2021-2022 8th Grade Level
Year At A Glance

<table>
<tr><th colspan="4">First Semester</th></tr>
<tr><th colspan="2">1st Nine Weeks – 41 days
(August 16th – October 13th)
(September 6th – Labor day – No School)
(October 11th – Staff Development)</th><th colspan="2">2nd Nine Weeks – 42days
(October 14th – December 17st)
(November 23rd – 27th – Thanksgiving Break)
(December 20th – January 2nd– Holiday Break)</th></tr>
<tr><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.2A, 8.2B, 8.2C, 8.2D</td><td>Real Number System & Scientific Notation

Students continue to examine the sets and subsets of rational numbers and use a visual representation, such as a Venn diagram, to describe the relationships between the sets and subsets. Rational numbers are the focus of this unit as students order a set of rational numbers that arise from mathematical and real-world situations. Students extend previous understandings of the relationships within the base-10 place value system as they convert between standard decimal notation and scientific notation. Both positive and negative numbers are represented with standard decimal notation and scientific notation, including values greater than and less than one.</td><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.4B, 8.5A, 8.5B, 8.5E, 8.5F, 8.5G, 8.5H, 8.9A,8.11A</td><td>Bivariate Data (Introduction of Scatterplots) & Functions
Students must identify functions using sets of ordered pairs, tables, mappings, and graphs. Examining proportional and non-proportional linear relationships is extended to include identifying proportional and non-proportional linear functions in mathematical and real-world problems. Students contrast graphical representations of bivariate sets of data that suggest linear relationships with bivariate sets of data that do not suggest a linear relationship. Scatterplots are constructed from bivariate sets of data and used to describe the observed data. Observations include questions of association such as linear (positive or negative trend), non-linear, or no association.</td></tr>
<tr><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.8A, 8.8B, 8.8C,</td><td>One Variable Equations & Inequalities

