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**Access**

**Mathematics for Liberal Arts**

**(#7912070)**

**Course Standards**

[MA.912.AR.2.5:](https://www.cpalms.org/PreviewStandard/Preview/15569) Solve and graph mathematical and real-world problems that are modeled with linear functions. Interpret key features and determine constraints in terms of the context.

**Clarifications:**

*Clarification 1*: Key features are limited to domain, range, intercepts and rate of change.

*Clarification 2*: Instruction includes the use of standard form, slope-intercept form and point-slope form.

*Clarification 3*: Instruction includes representing the domain, range and constraints with inequality notation, interval notation or set-builder notation.

*Clarification 4*: Within the Algebra 1 course, notations for domain, range and constraints are limited to inequality and set-builder.

*Clarification 5*: Within the Mathematics for Data and Financial Literacy course, problem types focus on money and business.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.912.AR.2.AP.5:](https://www.cpalms.org/PreviewAccessPoint/Preview/18292) | Given a mathematical and/or real-world problem that is modeled with linear functions, solve the mathematical problem, or select the graph using key features (in terms of context) that represents this model. |  |  |  |
| EssentialUnderstandings | * Understand the following related vocabulary: *x*-axis, *y*-axis, labels, scales, domain, linear function, y-intercept (b), slope (m), graph, add (+), subtract (-), multiply (x), divide ($÷$), equal (=), linear, variable
* Understand key features of a linear function (can include domain, range, y-intercept, or slope)
* Understand that if the slope is positive, the line on the graph rises upward from left to right
* Understand that if the slope is negative the line on the graph will fall downward from left to right
* Understand that if the slope is zero, the line on the graph is horizontal
* Understand that if the slope is undefined, the line on the graph is vertical
* Understand the slope is the rise over the run
* Understand the y-intercept is where the line crosses the y-axis
* Understand that the domain is all the x-values
* Understand that the range is all the y-values
* Understand the slope (rate of change) and y-intercept (if the equation is in y-intercept form, $y=mx+b, $the constant (b) is where the line crosses the y-axis) from a real-world problem
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| Resources: |  |  |  |  |

[MA.912.AR.5.3:](https://www.cpalms.org//PreviewStandard/Preview/15363) Given a mathematical or real-world context, classify an exponential function as representing growth or decay.

**Clarifications:**
*Clarification 1:*Within the Algebra 1 course, exponential functions are limited to the forms , where *b* is a whole number greater than 1 or a unit fraction, or , where .

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.AR.5.AP.3:](https://www.cpalms.org/PreviewAccessPoint/Preview/18311) | Given a real-world context, identify an exponential function as representing growth or decay. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: *x*-axis, *y*-axis, increase, decrease, left, right, growth, decay, exponential function, exponential
* Understand that an exponential function that represents growth will quickly increase from left to right
* Understand that an exponential function that represents decay will quickly decrease from left to right
* Understand that growth can be represented by a pandemic, rabbits, mice, fleas, population, etc.
* Understand that decay can be represented by radioactive materials, population, something that cools (coffee, soup), etc.
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| Resources: |  |  |  |  |

[MA.912.AR.5.4:](https://www.cpalms.org//PreviewStandard/Preview/15589) Write an exponential function to represent a relationship between two quantities from a graph, a written description or a table of values within a mathematical or real-world context.

**Clarifications:**

*Clarification 1:* Within the Algebra 1 course, exponential functions are limited to the forms , where *b* is a whole number greater than 1 or a unit fraction, or , where .

*Clarification 2:* Within the Algebra 1 course, tables are limited to having successive nonnegative integer inputs so that the function may be determined by finding ratios between successive outputs.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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|  [MA.912.AR.5.AP.4:](https://www.cpalms.org/PreviewAccessPoint/Preview/18312) | Select an exponential function to represent two quantities from a graph or a table of values. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: *x*-axis, *y*-axis, *x*-value, *y*-value, left, right, increase, exponential function, exponential, table, graph, constant, common ratio, initial value, definable point, consecutive
* Understand when given a table of an exponential function the *x*-values will increase by a constant value and the *y*-values will increase by a common ratio
* Understand when given the exponential equation $y=ab^{x}$ the variable *a* represents the initial value and the variable *b* represents the ratio between the *y*-values ($a\ne 0,b\ne 1,and b>0)$
* Understand when a graph of the exponential function crosses the *y*-axis at a definable point the *y*-intercept is the initial value
* Understand when given a graph, to calculate the value for the variable b select two consecutive definable points and calculate the ratio between the *y*-values
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| Resources: |  |  |  |  |

