G-E-T High School Curriculum
Align, Explore, Empower
Scope and Sequence
Technical Math

Unit 0 Decimals, Fractions, and Percentages ~ 2 weeks

In this unit, students will review rounding decimals and converting fractions to decimals. They will also add, subtract, multiply, and divide fractions. Students will review converting improper fractions to mixed numbers and simplifying fractions. They will also apply sales tax and discounts and solve percent problems.

Standards for Technical Math

6.NS.1: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.RP.3.c: Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Unit 1 - Linear Equations and Inequalities ~ 5 weeks

In this unit, students will solve a variety of linear equations, write linear equations from word problems, and solve equations and formulas for a given variable. They will also solve linear inequalities and graph both linear equations and inequalities given a variety of information. Students will find slope and write linear equations given a variety of information such as two points, a graph, slope and one point, or a word problem. They will also calculate the rate of change from data points and describe the meaning of it.

Standards for Technical Math

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

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

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).

A-CED.4: Rearrange 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.*

F-IF.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

F-LE.2: 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).

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

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.

Unit 2 - System of Equations and Inequalities	~ 4 weeks
In this unit, students will solve a linear system of equations by graphing, substitution, and elimination. They will also solve a system of Inequalities by graphing. Students will write a system of equations from word problems and solve them.	

Standards for Technical Math

A-CED.1: Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*

A-CED.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-CED.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non- viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

A-REI.5: Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

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

A-REI.11: Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; nd the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

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.

Unit 3 Quadratics ~ 5 weeks

In this unit, students will graph quadratic equations and solve quadratics by graphing. They will also factor quadratics and solve quadratic equations by factoring. Students will solve quadratic equations by applying the square root property and the quadratic formula. They will also write and solve quadratics from word problems.

Standards for Technical Math

A-SSE.1a: Interpret parts of an expression, such as terms, factors, and coefficients.

A-SSE.3a: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.

A-REI.4b: Solve quadratic equations by inspection (e.g., for $x2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.

Unit 4 Finding Angles ~ 3 weeks

In this unit, students will find a variety of missing angles in triangles, quadrilaterals, and other polygons. They will also find angles dealing with parallel lines and transversals along with vertical and linear angles. Students will also use and apply central and inscribed angle properties.

Standards for Technical Math

G-CO.9: Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on the perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*

G-CO.10: Prove theorems about triangles. *Theorems include: measure of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*

G-CO.11: Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*

G-C.2: Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*

Unit 5 Trigonometry and Right Triangles ~ 5 weeks

In this unit, students will apply the Pythagorean theorem. They will use sine, cosine, and tangent to find missing sides and angles in right triangles. Students will apply the Law of Sines to find missing sides and angles for all triangles. They will also use trigonometry functions to solve word and application problems.

Standards for Technical Math

G-SRT.6: Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

G-SRT.7: Explain and use the relationship between the sine and cosine of complementary angles.

G.SRT.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

G.SRT.10: Prove the Laws of Sines and Cosines and use them to solve problems.

G.SRT.11: Understand and apply the Law of Sines and the Law of Cosines to and unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

Unit 6 Area, Surface Area and Volume of 2 & 3 Dimensional Figures ~ 5 weeks

In this unit, students will find the area of two dimensional shapes including compound figures. They will also find the surface area and volume of three dimensional solids including composite figures. Students will also apply formulas for area, surface area, and volume to word and application problems.

Standards for Technical Math

G-GPE.7: Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

G-GMD.1: Give an informal argument for the formulas for the circumference of a circle, the area of a circle, the volume of cylinders, pyramids, and cones. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*

G-GMD.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

G-MG.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

G-MG.3: Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Unit 7 Budget/Financial	~ 4 weeks
In this unit, students will create a monthly budget. They will need to complete a budget sheet for groceries, balance and use a checkbook, create a loan for furniture and a car. Students will work with percents and loan terms. They will also look at savings and other monthly costs.	

Standards for Technical Math
High School-Modeling Standard: Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data.