**Math I**

| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Review | 2 Days<br>*Pre – Test, intro to calculators, class expectations | A.SSE.1a<br>G.GMD.1<br>N.Q.1<br>N.Q.2<br>N.Q.3 | Combining like Terms<br>Distributive Property<br>Writing expressions/equations<br><br>Use units as a way to understand problems<br><br>Define appropriate quantities for the purpose of descriptive modeling<br><br>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities | **Learning Target: I can interrupt expressions that represent a quantity in terms of its context.**<br>• I can interrupt parts of an expression, such as terms, factors, and coefficients. (A.SSE.1A)<br>• I can write an expression and equation given a word problem. (G.GMD.1) |

**Standards N.Q.1, N.Q.2 & N.Q.3 need to be reiterated whenever possible.

| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Equations | 4 Days | A.REI.1<br>A.REI.3<br>A.CED.4<br>G.GMD.1<br>A.CED.1<br>A.CED.3 | solving and justifying solving simple equations<br><br>solve linear equations in one variable, literal equations rearrange formulas (literal equations)<br><br>use volume formulas<br>• C=2*pi*r<br>• A=pi*r^2<br>•<br>create equations and use them to solve problems<br><br>represent constraints by equations and interpret solutions as viable or nonviable (this can be done as you do word problems for linear equations) | **Learning Target: I can evaluate, solve and justify solutions for linear equations in one variable.**<br><br>• I can create equations and use them to solve problems. (A.REI.1,3, A.CED.1, 3)<br><br>• I can use and justify algebraic steps to rearrange a linear equation to highlight a quantity of interest.(A.CED.4, A.REI.1, 3)<br><br>• I can defend the reasonableness of a solution according to the context of the problem. (A.CED.3)<br><br>• I can rewrite a formula and solve for different variables. (G.GMD.1 and (A.CED.4)<br><br>• I can use distance in the coordinate plane to find the perimeter of polygons and the area of triangles and rectangles. (G.GPE.7) |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Inequalities | 2 Days | A.REI.3<br>A.CED.3<br>A.CED.1 | solve linear inequalities<br><br>represent constraints by inequalities and interpret solutions<br><br>create inequalities and use them to solve problems | **Learning Target: I can evaluate, solve and justify solutions for inequalities in one variable.**<br><br>• I can create inequalities and use them to solve problems. (A.REI. 3, A.CED.1, 3)<br><br>• I can defend the reasonableness of a solution according to the context of the problem. (A.CED.3) |