[MA.912.AR.5.5:](https://www.cpalms.org//PreviewStandard/Preview/15590) Given an expression or equation representing an exponential function, reveal the constant percent rate of change per unit interval using the properties of exponents. Interpret the constant percent rate of change in terms of a real-world context.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.AR.5.AP.5:](https://www.cpalms.org/PreviewAccessPoint/Preview/18313) | Given an expression or equation representing an exponential function, reveal the constant percent rate of change per unit interval using the properties of exponents. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: algebraic expression, exponents, variable, base number, integers, growth, decay, constant percent change, initial value, properties of exponents
* Understand how to identify the parts of an algebraic expression

E.g., x7 where x is the base number and 7 is the exponent* Understand how to identify expressions with exponents

E.g., (x⁴)(x³)* Understand and use the properties of exponents to simplify algebraic expressions
* Understand the following formula: $f\left(x\right)=ab^{x}$ (a = initial value, b = the growth or decay factor, x = constant percentage change)
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| Resources: |  |  |  |  |

[MA.912.AR.5.6:](https://www.cpalms.org//PreviewStandard/Preview/15591) Given a table, equation or written description of an exponential function, graph that function and determine its key features.

**Clarifications:**
*Clarification 1:* Key features are limited to domain; range; intercepts; intervals where the function is increasing, decreasing, positive or negative; constant percent rate of change; end behavior and asymptotes.

*Clarification 2:* Instruction includes representing the domain and range with inequality notation, interval notation or set-builder notation.

*Clarification 3:* Within the Algebra 1 course, notations for domain and range are limited to inequality and set-builder.

*Clarification 4:* Within the Algebra 1 course, exponential functions are limited to the forms , where *b* is a whole number greater than 1 or a unit fraction or , where .

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.AR.5.AP.6:](https://www.cpalms.org/PreviewAccessPoint/Preview/18314) | Given a table, equation or written description of an exponential function, select the graph that represents the function. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: *x*-axis, *y*-axis, *x*-value, *y*-value, left, right, increase, decrease, growth, decay, exponential function, exponential, table, standard form, graph, constant, common ratio, initial value, definable point, consecutive
* Understand that an exponential function that represents growth will quickly increase from left to right
* Understand that an exponential function that represents decay will quickly decrease from left to right
* Understand that growth can be represented by a pandemic, rabbits, mice, fleas, population, etc.
* Understand that decay can be represented by radioactive materials, population, something that cools (coffee, soup), etc.
* Understand when given a table of an exponential function the *x*-values will increase by a constant value and the *y*-values will increase by a common ratio
* Understand when given the exponential equation $y=ab^{x}$ the variable *a* represents the initial value and the variable *b* represents the ratio between the *y*-values ($a\ne 0,b\ne 1,and b>0)$
* Understand when a graph of the exponential function crosses the *y*-axis at a definable point the *y*-intercept is the initial value variable *a*
* Understand when given a graph, to calculate the value for the variable b select two consecutive definable points and calculate the ratio between the *y*-values
* Understand that the standard form of an exponential function that represents growth is $y=a(1+r)^{x}$ where a is the initial value (a > 0), r is the rate of growth (r > 0), x is time
* Understand for exponential growth, as x increases, y grows exponentially
* Understand that the standard form of an exponential function that represents decay is $y=a(1-r)^{x}$ where a is the initial value (a > 0), r is the rate of decay (0 < r < 1), x is time
* Understand for exponential decay, as x increases, y decreases exponentially
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| Resources: |  |  |  |  |

[MA.912.DP.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15744) Given a set of data, select an appropriate method to represent the data, depending on whether it is numerical or categorical data and on whether it is univariate or bivariate.

