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| Learning Objectives | Practices | Reason & Explanations | Notes |
| Algebra Skills  |
| **A.SSE.1.a** I know the vocabulary (expression, terms, factors, and coefficients) and can identify them in linear and exponential expressions. **A.REI.1** I can solve linear equations and justify each step in the solution using Algebraic properties.**A.REI.3.a** I can solve linear equations and inequalities in one variable. **A.REI.3.b** I can solve a literal equation for a given variable including equations with coefficients represented by letters.**For example:** A*x* + B*y* = c: solve for B**A.CED.4** I can isolate a variable in a formula. **For example:** Given , I can solve for *F*. |  |  |  |
| Geometry Constructions |
| **G.CO.1** I can precisely define an 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.**G.CO.12a** I can copy and construct a segment and an angle and explain why the procedure is accurate.**G.CO.12b** I can bisect a segment and an angle and explain why the procedure is accurate.**G.CO.13** I can construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle and explain why the procedure results in the desired object.**G.CO.7** I can show that two triangles are congruent if and only if corresponding pairs of sides and angles are congruent.**G.CO.8** I can identify the minimum conditions (ASA, SAS, AAS, SSS, or exceptions to SSA)**G.CO.12c** I can construct perpendicular lines, including the perpendicular bisector of a line segment; and construct a line parallel to a given line through a point not on a line and explain why the procedure results in the desired object. |  |  |  |
| Coordinate Geometry and Proofs of Quadrilaterals in Coordinate Plane |
| **G.GPE.7** I can use tools of coordinate geometry (distance formula) to compute perimeters of any polygon and areas of right triangles.**G.GPE.5a** I can determine if two lines are parallel, perpendicular or neither.**G.GPE.4** I can use the midpoint formula, slope, and the Pythagorean Theorem (distance formula) with coordinates to prove the following (but not limited to):* If both pairs of opposite sides of a quadrilateral are congruent then the quadrilateral is a parallelogram.
* Both pairs of opposite sides of a quadrilateral are parallel then the quadrilateral is a parallelogram.
* If one pair of opposite sides of a quadrilateral is parallel and congruent then the quadrilateral is a parallelogram.
* If the diagonals of a quadrilateral bisect each other then the quadrilateral is a parallelogram.
* If all four sides of a quadrilateral are parallel and congruent, then the quadrilateral is a rhombus.
* If all four angles of a quadrilateral are parallel and congruent, then the quadrilateral is a square.

If the opposite sides of a quadrilateral are both parallel and the consecutive sides are perpendicular, the quadrilateral is a rectangle. |  |  |  |
| Functions |
| **F.IF.1.d** I can explain what it means to be a function.**F.IF.1.c** I can identify whether a relation is a function by looking at a table of values or by looking at the graph.**F.IF.1.a** I can explain the relationship between *x* and , that  notation means “the *y*-value of the function *f* at *x*”.**F.IF.1.b** I can identify the domain (input, ­x­-value) and range (output, *y*-value, ) of a function from an equation, table, or graph.**F.IF.5** I can determine an appropriate domain for the given context of a function.**F.IF.2.a** I can evaluate functions in  notation for values in the domain.**F.IF.1.b** I can identify the domain (input, ­x­-value) and range (output, *y*-value, ) of a function from an equation, table, or graph.**F.IF.5** I can determine an appropriate domain for the given context of a function.**F.IF.2.a** I can evaluate functions in  notation for values in the domain.**F.BF.1.b** I can combine standard function types using arithmetic operations. **For example:** Find , , ,  given  and .**F.IF.2.b** I can interpret statements that use function notation in terms of a context. For example, given the amount of money in a savings account is , I can explain what  represents.**A.REI.10.a** I can identify the coordinates of a linear and exponential function from a graph as solutions to an equation/function.**A.REI.10.b** I can graph points that satisfy a linear or exponential function and explain the meaning of each coordinate in relation to the function, using function notation.**A.REI.10.c** I can explain why a continuous curve (including lines) contains an infinite number of solutions. |  |  |  |
| Review of Linear Functions |
| **F.LE.1.b** I can recognize contextual situations with a common difference between terms.**F.IF.3.c** I can recognize the relationship between arithmetic sequences and linear functions.**F.BF.2.a** I understand that a linear relationship can be represented as an arithmetic sequence. **F.LE.2.a** I can construct a linear function given either: **1)** an arithmetic sequence, **2)** a graph, **3)** a description or **4)** input/output pairs.**S.ID.7** Given a linear model, I can interpret the slope and the y-intercept in the context of the data.**F.IF.7.a** I can graph linear functions and identify slope and intercepts (simple cases by hand and complex cases using technology).**A.REI.12.a** I can graph the solution to linear inequalities in two variables and explain the meaning of the shaded regions (solutions) and non-shaded regions (not solutions).**S.ID.6.c**  I can use technology to create a linear regression for the data set.**G.GPE.5b** I can write an equation of a line through a point that is parallel or perpendicular to a given line. |  |  |  |