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**Math I**

| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Linear Functions | 16 Days<br><br>*Review Slop by graphs and using the formula.<br><br>*Review putting equations into slope intercept form (solving for y)<br><br>* Write equations of lines<br><br>* Build functions | A.CED.1<br>A.CED.2<br>A.CED.3<br>A.REI.10<br>A.SSE.1<br>A.SSE.2<br>F.BF.1<br>F.BF.2<br>F.BF.3<br>F.IF.1<br>F.IF.2<br>F.IF.3<br>F.IF.4<br>F.IF.5<br>F.IF.6<br>F.IF.7a<br>F.IF.9<br>F.LE.2<br>F.LE.5<br>G.GPE.5 | represent and solve equations and inequalities graphically<br><br>graph functions expressed symbolically and show key features of the graph (Max/Min, and x and y intercepts)<br><br>create equations and represent their constraints<br><br>define domain and range<br><br>function notation (includes evaluation)<br><br>interpret functions that arise in applications<br><br>interpret the parameters in a linear function in terms of a context<br><br>relate domain to the relationship it describes<br><br>recursive functions – Basic understanding of the formula)<br><br>calculate and interpret average rate of change (intervals among graphs/tables)<br><br>vertical/horizontal translations of linear functions<br><br>build functions<br><br>prove the slope criteria for parallel and perpendicular lines<br><br>Compare properties of linear function (y-intercepts) | **Learning Target: I can apply the concept of a function to analyze and solve problems.**<br>• I can determine if a relationship between two sets of values, the domain and the range, is a function.(F.IF.1)<br>• I can use and interpret function notation appropriately. (F.IF.2)<br>• I can recognize sequences and match them to explicit functions. (F.IF.3)<br>• I can relate the domain of a function to its graph and, where applicable, to the relationship it describes (F.IF.5)<br>*HP: I can explain the definition of a function and provide examples and non-examples in a variety of ways.*<br><br>**Learning Target: I can identify key features of a function and interpret them in terms of the context.**<br>• I can use a function rule to create a graph and a table. (F.BF.1)<br>• I can describe a function as increasing, decreasing, or both. (F.IF.4)<br>• I can identify intercepts from a table or graph and interpret them in terms of the context. (F.IF.4)<br>• I can sketch graphs showing key features given a verbal description of the relationship. (F.IF.4)<br>• I can calculate and interpret the average rate of change of a function over a specified interval. (F.IF.6)<br>*HP: I can compare the key features of two functions and interpret similarities and differences in terms of the context.*<br><br>**Learning Target: I can create and analyze representations of linear functions.**<br>• I can create another representation of a linear pattern given any one of re cursive rule, function rule,table, graph, and/or contextual situation. (A.CED.1, 2, F.BF.1,2, F.LE.2)<br>• I can determine and explain the rate of change and/or the initial value of a linear pattern given anyrepresentation. (A.SSE.1, F.IF.4,6)<br>• I can rewrite linear expressions in equivalent forms. (F-FI.8)<br>• I can provide a reasonable domain for a linear function given a contextual situation and/or a graph. (F-IF.5)<br>• I can compare and contrast two different linear functions given any repre sentation. (F-IF.9)<br>*HP: I can write a recursive rule or a function rule when the rate of change and init ial value are notexplicitly stated. (SMP 1)* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Systems of Equations/ Inequalities | 6 Days | A.CED.3<br>A.REI.11<br>A.REI.12<br>A.REI.5<br>A.REI.6 | solve systems of equations exactly and approximately<br><br>elimination and substitution method<br><br>explain why the solutions work<br><br>graph solutions to a system of linear inequalities (identify quadrant where the majority of the solution occurs)<br><br>represent constraints on systems of equations/inequalities and interpret solutions as viable/non-viable | **Learning Target: I can construct and solve systems of linear equations and inequalities.**<br>• I can represent problems as a system of two linear equations or inequalities. (A.CED.3)<br>• I can solve a system of equations by tables and graphs. (A.REI.11, A.REI.6)<br>• I can solve a system of linear equations by elimination. (A.REI.5)<br>• I can defend the reasonableness of a solution according to the context of the problem. (A.CED.3)<br>• I can graph a system of linear inequalities and discuss the solutions. (A.CED.3, A.REI.12) |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Polynomials | 4 Days | A.APR.1 | Review Exponent Rules FIRST.<br><br>operations on polynomials (add/subtract/multiply)<br><br>Writing expressions in order to find perimeter and/or area of shapes | **Learning Target: I can understand that polynomials form a system analogous to the integers.**<br>• I can add and subtract expressions with degree less than or equal to 2. (A.APR.1)<br>• I can interrupt parts of an expression, such as terms, factors, and coefficients. (A.SSE.1A)<br>• I can multiply binomial expressions (A.APR.1)<br>• I can multiply binomial expressions and then add or subtract these expressions in order to simplify (A.APR.1)<br>• I can write expressions and use polynomial rules to find the area and/or perimeter of shapes. |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Quadratics | 10 Days | A.CED.2<br>A.SSE.1a<br>A.SSE.2<br>A.SSE.3<br>F.BF.1<br>F.IF.4<br>F.IF.7a<br>F.IF.8a<br>F.IF.9 | interpret parts of an expressions, such as terms, factors, coefficients<br><br>difference of squares<br><br>factor quadratics to reveal zeros<br><br>use the process of factoring to show zeros, extreme values, symmetry<br><br>graph quadratic functions to show intercepts, max and min<br><br>interpret functions that arise in applications in terms of context<br><br>build a function that models a relationship between two quantities<br><br>Be flexible in using multiple forms of quadratics from context<br><br>Compare properties of 2 quadratics given in different forms. | **Learning Target: I can write a rule to represent a quadratic function through arithmetic operations and in context.**<br>• I can rewrite quadratic functions in equivalent forms (limited to factored form and $ax^2+bx+c$ form). (A.SSE.2, A.SSE.3, F.IF.8)<br>• I can write a quadratic function from context (limited to projectile motion). (A.CED.2, F.BF.1)<br>*HP: I can write a quadratic function from context by combining expressions using addition, subtraction, and/or multiplication operations. (A.APR.1, F.BF.1)*<br><br>**Learning Target: I can interpret key features of quadratic functions using table, graph, rule, and in context.