**Clarifications:**
*Clarification 1:* Instruction includes discussions regarding the strengths and weaknesses of each data display.

*Clarification 2:* Numerical univariate includes histograms, stem-and-leaf plots, box plots and line plots; numerical bivariate includes scatter plots and line graphs; categorical univariate includes bar charts, circle graphs, line plots, frequency tables and relative frequency tables; and categorical bivariate includes segmented bar charts, joint frequency tables and joint relative frequency tables.
*Clarification 3:* Instruction includes the use of appropriate units and labels and, where appropriate, using technology to create data displays.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.1.AP.1a:](https://www.cpalms.org/PreviewAccessPoint/Preview/18385)  | Given a set of data, select an appropriate table or graph to represent categorical data and whether it is univariate or bivariate. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: univariate data, bivariate data, categorical data, attribute, characteristics, bar graph, circle graph, frequency table, two-way table
* Understand that categorical data is data that is classified by attributes or characteristics (Ex. Favorite color, type of car, number on a sports jersey)
* Understand that univariate data has a single characteristic or attribute (Ex. Favorite color is a single attribute)
* Understand that bivariate data has two characteristics or attributes (Ex. Height and weight)
* Understand that categorical data can be represented by the following graphs: circle graph, bar graph (single bar graph, double bar graph, stacked bar graph)
* Understand that categorical data can be represented by the following tables: frequency table (univariate data), or two-way table (bivariate data)
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| Resources: |  |  |  |  |
| [MA.912.DP.1.AP.1b:](https://www.cpalms.org/PreviewAccessPoint/Preview/18386) | Given a set of data, select an appropriate table or graph to represent numerical data and whether it is univariate or bivariate. |  |  |  |
| EssentialUnderstandings | * Understand the following term and vocabulary: numerical data, univariate data, bivariate data, variable, dot plots, scatter plots, stem plots, frequency table, two-way table, value, measure
* Understand that numerical data is data that can be measured (Ex. The number of people who like the color green.)
* Understand that univariate data has a single variable (Ex. Variable is type of car and the data is how many people own each type of car)
* Understand that bivariate data is two numerical values paired with each other (Ex. Ordered pair (-2,3))
* Understand that numerical data can be represented by the following graphs: dot plots, scatter plots, or stem plots
* Understand that numerical data can be represented by the following tables: frequency table (univariate data), or two-way table (bivariate data)
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[MA.912.DP.1.2:](https://www.cpalms.org//PreviewStandard/Preview/15745) Interpret data distributions represented in various ways. State whether the data is numerical or categorical, whether it is univariate or bivariate and interpret the different components and quantities in the display.

**Clarifications:**
*Clarification 1*: Within the Probability and Statistics course, instruction includes the use of spreadsheets and technology.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.1.AP.2:](https://www.cpalms.org/PreviewAccessPoint/Preview/18387) | Given a univariate or bivariate data distribution (numerical or categorical), identify the different components and quantities in the display. |  |  |  |
| EssentialUnderstandings | * Understand the following term and vocabulary: univariate distribution, bivariate distribution, attributes, numerical data, categorical data, characteristics, frequency table, two-way table joint frequency, marginal frequency, margins, measure
* Understand that categorical data is data that is classified by attributes or characteristics (Ex. Favorite color, type of car, number on a sports jersey)
* Understand that numerical data is data that can be measured (Ex. The number of people who like the color green.)
* Understand that a bivariate distribution can be represented by a two-way table
* Understand that a univariate distribution can be represented by a frequency table
* Understand that a two-way table has two types of frequencies: joint frequencies (numbers inside the two-way table) and marginal frequencies (totals in the margins or edge of table)
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| Resources: |  |  |  |  |

[MA.912.DP.2.1:](https://www.cpalms.org/PreviewStandard/Preview/15749) For two or more sets of numerical univariate data, calculate and compare the appropriate measures of center and measures of variability, accounting for possible effects of outliers. Interpret any notable features of the shape of the data distribution.

**Clarifications:**
*Clarification 1*: The measure of center is limited to mean and median. The measure of variation is limited to range, interquartile range, and standard deviation.

*Clarification 2*: Shape features include symmetry or skewness and clustering.

