splitting standard 8.F.5:

   - 8.F.5-1 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear).
   - 8.F.5-2 Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

   Together these two evidence statements are standard 8.F.5:

   Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or 2 decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

3. **Be integrative (Int) –** Integrative evidence statements allow for the testing of more than one of the standards on a single item/task without going beyond the standards to create new requirements. An integrative evidence statement might be integrated across all content within a grade/course, all standards in a high school conceptual category, all standards in a domain, or all standards in a cluster. For example:

   - **Grade/Course – 4.Int.2**[§] (Integrated across Grade 4)
   - **Conceptual Category – F.Int.1**[§] (Integrated across the Functions Conceptual Category)
   - **Domain – 4.NBT.Int.1**[§] (Integrated across the Number and Operations in Base Ten Domain)
   - **Cluster** – **3.NF.A.Int.1**[§] (Integrated across the Number and Operations – Fractions Domain, Cluster A)

4. **Focus on mathematical reasoning–** A reasoning evidence statement (keyed with C) will state the type of reasoning that an item/task will require and the content scope from the standard that the item/task will require the student to reason about. For example:

- 3.C.2[§] -- Base explanations/reasoning on the relationship between addition and subtraction or the relationship between multiplication and division.
  - Content Scope: Knowledge and skills are articulated in 3.OA.6
- 7.C.6.1[§] – Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures.
  - Content Scope: Knowledge and skills are articulated in 7.RP.2

  Note: When the focus of the evidence statement is on reasoning, the evidence statement may also require the student to reason about securely held knowledge from a previous grade.

5. **Focus on mathematical modeling –** A modeling evidence statement (keyed with D) will state the type of modeling that an item/task will require and the content scope from the standard that the item/task will require the student to model about. For example:

- 4.D.2[§] – Solve multi-step contextual problems with degree of difficulty appropriate to Grade 4 requiring application of knowledge and skills articulated in 3.OA.A, 3.OA.8,3.NBT, and/or 3.MD.

  Note: The example 4.D.2 is of an evidence statement in which an item/task aligned to the evidence statement will require the student to model on grade level, using securely held knowledge from a previous grade.

- HS.D.5[§] – Given an equation or system of equations, reason about the number or nature of the solutions.
  - Content scope: A-REI.11, involving any of the function types measured in the standards.

[§] The numbers at the end of the integrated, modeling and reasoning Evidence Statement keys are added for assessment clarification and tracking purposes. For example, 4.Int.2 is the second integrated Evidence Statement in Grade 4.

Mathematics I Evidence Statements
Listing by Type I, Type II, and Type III

The Evidence Statements for Mathematics I are provided starting on the next page. The list has been organized to indicate whether items designed are aligned to an Evidence Statement used for Type I items, Type II items (reasoning), or Type III items (modeling).

Evidence Statements are presented in the order shown below and are color coded:

Peach – Evidence Statement is applicable to Type I items.

Lavender – Evidence Statement is applicable to Type II items.

Aqua – Evidence Statement is applicable to Type III items.

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
A	A-CED.3-1	Solve multi-step contextual problems that require writing and analyzing systems of linear inequalities in two variables to find viable solutions.	i) Tasks are less defined and require students to engage in the modeling cycle. ii) Scaffolding in tasks may range from substantial to very little or none.	MP.1, MP.2, MP.4	X
A	A-CED.4-1	Rearrange linear formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*	i) Tasks have a real-world context. ii) The quantity of interest is linear in nature.	MP.2, MP.6, MP.7	Z
A	A-REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	i) Tasks do not include absolute value equations or compound inequalities.	MP.7	X
B	A-REI.6-1	Solve multi-step contextual problems that require writing and analyzing systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	i) Tasks are less defined and require students to engage in the modeling cycle. ii) Scaffolding in tasks may range from substantial to very little or none.	MP.1, MP.2, MP.4	X
B	A-REI.6-2	Solve algebraically a system of three linear equations in three unknowns.	i) Coefficients are rational numbers. ii) Tasks do not require any specific method to be used (e.g., prompts do not direct the student to use elimination or any other particular method).	MP.1, MP.7	X
A	A-REI.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 (which could be a line).	-	MP.7	X
A	A-REI.11-1	Find the solutions of where the graphs of the equations *y*= *f(x)* and *y*= *g(x)* intersect, e.g. using technology to graph the functions, make tables of values or find successive approximations. Limit *f(x)* and/or *g(x)* to linear and quadratic functions.★	-	MP.1, MP.5	Y
A	A-REI.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.	-	MP.1, MP.5, MP.6	N