**<br>• I can interpret the key features in context of a quadratic function given a graph, and/or table. (Note: key features include domain, zeros, y intercept, maximum/minimum, symmetry, and direction) (F.IF.4,F.IF.5)<br>• I can sketch a graph of a quadratic function by identifying and using the key features from the function rule. (F.IF.4, F.IF.7)<br>• I can describe the intervals of increase and decrease for a quadratic function. (F.IF.4)<br>• I can compare the key features of two quadratic functions represented in different ways. (F.IF.9)<br>*HP: I can explain the limitations of interpreting key features in context. (F.IF.5, N.Q.3)* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Exponents & Radicals | 6 Days<br><br>* There seems to be a bigger emphasis on understanding and applying exponential functions in common core. | N.RN.1<br>N.RN.2 | definition of rational exponents<br><br>rewrite expressions involving radicals/rational expressions<br><br>Properties/Rules of Exponents<br><br>Rational Exponents involving tables | **Learning Target: I can rewrite expressions involving exponents.**<br>• I can apply the rules of exponents to rewrite expressions with integer exponents into equivalent forms. (N.RN.1)<br>• I can apply the rules of exponents to rewrite expressions with rational exponents (with a numerator of one). (N.RN.1)<br>• I can rewrite expressions involving radicals. (N.RN.2)<br>• I can justify why rational exponents do not become a negative value.<br>• I can make predictions by writing expressions when given a table of values.<br><br>*HP: I can justify the use of the rules of exponents, including a^(1/n) is the nth root of a. (N.RN.2)* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Exponential Functions | 5 Days | A.CED.1<br>A.CED.2<br>A.REI.10<br>F.IF.7<br>A.SSE.1b<br>F.BF.1<br>F.IF.2<br>F.IF.4<br>F.IF.5<br>F.IF.8b<br>F.IF.9<br>F.LE.2<br>F.LE.5<br>S.ID.6 | interpret the parameters in exponential functions in terms of a context<br><br>use properties of exponents to interpret expressions for exponential functions (identify growth/decay)<br><br>interpret complicated expressions as their parts<br><br>create equations and use them to solve problems (exponential regression)<br><br>build a function that describes a relationship between 2 quantities<br><br>understand the graph of an equation often forms a curve and graph exponentials showing intercepts<br><br>use functions notation and relate the domain of a function<br><br>construct exponential functions from a graph, relationship, or input-output pairs<br><br>evaluate exponential functions<br><br>find key features of a graph in applications | **Learning Target: I can create and analyze representations of exponential functions.**<br>• I can create another representation of an exponential pattern given any one of recursive rule, function rule, table, graph, and/or contextual situation.(A.CED.1, 2, F.IF.7, F.BF.1, F.LE.2)<br>• I can determine and explain the rate of change and/or initial value of an exponential pattern given any representation. (A.SSE.1, F.LE.5)<br>• I can provide a reasonable domain for an exponential function given a contextual situation and/or a graph. (F.IF.5)<br>• I can fit an exponential function to data and describe how the variables are related. (S.ID.6)<br><br>*HP: I can create an exponential function to model a contextual situation and modify the parameters when additional information is given. (SMP 7)*<br><br>**Learning Target : I can interpret exponential functions and use them to solve problems.**<br>• I can compare and contrast two different exponential functions given any representation. (F.IF.9)<br>• I can approximate solutions to exponential equations using tables and graphs. (A.CED.1)<br>• I can defend the reasonableness of a solution according to the context of the problem.<br>• I can simplify an exponential function that uses rational exponents and explain what the values mean in context of the problem. (F.IF.8b)<br><br>*HP: I can rewrite exponential expressions from a contextual situation in equivalent forms using the rules of exponents. (F.IF.8b)* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Translations<br>• May be combined with Comparing Functions module.<br>• | 3 Days | F.BF.3<br>F.IF.4 | vertical/horizontal translations | **Learning Target: I can compare properties of linear, exponential, and quadratic functions.**<br>• I can examine the translation of a graph of a linear and/or exponential function and rewrite the function rule to show the translation performed. (F.BF.3)<br>• I can explain the effects of a linear and/or exponential graph when f(x) is replaced by f(x)+k or f(x+k). (F.BF.3)<br>• I can compare and contrast two different exponential functions given any representation. (F.IF.9) |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Comparing Functions<br>May be combined with Translations module. | 4 Days<br>* At this point, review linear, quadratic and exponential functions their graphs and their equations. | F.IF.9<br>F.LE.1<br>F.LE.2<br>F.LE.3<br>F.LE.5 | observe using functions and tables that a quantity increasing exponentially eventually exceeds a linear or quadratic<br><br>construct and compare, quadratic, linear and exponential models and solve problems<br><br>compare properties of two functions represented in different ways | **Learning Target: I can compare properties of linear, exponential, and quadratic functions.**<br>• I can compare the growth of a linear, exponential, and quadratic function using graphs and tables.(F.LE.3)<br>• I can distinguish between situations that can be modeled with linear functions or exponential functions and write a rule. (F.LE.1,2)<br><br>*HP: I can experiment with linear and exponential models for a set of data, decide on a model that seems to be a good fit, and justify the decision.* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Geometry | 5 Days | A.CED.4<br>A.REI.3<br>G.CO.1<br>G.GMD.3<br>G.GMD.1<br>G.GPE.4<br>G.GPE.7<br>G.GPE.5<br>G.GPE.6 | definitions of angle, circle, perpendicular, parallel, line segment<br><br>midpoint formula<br>distance formula to prove points are on a line and to find perimeters of polygons and areas of triangles/rectangles | **Learning Target: I can use coordinates to prove geometric properties.**<br>• I can use distance and slope to identify types of triangles or quadrilaterals. (G.GPE.4, G.GPE.5)<br>• I can write the equation of a line that is parallel or perpendicular to a given line (given two points, equation, or a graph). (G.GPE.5, G.CO.1)<br>• I can find the midpoint of a line segment and use it to solve problems (including given the midpoint, find the other endpoint). (G.GPE.4, G.GPE.6)<br><br>*HP: I can use slope, distance, or midpoint to prove unfamiliar properties of shapes. (G.GPE.7)*<br><br>**Learning Target : I can apply volume formulas to solve problems.**<br>(Formulas for pyramids, cones, and spheres will be given, students must know the formula for a cylinder)<br>• I can apply formulas for volume of pyramids, cylinders, cones, and spheres to solve real-world problems. (G.GMD.1, G.GMD.3)<br>• I can apply formulas for volume of pyramids, cylinders, cones, and spheres to determine the volume of a composite shape. (G.GMD.1, G.GMD.3)<br>• I can use the volume of a shape to determine the value an unknown dimension of that shape. (G.GMD.3,A.REI.3, A.CED.4)<br><br>*HP: I can break down geometric figures into recognizable components to defend formulas for area and volume, including circumference and area of a circle and volume of a cylinder, pyramid, and cone.(G.GMD)* |