*Clarification 3*: Within the Probability and Statistics course, instruction includes the use of spreadsheets and technology.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.2.AP.1](https://www.cpalms.org/PreviewAccessPoint/Preview/18625) | For two sets of numerical univariate data, calculate and compare the mean, median and range, then select the shape of the data from given graphs. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and Vocabulary: mean, range, numerical univariate data, graphs, median, less than, more than, skewed right, skewed left, symmetrical, approximately the same.
* Understand the shape of the data can be skewed left, skewed right or symmetrical.
* Understand how to calculate the mean, median, and range.
* Understand if the mean and median are approximately the same, the shape of the data is symmetric.
* Understand if the mean is less than the median, the shape of the data is skewed left.
* Understand if the mean is greater than the median, the shape of the data is skewed right
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| Resources: |  |  |  |  |

[MA.912.DP.2.4:](https://www.cpalms.org//PreviewStandard/Preview/15752) Fit a linear function to bivariate numerical data that suggests a linear association and interpret the slope and y-intercept of the model. Use the model to solve real-world problems in terms of the context of the data.

**Clarifications:**
*Clarification 1*: Instruction includes fitting a linear function both informally and formally with the use of technology.

*Clarification 2*: Problems include making a prediction or extrapolation, inside and outside the range of the data, based on the equation of the line of fit.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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|  [MA.912.DP.2.AP.4:](https://www.cpalms.org/PreviewAccessPoint/Preview/18390) | Fit a linear function to bivariate numerical data that suggests a linear association and interpret the slope and y-intercept of the model. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: linear function, linear association, data models, linear fit, bivariate numerical data, y-intercept, slope, x-axis, y-axis, steepness, positive, negative, linear model, left, right, upward, downward
* Understand that a linear association means the data models a line
* Understand that bivariate data is two numerical values paired with each other (Ex. Ordered pair (-2,3))
* Understand if the data models a linear fit, then a linear function in the form of $y=mx+b$ can be created to fit the data
* Understand that the linear function may not cross every point given
* Understand in a linear function the *y*-intercept is represented by the variable *b*
* Understand in a linear function the *y*-intercept is where the function crosses the y-axis
* Understand in a linear function, slope is represented by the variable *m*
* Understand in a linear function, slope measures the steepness of the line
* Understand in a linear model, if the slope is positive the points on the model will go upward from left to right
* Understand in a linear model, if the slope is negative the points on the model will go downward from left to right
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| Resources: |  |  |  |  |

[MA.912.DP.2.9:](https://www.cpalms.org//PreviewStandard/Preview/15901) Fit an exponential function to bivariate numerical data that suggests an exponential association. Use the model to solve real-world problems in terms of the context of the data.

**Clarifications:**
*Clarification 1*: Instruction focuses on determining whether an exponential model is appropriate by taking the logarithm of the dependent variable using spreadsheets and other technology.

*Clarification 2*: Instruction includes determining whether the transformed scatterplot has an appropriate line of best fit, and interpreting the y-intercept and slope of the line of best fit.

*Clarification 3*: Problems include making a prediction or extrapolation, inside and outside the range of the data, based on the equation of the line of fit.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.2.AP.9:](https://www.cpalms.org/PreviewAccessPoint/Preview/18393) | Given a scatter plot, select an exponential function that fits the data the best. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: scatter plot, exponential function, graph, ordered pairs, data
* Understand that an exponential function uses the following rule: $y=a^{x}$
* Understand to determine which function fits the data that is graphed, choose ordered pairs from the graph to plug into the given functions to determine which function is true
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| Resources: |  |  |  |  |

[MA.912.DP.4.1:](https://www.cpalms.org/PreviewStandard/Preview/15762) Describe events as subsets of a sample space using characteristics, or categories, of the outcomes, or as unions, intersections or complements of other events.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.4.AP.1](https://www.cpalms.org/PreviewAccessPoint/Preview/18629) | Given a sample space, select a subset of the sample space or given two sets, select the union, intersection, or complement of two sets. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: sample space, subset, set, union, intersection, complement, Venn Diagram, elements, member.
* Understand that a set is a group of objects.
* Understand that a sample space is all the possible outcomes in a set of items.
* Understand that a subset is a part of the sample space.
* Understand that a union is the combination of two or more sets together.
* Understand that an intersection of two or more sets is the elements they have in common.
* Understand the compliment of two or more sets is any element that is not a member of all given sets.
* Understand a Venn Diagram can be used to model the sets.
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| Resources: |  |  |  |  |