Students extend their understanding of modeling and solving one-variable equations that represent mathematical and real-world problems from variables on one-side of the equality sign to variables on both sides of the equality sign using rational number coefficients and constants. When solving one-variable equations with variables on both sides of the equality sign, students distinguish between types of solutions as one solution, no solution, and infinite solutions (all real numbers). Students also extend their knowledge of writing one-variable equations or inequalities from variables on one-side of the equality sign to variables on both sides of the equality sign to represent problems using rational number coefficients and constants.</td><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.4A, 8.4B, 8.4C, 8.5A, 8.5B, 8.5E, 8.5F, 8.5G, 8.5H, 8.9A,</td><td>Linear Relationships-Proportional, Nonproportional, and Systems
Students use similar right triangles to develop an understanding of slope. This approach lends itself to the development of the formula for slope by determining the ratio of the change in y-values compared to the change in x-values is the same for any two points on the same line. Students use data from a table or graph to determine the rate of change or slope and the y-intercept.Students extend their previous understandings of slope and y-intercept to represent proportional and non-proportional linear situations with tables, graphs, and equations. These representations are used as students distinguish between proportional and non-proportional linear situations. Students specifically examine the relationship between the unit rate and slope of a line that represents a proportional linear situation. Problem situations involving direct variation are included within this unit as they are also proportional linear situations. Graphical representations of linear equations are examined closely as students begin to develop the understanding of systems of equations. Students are expected to identify the values of x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations. Students must also verify these values algebraically with the equations that represent the two graphed linear equations</td></tr>
<tr><td></td><td></td><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.2B 8.6C, 8.7C, 8.7D,</td><td>Pythagorean Theorem
Right triangles are examined closely within this unit as students use models to explain the Pythagorean Theorem. Students use the Pythagorean Theorem and its converse to solve problems and apply these understandings to the coordinate plane as they determine the distance between two points on the coordinate plane.</td></tr>
<tr><td></td><td></td><td>8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.8D</td><td>Angle Relationships
Students are expected to use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</td></tr>
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Second Semester			
3rd Nine Weeks – 43 days (January 4th– March 4th) *(January 17th – MLK – No School)* *(February 21st -President'sDay)* *(March 7th – 11th – Spring Break)*		**4th Nine Weeks – 51 days** (March 14th – May 25th) *(April 15th – Good Friday – No School)* *(April 8th– Battle of Flowers – No School)*	
8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.3A, 8.3B, 8.3C, 8.10A, 8.10B, 8.10C, 8.10D	**Transformations** Students develop transformational geometry concepts as they examine orientation and congruence of transformations. Students extend concepts of similarity to dilations on a coordinate plane as they compare and contrast a shape and its dilation(s). The concept of proportionality is revisited as students generalize the ratio of corresponding sides of a shape and its dilation as well as use an algebraic representation to explain the effect of dilation(s) on a coordinate plane. Properties of orientation and congruence are examined as students generalize the properties as they apply to rotations, reflections, translations, and dilations of two-dimensional figures on a coordinate plane. Students must distinguish between transformations that preserve congruence and those that do not. Students are expected to use an algebraic representation to explain the effect of translations, reflections over the *x*- or *y*- axis, dilations when a positive rational number scale factor is applied to a shape, and rotations limited to 90°, 180°, 270°, and 360°. The relationship between linear and area measurements of a shape and its dilation are also examined as students model the relationship and determine that the measurements are affected by both the scale factor and the dimension (one- or two-dimensional) of the measurement. Students are expected to generalize when a scale factor is applied to all of the dimensions of a two-dimensional shape, the perimeter is multiplied by the same scale factor while the area is multiplied by the scale factor squared.	8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.12A, 8.12B, 8.12C, 8.12D, 8.12E, 8.12F, 8.12G	**Financial Literacy** Students extend their understanding of percent and formulas to compare interest rates, including simple and compound interest, and loan lengths. Students investigate the effect of the cost of credit and the total cost of repaying that credit, whether it be with credit cards or loans. They also use an online calculator to compare different payment methods. Students compare the advantages and disadvantages of various payment methods and analyze situations that constitute financial responsibility and irresponsibility. Lastly, students estimate the cost of attending a two-year and four-year college and devise a savings plan to pay for the total estimated costs for at least the first year of attendance.
		8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.11B, 8.11C	**Statistics/Mean Absolute Deviation** Students extend their knowledge of ordering numbers and finding the mean to calculate the mean absolute deviation of up to 10 data points and describe the data by comparing each data point to the mean absolute deviation. Univariate data, data with one variable, is examined as students describe the spread and shape of data through the lens of variation from the mean. Additionally, students develop the notion that random samples of a population with known characteristics are representative of a population from which they were selected. Students explore appropriate methods for simulating such samples.
8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.7B	**Surface Area** Students also solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net. The concept of surface area is extended from finding the sum of the areas of the faces from the net to abstract formulas for lateral and total surface area. Students are expected to use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders.	8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.4B, 8.5A, 8.5B, 8.5C, 8.5D, 8.5I, 8.9A, 8.11A	**Essential Understandings of Algebra** Students revisit and solidify essential understandings of algebra. Students extend their previous understandings of slope and *y*-intercept to represent proportional and non-proportional linear situations with tables, graphs, and equations. These representations are used as students distinguish between proportional and non-proportional linear situations. Students specifically examine the relationship between the unit rate and slope of a line that represents a proportional linear situation. Graphical representations of linear equations are examined closely as students begin to develop the understanding of systems of equations. Students are expected to identify the values of *x* and *y* that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations. Students must also verify these values algebraically with the equations that represent the two graphed linear equations. Examining proportional and non-proportional linear relationships is extended to include identifying proportional and non-proportional linear functions in mathematical and real-world problems. A deep understanding of the characteristics of functions is essential to future mathematics coursework beyond Grade 8. Students continue to examine characteristics of linear relationships through the lens of trend lines that approximate the relationship between bivariate sets of data. Students contrast graphical representations of bivariate sets of data that suggest linear relationships with bivariate sets of data that do not suggest a linear relationship. Scatterplots are constructed from bivariate sets of data and used to describe the observed data.
8.1A, 8.1B, 8.1C, 8.1D, 8.1E, 8.1F, 8.1G, 8.6A, 8.6B,8.7A,	**Volume** Students blend previous understandings of the volume of a prism with calculating the area of a circle to determine the volume of a cylinder in terms of its base area and height. As with previous grade level investigations of the volume of three-dimensional figures, students are expected to model the relationship between the volume of a cylinder and a cone having both congruent bases and heights. Students connect these models to the actual formulas for determining the volume of a cylinder and cone, which directly coincides with formulas used for determining the volume of prisms and pyramids on the STAAR Grade 8 Mathematics Reference Materials. Students solve problems involving the volume of cylinders, cones, and spheres.		

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