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| Topic | Days | Standards | Needs to be Covered | Learning Targets and "I Can" Statements |
|---|---|---|---|---|
| Data | 5 Days<br>* Review plotting points, introduce terms such as point, line segment domain, range. | S.ID.1<br>S.ID.2<br>S.ID.3<br>S.ID.5<br>S.ID.6<br>S.ID.7<br>S.ID.8<br>S.ID.9 | dot plots, histograms, box plots<br><br>data distribution and spread<br><br>interpret differences in shapes, outliers<br><br>Summarize categorical data for 2 categories in 2 way frequency tables.<br><br>Interpret relative frequencies in the context of the data.<br><br>Recognize possible associations and trends<br><br>Scatter plots<br><br>Linear, quadratic, and exponential models<br><br>Interpret the slop and the intercept of a linear model in the context of the data<br><br>Compute (using technology) and interpret the correlation coefficient of a linear fit<br><br>Distinguish between correlation and causation | **Learning Target: I can compare two sets of data using graphs and summary statistics appropriate to the shapes of the graphs.**<br>• I can create a graph of data, using technology when possible, including dot plots, histograms, and boxplots. (S.ID.1)<br>• I can choose, calculate, and interpret a measure of center (mean or median) appropriate to the shape of a distribution. (S.ID.2)<br>• I can choose, calculate, and interpret a measure of spread (interquartile range or standard deviation) appropriate to the shape of a distribution. (S.ID.2)<br>• I can interpret, in context, differences in the shape, center, and spread of two or more sets of data.(S.ID.3)<br><br>*HP: I can create a distribution given the summary statistics.*<br><br>**Learning Target: I can summarize and interpret categorical data.**<br>• I can calculate relative frequencies from a two way frequency table. (S.ID.5)<br>• I can compare relative frequencies from two different data sets.(S.ID.5)<br>• I can use relative frequencies to describe possible associations and trends in data. (S.ID.5)<br><br>*HP: I can create and analyze a two way frequency table to analyze categorical data.*<br><br>**Learning Target: I can create, interpret, and analyze linear models.**<br>• I can create a scatterplot and analyze it to describe how two variables are related. (S.ID.6)<br>• I can find an appropriate function for a set of data and use it to solve problems in the context of the data.(S.ID.6)<br>• I can use residuals to assess the fit of a function. (S.ID.6)<br>• I can interpret the slope and intercept of a linear model in the |