[MA.912.DP.4.2](https://www.cpalms.org/PreviewStandard/Preview/15763)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| MA.912.DP.4.AP.2 | Determine if events A and B are independent by calculating the product of their probabilities. |  |  |  |
| Essential Understandings | * Understand the following terms and vocabulary: probability, independent, product, events.
* Understand that independent events are events where the probability of one event does not affect the probability of another event. (Flipping a coin and rolling a die are independent because flipping the coin does not affect the probability of rolling a die).
* Understand that events are independent if the probability of A multiplied by the probability of B is equal to the probability of A and B ( P(A)P(B)=P(A and B)).
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| Resources: |  |  |  |  |

[MA.912.DP.4.3:](https://www.cpalms.org/PreviewStandard/Preview/15764) Calculate the conditional probability of two events and interpret the result in terms of its context.

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.912.DP.4.AP.3](https://www.cpalms.org/PreviewAccessPoint/Preview/18630) | Given the probability of two events, P(A and B) and P(A), in decimal form, select the conditional probability of the two events {[P(A and B))/(P(A)]}. |  |  |  |
| EssentialUnderstandings | * Understand the following terms and vocabulary: probability, events decimal form, conditional probability.
* Understand that conditional probability is the probability of an event occurring given that we have prior information. (The probability of surviving the sinking of the titanic given that the person is a female. Females were put in the lifeboats first therefore more likely to survive the accident.)
* Understand that the conditional probability of B given A is calculated by dividing the probability of A and B by the probability of A. (P(B│A)=(P(A and B))/(P(A)) ).
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| Resources: |  |  |  |  |

[MA.912.DP.4.4](https://www.cpalms.org/PreviewStandard/Preview/15765)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.FR.2.3:](https://www.cpalms.org//PreviewStandard/Preview/15359)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.4.FR.2.AP.3:](https://www.cpalms.org/PreviewAccessPoint/Preview/18083)  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.FR.2.4:](https://www.cpalms.org//PreviewStandard/Preview/15360)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.GR.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15372)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.4.GR.1.AP.1:](https://www.cpalms.org/PreviewAccessPoint/Preview/18099) |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.GR.1.2:](https://www.cpalms.org//PreviewStandard/Preview/15373)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.GR.1.3:](https://www.cpalms.org//PreviewStandard/Preview/15374)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| [MA.4.GR.1.AP.3:](https://www.cpalms.org/PreviewAccessPoint/Preview/18101)  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.GR.2.1:](https://www.cpalms.org//PreviewStandard/Preview/15375)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.GR.2.2:](https://www.cpalms.org//PreviewStandard/Preview/15376)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.M.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15368)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| Essential Understandings |  |  |  |  |
| Resources: |  |  |  |  |
| [MA.4.M.1.AP.1b:](https://www.cpalms.org/PreviewAccessPoint/Preview/18093)  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.M.1.2:](https://www.cpalms.org//PreviewStandard/Preview/15369)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| Essential Understandings |  |  |  |  |
| Resources: |  |  |  |  |
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| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.M.2.1:](https://www.cpalms.org//PreviewStandard/Preview/15370)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
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| Essential Understandings |  |  |  |  |
| Resources: |  |  |  |  |
|  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.M.2.2:](https://www.cpalms.org//PreviewStandard/Preview/15371)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|   |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15341)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.4.NSO.1.AP.1:](https://www.cpalms.org/PreviewAccessPoint/Preview/18064) |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.1.2:](https://www.cpalms.org//PreviewStandard/Preview/15342)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.1.3:](https://www.cpalms.org//PreviewStandard/Preview/15343).