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
A	A-SSE.1-1	Interpret exponential expressions, including related numerical expressions that represent a quantity in terms of its context.★ a) Interpret parts of an expression, such as terms, factors, and coefficients. b) Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of *P* and a factor not depending on *P*.	i) See illustrations for A-SSE.1 at http://illustrativemathematics.org, e.g., http://illustrativemathematics.org/illustrations/390	MP.7	Z
B	A-SSE.3c-1	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression, where exponentials are limited to integer exponents. ★ c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as ((1.151/12)12)^t ≈ 1.01212^t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	i) Tasks have a real-world context. ii) The equivalent form must reveal something about the real-world context. iii) Tasks require students to make the connection between the equivalent forms of the expression.	MP.1, MP.2, MP.4, MP.7	X
Ψ	F-Int.1-3	Given a verbal description of a linear functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function.	i) Given a verbal description of a functional dependence, the student would be required to write an expression for the function and then, - e.g., identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value. - e.g., a functional dependence might be described as follows: "The slope of the line passing through the points (1, 3) and (7, y) is a function of y." The student would be asked to create an expression such as s(y) = (3-y)/(1-7) for this function. The natural domain for this function would be the real numbers. The function is increasing and linear. And so on.	MP.1, MP.2, MP.8	X
A	F-BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. ★	i) More substantial work along these lines occurs in Sub-Claim D.	MP.7, MP.8	X
A	F-IF.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)*.	-	MP.2	Z

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
A	F-IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	i) See illustrations for F-IF.2 at http://illustrativemathematics.org.	MP.6, MP.7	X
A	F-IF.A.Int.1	Understand the concept of a function and use function notation	i) Tasks require students to use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context. ii) About a quarter of tasks involve functions defined recursively on a domain in the integers.	MP.2	X
A	F-IF.4-3	For a linear 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. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums end behavior; and symmetries.★	i) See illustrations for F-IF.4 at http://illustrativemathematics.org	MP.4, MP.6	X
A	F-IF.5-1	Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes, limiting to linear functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute-value functions) , and exponential functions with domains in the integers. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for this function.★	i) Tasks have a real-world context.	MP.2	Z
A	F-IF.6-3a	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear functions.★	i) Tasks have a real-world context. ii) Tasks must include the interpret part of the evidence statement.	MP.1, MP.4, MP.5, MP.7	X

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
A	F-IF.6-3b	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear, square root, cube root, piecewise-defined (including step and absolute value functions) and exponential functions with domains in the integers.★	i) Tasks have a real-world context ii) Tasks must include the interpret part of the evidence statement. iii) The rate of change should be limited to regions of the function that are linear or near linear.	MP.1, MP.4, MP.5, MP.7	X
A	F-IF.6-8	Estimate the rate of change from a graph of linear functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and/or exponential functions with domains in the integers.★	i) Tasks have a real-world context.	MP.1, MP.4, MP.5,	X
B	F-IF.7a-1	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ a) Graph linear functions and show intercepts.	-	MP.1, MP.5, MP.6	X
B	F-IF.9-3	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Function types are limited to linear functions, square root functions, cube root functions, piecewise- defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.	i) Tasks may or may not have a real-world context.	MP.1, MP.2, MP.3, MP.5, MP.6,	X
B	F-LE.2-1	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	i) Tasks are limited to constructing linear and exponential functions with domains in the integers, in simple real-world context.	MP.1, MP.2, MP.5	X
B	F-LE.2-2	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear and/or exponential function models, where exponentials are limited to integer exponents.★	i) Prompts describe a scenario using everyday language. Mathematical language such as "function," "exponential," etc. is not used. ii) Students autonomously choose and apply appropriate mathematical techniques without prompting. For example, in a situation of doubling, they apply techniques of exponential functions. iii) For some illustrations, see tasks at http://illustrativemathematics.org under F-LE.	MP.1, MP.2, MP.4, MP.6	X

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
B	F-LE.2-3	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing linear and/or exponential function models.	i) Prompts describe a scenario using everyday language. Mathematical language such as "function," "exponential," etc. is not used. ii) Students autonomously choose and apply appropriate mathematical techniques without prompting. For example, in a situation of doubling, they apply techniques of exponential functions. iii) For some illustrations, see tasks at http://illustrativemathematics.org under F-LE.	MP.1, MP.2, MP.4, MP.6	X
B	G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	i) Definitions are limited to those in the evidence statement ii) Plane is also considered an undefined notion	MP.6	Z
B	G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	-	MP.5, MP.6, MP.7	Z
B	G-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	-	MP.5, MP.6, MP.7	Z
A	G-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	-	MP.3	Z
A	G-CO.C	Prove geometric theorems as detailed in G-CO.C.	i) Most tasks align to G.CO.9 or G.CO.10. ii) Theorems include but are not limited to the examples listed in standards G-CO.C iii) Multiple types of proofs are allowed (e.g., two-column proof, indirect proof, paragraph proof, and flow diagrams).	MP.3, MP.6	Z
B	S-ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	i) Tasks must have at least one of the categorical variables with more than two sub-categories. ii) "Total" rows and columns will be provided but may be missing the data. iii) Associations should be investigated based on relative frequencies, not counts.	MP.1, MP.5, MP.7	Y

Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MP	Calculator*
Ψ	S-ID.Int.1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in S-ID, excluding normal distributions and limiting function fitting to linear functions and exponential functions with domains in the integers.	i) Tasks should go beyond 6.SP.4 ii) For tasks that use bivariate data, limit the use of time series. Instead use data that may have variation in the y-values for given x-values, such as pre and post test scores, height and weight, etc. iii) Predictions should not extrapolate far beyond the set of data provided. iv) Line of best fit is always based on the equation of the least squares regression line either provided or calculated through the use of technology. v) To investigate associations, students may be asked to evaluate scatterplots that may be provided or created using technology. Evaluation includes shape, direction, strength, presence of outliers, and gaps. vi) Analysis of residuals may include the identification of a pattern in a residual plot as an indication of a poor fit. vii) Exponential models may assess rate of growth, intercepts, etc.	MP.1, MP.2, MP.4, MP.5, MP.6	Y
B	HS-Int.3-1	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-LE, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.★	i) F-LE.A, Construct and compare linear, quadratic, and exponential models and solve problems, is the primary content and at least one of the other listed content elements will be involved in tasks as well.	MP.2 MP.4	Y

★ Modeling standards appear throughout the CCSSM. Evidence statements addressing these modeling standards are indicated by a star symbol (★)

Ψ These integrated evidence statements will be reported in the Master Claim which is used to determine if a student is college or career ready.

*Calculator Key

Y – Yes; Assessed on Calculator Sections
N – No; Assessed on Non-Calculator Sections
X – Calculator is Specific to Item
Z – Calculator Neutral (Could Be on Calculator or Non-Calculator Sections)

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C	HS.C.5.6	Given a system of equations, reason about the number or nature of the solutions. Content Scope: A-REI.5	-	MP.3	Y
C	HS.C.5.10-2	Given an equation or system of equations, reason about the number or nature of the solutions. Content Scope: A-REI.11, limited to equations of the form f(x) = g(x) where f and g are linear.	-	MP.3	Y
C	HS.C.6.1	Base explanations/reasoning on the principle that the graph of equations and inequalities in two variables is the set of all its solutions plotted in the coordinate plane. Content Scope: A-REI.D, excluding exponential and logarithmic functions.	-	MP.3	Y
C	HS.C.10.1	Express reasoning about linear and exponential growth. Content Scope: F-LE.1a	-	MP.3	Y
C	HS.C.14.1	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content Scope: G-CO.9, G-CO.10	i) Theorems include but are not limited to the examples listed in standards G-CO.9 & G-CO.10.	MP.3	Y
C	HS.C.14.2	Construct, autonomously, chains of reasoning that will justify or refute geometric propositions or conjectures. Content Scope: G-CO.A, G-CO.B	-	MP.3	Y
C	HS.C.18.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about linear equations in one or two variables. Content Scope: 8.EE.B	i) For both Algebra 1 and Math 1, we are revisiting content initially introduced in grade 8, from a more mature reasoning perspective.	MP.3, MP.6	Y

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Sub-Claim	Evidence Statement Key	Evidence Statement Tex	Clarifications, limits, emphases, and other information intended to ensure appropriate variety in tasks	Relationship to MPs	Calculator*
D	HS.D.1-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course, requiring application of knowledge and skills articulated in 7.RP.A, 7.NS.3, 7.EE, and/or 8.EE.	-	MP 4, may involve MP.1, MP.2, MP.5	Y
D	HS.D.2-5	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-1, limited to linear equations and exponential equations with integer exponents.	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	MP.2, MP.4	Y
D	HS.D.2-8	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.	i) F-BF.1a is the primary content; other listed content elements may be involved in tasks as well.	MP.2, MP.4	Y
D	HS.D.3-1b	Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature). Content Scope: Knowledge and skills articulated in Mathematics I Type I, Sub-Claim A Evidence Statements.	-	MP 4, may involve MP.1, MP.2, MP.5, MP.7	Y
D	HS.D.3-3b	Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity. Content Scope: Knowledge and skills articulated in Mathematics I Type I, Sub-Claim A Evidence Statements.	-	MP 4, may involve MP.1, MP.2, MP.5, MP.7	Y

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