| Linear or Exponential |
| **F.IF.6.a** I can calculate and interpret the average rate of change of a function between two values. **F.IF.6.b** I can calculate and interpret the average rate of change of a function from a graph or table and explain what it means in terms of the function.**F.IF.6.c** I can estimate the (instantaneous) rate of change at a point from a graph.**F.LE.1.a** I understand and can prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.**F.LE.3** I can explain and show why a quantity increasing exponentially will eventually exceed a quantity increasing linearly.**A.CED.2.a** I can create two variable linear and exponential equations and use them to compare two quantities. **For example:** Given two populations that follow linear or exponential growth models, I can find when the populations will be the same, and which population is bigger in 20 years.**F.IF.9** I can compare properties of two functions represented in different ways.**For example:** Given a table of one function and a graph of another, find the best way to determine which function grows faster or has a greater y intercept.**F.LE.1.c** I can recognize contextual situations with a common ratio between terms.**F.BF.2.b** I understand that an exponential relationship can be represented as a geometric sequence.**F.IF.3.d** I can recognize the relationship between geometric sequences and exponential functions.**F.IF.3.b** I can recognize and find values of recursive sequences.**For example**: The Fibonacci sequence is defined recursively by *f(0) = f(1) =1*, *f(n+1)=f(n) +f(n-1)* for *n1*.**F.LE.1.c** I can recognize contextual situations with a common ratio between terms.**F.BF.2.b** I understand that an exponential relationship can be represented as a geometric sequence.**F.IF.3.d** I can recognize the relationship between geometric sequences and exponential functions.**F.IF.3.b** I can recognize and find values of recursive sequences.**For example**: The Fibonacci sequence is defined recursively by *f(0) = f(1) =1*, *f(n+1)=f(n) +f(n-1)* for *n1*.**F.BF.1.a** I can write an explicit expression (function rule) or recursive process that describes a linear or exponential relationship between two quantities.**F.BF.2.d** I can write an explicit rule given a recursive definition and vice versa.**F.LE.2.b** I can construct an exponential function given either: **1)** a geometric sequence, **2)** a graph, **3)** a description or **4)** input/output pairs. |  |  |  |
| Transformations |
| **G.CO.2.a** I can identify different transformations (translation, rotation, dilation, reflection) on an object.**G.CO.2.c** I can distinguish between rigid and non-rigid transformations.**G.CO.6a** I can identify the types of transformations that result in a rigid motion on a figure.**G.CO.6b** I can predict the effect of transformations to determine if two figures are congruent.**G.CO.5.b** I can describe the series of transformations from an image to a pre-image.**G.CO.2.b** I can perform a series of transformations on an object.**G.CO.5.a** I can perform a series of transformations on a figure (using graph paper, tracing paper, technology, etc). **G.CO.3.b** I can recognize rotational and reflectional symmetry.**G.CO.3.a** I can describe the rotations and reflections of a rectangle, parallelogram, trapezoid or regular polygon that carry it onto itself.**G.CO.4** I can define transformations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.**F.BF.3.a** I can identify and explain the following transformations on a linear or exponential function (with or without technology).**For example:**  (Vertical translation)  (Horizontal translation)  (Vertical stretch/compression, vertical reflection)  (Horizontal stretch/compression, horizontal reflection) **F.BF.3.b** I can determine the value of *k* (see above) given the graph. |  |  |  |
| Systems of Equations |
| **A.REI.11.c** I can explain why the *x*-coordinate at the point of intersection of two functions is the solution to .**For example:** Use graphs and tables to find the *x*-value(s) that results in an equal output for both functions: **A.REI.11.a** I can approximate solutions to a system of equations by graphing (with and without technology) to approximate the intersection of the curves.**A.REI.11.b** I can approximate solutions to a system of equations using tables (with and without technology).**A.REI.6** I can solve systems of linear equations in two variables using the following methods: **1)** Substitution **2**) Linear combination/Elimination **3**) Graphing**A.REI.5** I can explain why using a linear combination produces another equation that has the same solution as the original system of equations. **A.REI.12.b** I can graph the solution to systems of linear inequalities in two variables and explain the meaning of the shaded regions (solutions) and non-shaded regions (not solutions).**A.CED.3** Write and graph equations and inequalities representing constraints in contextual situations. **For example:** If I have $300 to spend, and hot dogs cost $2 per pound and hamburger costs $4 per pound, Determine what possible amounts of hamburger and hot dogs I can buy. **For example:** Linear programming |  |  |  |