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.1.4:](https://www.cpalms.org//PreviewStandard/Preview/15344)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.4.NSO.1.AP.4:](https://www.cpalms.org/PreviewAccessPoint/Preview/18067) |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.1.5:](https://www.cpalms.org//PreviewStandard/Preview/15345)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|   |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.1:](https://www.cpalms.org//PreviewStandard/Preview/15346)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|   |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.2:](https://www.cpalms.org//PreviewStandard/Preview/15347)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|   |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.3:](https://www.cpalms.org//PreviewStandard/Preview/15348)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.4:](https://www.cpalms.org//PreviewStandard/Preview/15349)

**Clarifications:**

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**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.5:](https://www.cpalms.org//PreviewStandard/Preview/15350)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.4.NSO.2.AP.5:](https://www.cpalms.org/PreviewAccessPoint/Preview/18073)  |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.6:](https://www.cpalms.org//PreviewStandard/Preview/15351)

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.4.NSO.2.AP.6:](https://www.cpalms.org/PreviewAccessPoint/Preview/18074) |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.4.NSO.2.7:](https://www.cpalms.org//PreviewStandard/Preview/15352)

**Clarifications:**

**Related Access Points**

| **Name** | **Description** | **Date(s) Instruction** | **Date(s) Assessment** | **Date Mastery** |
| --- | --- | --- | --- | --- |
| [MA.4.NSO.2.AP.7:](https://www.cpalms.org/PreviewAccessPoint/Preview/18075) |  |  |  |  |
| EssentialUnderstandings |  |  |  |  |
| Resources: |  |  |  |  |

[MA.K12.MTR.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15875) Actively participate in effortful learning both individually and collectively. Mathematicians who participate in effortful learning both individually and with others:

* Analyze the problem in a way that makes sense given the task.
* Ask questions that will help with solving the task.
* Build perseverance by modifying methods as needed while solving a challenging task.
* Stay engaged and maintain a positive mindset when working to solve tasks.
* Help and support each other when attempting a new method or approach.

**Clarifications:**
Teachers who encourage students to participate actively in effortful learning both individually and with others:

* Cultivate a community of growth mindset learners.
* Foster perseverance in students by choosing tasks that are challenging.
* Develop students’ ability to analyze and problem solve.
* Recognize students’ effort when solving challenging problems.

[MA.K12.MTR.2.1:](https://www.cpalms.org//PreviewStandard/Preview/15876) Demonstrate understanding by representing problems in multiple ways.

Mathematicians who demonstrate understanding by representing problems in multiple ways:

* Build understanding through modeling and using manipulatives.
* Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.
* Progress from modeling problems with objects and drawings to using algorithms and equations.
* Express connections between concepts and representations.
* Choose a representation based on the given context or purpose.

**Clarifications:**
Teachers who encourage students to demonstrate understanding by representing problems in multiple ways:

* Help students make connections between concepts and representations.
* Provide opportunities for students to use manipulatives when investigating concepts.
* Guide students from concrete to pictorial to abstract representations as understanding progresses.
* Show students that various representations can have different purposes and can be useful in different situations.

[MA.K12.MTR.3.1:](https://www.cpalms.org//PreviewStandard/Preview/15877) Complete tasks with mathematical fluency.

Mathematicians who complete tasks with mathematical fluency: Complete tasks with mathematical fluency.

* Select efficient and appropriate methods for solving problems within the given context.
* Maintain flexibility and accuracy while performing procedures and mental calculations.
* Complete tasks accurately and with confidence.
* Adapt procedures to apply them to a new context.
* Use feedback to improve efficiency when performing calculations.

**Clarifications:**
Teachers who encourage students to complete tasks with mathematical fluency:

* Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately.
* Offer multiple opportunities for students to practice efficient and generalizable methods.
* Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.

[MA.K12.MTR.4.1:](https://www.cpalms.org//PreviewStandard/Preview/15878) Engage in discussions that reflect on the mathematical thinking of self and others.

Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:

* Communicate mathematical ideas, vocabulary and methods effectively.
* Analyze the mathematical thinking of others.
* Compare the efficiency of a method to those expressed by others.
* Recognize errors and suggest how to correctly solve the task.
* Justify results by explaining methods and processes.
* Construct possible arguments based on evidence.