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| | | | Compute new data after changing a piece of data and compare to origina | context of the data. (S.ID.7)<br>• I can assess the strength and direction of a linear association by examining the correlation coefficient (calculated using technology). (S.ID.8)<br>• I can identify possible explanations for an association between two variables, including cause-and-effect. (S.ID.9)<br><br>*HP: I can compare different linear models for the same set of data and justify the choice of one over the other.* |

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# Pacing Guide for Math I

This pacing guide has been divided into units. There are several standards that can be located into different units.

*Standards N.Q.1, N.Q.2 & N.Q.3 need to be reiterated whenever possible.

*Keep in mind that part of the Math I exam is calculator inactive so students will need practice without the calculator.

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**Math I**

Unit 1 - Review (2 days)

- Pre-Test
- Introduction to Calculator
- Combining like Terms
- Distributive Property
- Writing expressions/equations
- Patterns

Unit 2 - Equations (4 days)

- Solving all types
- Literal equations
- Use of formulas

Unit 3 - Inequalities (2 days)

- Solve Linear inequalities
- Writing inequalities as a real life application

Unit 4 -Linear Functions (16 days)

- Define functions, domain and range
- Slope (calculating from graph, table, formula and comparing)
- Define parallel and perpendicular
- Solving for y.
- Graphing lines with and without a calculator
- Real life application of slope intercept form.
- Writing equations of lines
- Reading and understanding scatter plots
- Lines of best fit/Regression

Unit 5 - Systems of Equations/Inequalities (6 days)

- Solving systems of equations using the calculator and elimination.
- Systems of equations application problems (word problems)
- Solving systems of inequalities with a without the calculator

Unit 6 - Polynomials (4 days)

- Adding and subtracting polynomials
- Multiplying Polynomials
- Multiplying binomial by trinomial

Unit 7 - Quadratics (10 days)

- all types of factoring
- Solving quadratics
- Graphing quadratics with and without a calculator
- finding roots, max and min
- Writing equations of quadratics given a table or chart.

Unit 8 - Exponents & Radicals (6 days)

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- Exponent rules
- Zero as an exponent
- Negative Exponents
- Radial notation (rewriting and simplifying)

Unit 9 - Exponential Functions (5 days)

- Graphing
- Growth/Decay
- Writing Equations

Unit 10 - Translations (3 days)

- Understanding movements of up, down, left, right on a graph

Unit 11- Comparing Functions (4 days)

- Compare linear, quadratics, and exponential

Unit 12 - Geometry (5 days)

- Midpoint formula
- Distance Formula
- Perimeter and Area
- Pythagorean Theorem
- Parallel and Perpendicular

Unit 13 - Data (5 days)

- Mean. Median, mode, range, quartiles, interquartiles range, standard deviation.
- Box and Whisker
- Histograms and Dot plots
- Frequency Tables
- Variability and peaks

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