| Distributions and Two-way Tables |
| **S.ID.1** I can create or interpret dot plots, histograms and box plots to represent data sets.**S.ID.2.a** I can compare distribution graphs using comparisons of center (median, mean) and spread (interquartile range, standard deviation).**S.ID.2.b** I can describe corresponding shapes of graphs given information about center and spread for data sets.**S.ID.3** I can describe the changes in shape, center and spread that are caused by outliers.**S.ID.5.a** I can create a two-way frequency table from categorical data.**S.ID.5.b** Given a 2-way table, I can count the following frequencies - Joint frequency - Marginal frequency - Conditional relative frequency**For example:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Spanish Class | French Class | German Class | Total |
| Boy | 18 | 10 | 15 | 43 |
| Girl | 20 | 7 | 3 | 30 |
| Total | 38 | 17 | 18 | 73 |

**Joint frequency:** What is the number of girls in German class?**Marginal frequency**: What is the number of students in French class?**Conditional relative frequency:** This really only applies to probability. |  |  |  |
| Modeling, Overarching (This unit does not exist on its own but should be included throughout the year as other units are taught.) |
| **N.Q.2** I can identify appropriate units for modeling different contextual situations.**For example:** It’s normally not appropriate to measure the height of a person in mm.**A.SSE.1.b** I can determine the real world context of the variables in an expression. **For example:** For  I understand what *P* andrepresent and how each affects the total amount. **N.Q.1.a** I can use unit analysis to help set up and solve contextual situations involving different units. **For example:** If my answer needs to be in feet and I have a rate of feet per second, I know I need to multiply by seconds to get the number of feet. **For example:** Which is the best unit rate: bottles per dollar or dollars per bottle?**N.Q.3** I can chose a level of accuracy appropriate to limitations on measurement when reporting quantities. **For example:** When finding the volume of a sphere, if the radius is given in cm, then the answer does not need to given to the nearest hundredth of a mm.**For example:** Do not round the answer until the end!!!!**For example:** Round appropriately based on context of the problem.**Note:** This standard should be taught throughout the year.**N.Q.1.b**  I can interpret and use the scales and units in a graph. **For example:** In the graph of the position of a car over time, where the scale on the y-axis is 15 miles, and the scale on the x-axis is 1 hour, I can find the velocity of the car in mph.**Note:** This standard should be taught throughout the year. |  |  |  |
| Modeling. This is how we compare linear and exponential functions. (This unit does not exist on its own but should be included throughout the year as other units are taught.) |
| **F.BF.2.c** I can model situations using arithmetic and geometric sequences**S.ID.6.a** I can fit a function to the data and use the function fitted to solve problems in the context of the data.**S.ID.6** I can make a scatter plot with and without technology and determine if the relationship is linear, exponential or neither.**S.ID.6.b.1** I can calculate the residuals. (Residuals are the vertical distances between each data point and a point on the regression function)**S.ID.6.b.2** I can make a residual plot with and without technology.**S.ID.6b.3** I can analyze a residual plot to assess the fit of the regression. (Good or bad fit)**S.ID.8** I can compute (using technology) and interpret the correlation coefficient.**S.ID.9** I can distinguish between correlation and causation.**F.LE.5** I can interpret the parameters of linear and exponential functions within a contextual situation.**For example:** Plant growth can be modeled with a function: y = 2x + 4. Explain the contextual meaning of 2 and 4 in terms of the plant.**For example:** Plant growth can be modeled with the function: y = . Explain the contextual meaning of 2 and 4 in terms of the plant.**A.CED.1** I can create linear and exponential equations and linear inequalities and use them to solve contextual situations. |  |  |  |
| Graphing Linear and Exponential Functions (This unit does not exist on its own but should be included throughout the year as other units are taught.) |
| **A.CED.2.b** I can graph a linear and exponential equation on the same coordinate axes with labels and scales. **F.IF.4.a** Given a linear or exponential function , I can identify the following from a graph or a table:* *x*- and *y*- intercepts
* Increasing and decreasing intervals
* Positive and negative intervals
* Maximum and minimum values (is this relevant to linear and exponential functions)
* Symmetry
* End behavior

**F.IF.4.b** I can sketch graphs of linear and exponential functions given the key features listed above.**F.IF7e** I can graph exponential functions and show the following key features of the graph (simple cases by hand and complex cases using technology):* Intercepts
* End behavior
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