**Clarifications:**
Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

* Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
* Create opportunities for students to discuss their thinking with peers.
* Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
* Develop students’ ability to justify methods and compare their responses to the responses of their peers.

[MA.K12.MTR.5.1:](https://www.cpalms.org//PreviewStandard/Preview/15879) Use patterns and structure to help understand and connect mathematical concepts.

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

* Focus on relevant details within a problem.
* Create plans and procedures to logically order events, steps or ideas to solve problems.
* Decompose a complex problem into manageable parts.
* Relate previously learned concepts to new concepts.
* Look for similarities among problems.
* Connect solutions of problems to more complicated large-scale situations.

**Clarifications:**
Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

* Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
* Support students to develop generalizations based on the similarities found among problems.
* Provide opportunities for students to create plans and procedures to solve problems.
* Develop students’ ability to construct relationships between their current understanding and more sophisticated ways of thinking.

[MA.K12.MTR.6.1:](https://www.cpalms.org//PreviewStandard/Preview/15880) Assess the reasonableness of solutions.

Mathematicians who assess the reasonableness of solutions:

* Estimate to discover possible solutions.
* Use benchmark quantities to determine if a solution makes sense.
* Check calculations when solving problems.
* Verify possible solutions by explaining the methods used.
* Evaluate results based on the given context.

**Clarifications:**
Teachers who encourage students to assess the reasonableness of solutions:

* Have students estimate or predict solutions prior to solving.
* Prompt students to continually ask, “Does this solution make sense? How do you know?”
* Reinforce that students check their work as they progress within and after a task.
* Strengthen students’ ability to verify solutions through justifications.

[MA.K12.MTR.7.1:](https://www.cpalms.org//PreviewStandard/Preview/15881) Apply mathematics to real-world contexts.

Mathematicians who apply mathematics to real-world contexts:

* Connect mathematical concepts to everyday experiences.
* Use models and methods to understand, represent and solve problems.
* Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.

**Clarifications:**
Teachers who encourage students to apply mathematics to real-world contexts:

* Provide opportunities for students to create models, both concrete and abstract, and perform investigations.
* Challenge students to question the accuracy of their models and methods.
* Support students as they validate conclusions by comparing them to the given situation.
* Indicate how various concepts can be applied to other disciplines.

[ELA.K12.EE.1.1:](https://www.cpalms.org//PreviewStandard/Preview/15201) Cite evidence to explain and justify reasoning.

**Clarifications:**
K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing.

2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations.

4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they’ve directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor.

6-8 Students continue with previous skills and use a style guide to create a proper citation.

9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.

[ELA.K12.EE.2.1:](https://www.cpalms.org//PreviewStandard/Preview/15202) Read and comprehend grade-level complex texts proficiently.

**Clarifications:**
See [Text Complexity](https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/best/la/appendixb.pdf) for grade-level complexity bands and a text complexity rubric.

[ELA.K12.EE.3.1:](https://www.cpalms.org//PreviewStandard/Preview/15203) Make inferences to support comprehension.

**Clarifications:**
Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like “Why is the girl smiling?” or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.

[ELA.K12.EE.4.1:](https://www.cpalms.org//PreviewStandard/Preview/15204) Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations.

**Clarifications:**
In kindergarten, students learn to listen to one another respectfully.

In grades 1-2, students build upon these skills by justifying what they are thinking. For example: “I think \_\_\_\_\_\_\_\_ because \_\_\_\_\_\_\_.” The collaborative conversations are becoming academic conversations.

In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.

[ELA.K12.EE.5.1:](https://www.cpalms.org//PreviewStandard/Preview/15205) Use the accepted rules governing a specific format to create quality work.

**Clarifications:**
Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.

[ELA.K12.EE.6.1:](https://www.cpalms.org//PreviewStandard/Preview/15206) Use appropriate voice and tone when speaking or writing.

**Clarifications:**
In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.

[ELD.K12.ELL.MA.1:](https://www.cpalms.org//PreviewStandard/Preview/8642) English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

[ELD.K12.ELL.SI.1:](https://www.cpalms.org//PreviewStandard/Preview/8640) English language learners communicate for social and instructional purposes within the school setting.