2025 Texas High School Aerospace Scholars
Middle School Math Course TEKS Overview

6th Grade Standard #	Standard
Proportionality 6.4(A)	Compare two rules verbally, numerically, graphically, and symbolically in form of y=ax or y=x+a to differentiate between additive and multiplicative relationships.
Expressions, equations, and relationships 6.6(C)	Represent a given situation using verbal descriptions, tables, graphs, and equations in the form y = kx or y = x + b.
Expressions, equations, and relationships 6.8(D)	Determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.
Measurement and Data 6.11(A)	Graph points in all four quadrants using ordered pairs of rational numbers.
7th Grade Standard #	**Standard**
Proportionality 7.4(B)	Calculate unit rates from rates in mathematical and real-world problems.
Proportionality 7.5(A)	Generalize the critical attributes of similarity, including ratios within and between similar shapes.
Proportionality 7.5(C)	Solve mathematical and real-world problems involving similar shape and scale drawings.
Expressions, equations, and relationships 7.7(A)	Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form y=mx+b.
Expressions, equations, and relationships 7.9(D)	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.
8th Grade Standard #	**Standard**
Proportionality 8.3(A)	Generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation.
Proportionality 8.3(C)	Use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation.
Proportionality 8.4(A)	Use similar right triangles to develop an understanding that slope, m, given as the rate comparing the change in y-values to the change in x-values, (y2 – y1)/(x2 – x1), is the same for any two points (x1, y1) and (x2, y2) on the same line.
Proportionality 8.4(C)	Use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems.
Proportionality 8.5(D)	Use a trend line that approximates the linear relationship between bivariate sets of data to make predictions.
Proportionality 8.5(H)	Identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems.
Expressions, equations, and relationships 8.7(B)	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.
Expressions, equations, and relationships 8.7(D)	Determine the distance between two points on a coordinate plane using the Pythagorean theorem.
Two-dimensional shapes 8.10(C)	Explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation.

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Geometry Standard #	Standard
Coordinate and transformational geometry G.2(A)	Determine the coordinates of a point that is a given fractional distance less than one from one end of a line segment to the other in one- and two-dimensional coordinate systems, including finding the midpoint.
Coordinate and transformational geometry G.2(B)	Derive and use the distance, slope, and midpoint formulas to verify geometric relationships, including congruence of segments.
Coordinate and transformational geometry G.3(A)	Describe and perform transformations of figures in a plane using coordinate notation.
Coordinate and transformational geometry G.3(B)	Determine the image or pre-image of a given two- dimensional figure under a composition of rigid transformations, a composition of non-rigid transformacons, and a composition of both, including dilations where the center can be any point in the plane.
Similarity, proof, and trigonometry G.7(A)	Apply the definition of similarity in terms of a dilation to identify similar figures and their proportional sides and the congruent corresponding angles.
Two-dimensional and three-dimensional figures G.11(C)	Apply the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.
Algebra Standard #	**Standard**
Linear functions, equations, and inequalities A.4(C)	Write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems.
Linear functions, equations, and inequalities A.3(B)	Calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in contents of mathematical and real-world problems.

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Lesson One --- 3, 2, 1…Lunch		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will engage in cooperative game play with other teams to simulate navigating an unmanned aerial vehicle (UAV) from a given start point to an end point with the shortest flight path while avoiding obstacles.	Students will work collaboratively to determine the shortest distance between two points on a coordinate plane by applying the Pythagorean Theorem.	• 8.7(D) Determine the distance between two points on a coordinate plane using the Pythagorean theorem. • G.2(A) Determine the coordinates of a point that is a given fractional distance less than one from one end of a line segment to the other in one- and two-dimensional coordinate systems, including finding the midpoint.
Lesson Two --- 3, 2, 1…Lunch: Transformations Adaptation		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will use a completed town map from the *3, 2, 1… Lunch! Activity* to create a new map through a series of transformations.	Students will utilize a series of translations, reflections, and/or rotations on coordinate plane to transform the layout of an existing town map.	• 8.10(C) Explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation. • G.3(A) Describe and perform transformations of figures in a plane using coordinate notation.
Lesson Three --- Flight Control Math		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will learn about Detect and Avoid (DAA), a collision avoidance technology, through this real-world math exercise. Given two points, students determine the slope of the line using similar right triangles to describe the movement.	Students will develop an understanding of slope as the rate of change between two points by using similar right triangles.	• 8.4(A) Use similar right triangles to develop an understanding that slope, m, given as the rate comparing the change in y-values to the change in x-values, $(y2 – y1)/(x2 – x1)$, is the same for any two points (x1, y1) and (x2, y2) on the same line. • 7.4(B) calculate unit rates from rates in mathematical and real-world problems. • A.3(B) Calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in contents of mathematical and real-world problems. • G.2(B) Derive and use the distance, slope, and midpoint formulas to verify geometric.

		relationships, including congruence of segments.
Lesson Four --- Graphing Global Temperatures		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will use global temperature data to create models that compare long-term trends. They will determine whether global temperature is rising based on the data and if the relationship between year and temperature increase is proportional or nonproportional.	Students will use spreadsheet software to graph historical climate data and identify a trendline. After completing their graph, students will determine whether their trendline is best described as proportional or nonproportional and why that might be.	• 6.4(A) Compare two rules verbally, numerically, graphically, and symbolically in form of y=ax or y=x+a to differentiate between additive and multiplicative relationships. • 8.5(H) Identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems.
Lesson Five --- Graphing Trending Lines		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will use sea-level rise data and/or global temperature data to create models and compare short-term trends to long-term trends. They will then make predictions about years after the data set and compare to current data.	Students will use a linear regression software to determine a line of best fit for a bivariate set of data and make predictions about future data points based on their line of best fit.	• 8.5(D) Use a trend line that approximates the linear relationship between bivariate sets of data to make predictions. • A.4(C) Write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems.
Lesson Six --- Lego CAD		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will understand surface area by using 3D modeling. This lesson integrates mathematical concepts with technology providing a hands-on engaging way for students to understand through real-world application.	Students will apply their knowledge of surface area to calculate lateral and total surface areas of rectangular prisms, and cylinders.	• 8.7(B) 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. • 6.8(D) Determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers. • 7.9(D) 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. • G.11(C) Apply the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.
Lesson Seven --- Planetary Pasta Rovers		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, using only pasta and glue, students must design a rover that will travel on a smooth, flat surface over a period of time. Students use the same engineering design process that JPL engineers use to improve their designs. Students will use their rovers to collect data to determine the rate of change and y intercept and interpret these values in the context of the situation.	Students will be able to calculate the rate of change and y-intercept of a data set that they created and interpret these values in the context of a real-world situation.	• 8.4(C) Use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems. • 6.6(C) Represent a given situation using verbal descriptions, tables, graphs, and equations in the form y = kx or y = x + b. • 7.7(A) Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form y=mx+b.
Lesson Eight --- Scale Factor		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will be introduced to the concept of dilations and scale factors through the relative sizes of planets and stars. They will begin their exploration by learning to calculate scale factors from images of the Asteroid Eros and a Mars Rover Landing site. Students will then extend their exploration by modeling the relative size of planets and stars on a coordinate plane.	Students will be able to calculate the scale factor of an image. Student will calculate and use scale factors to model objects in space and be able to explain the importance of scale in practical applications.	• 8.3(C) Use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation. • 6.11(A) Graph points in all four quadrants using ordered pairs of rational numbers. • 7.5(C) Solve mathematical and real-world problems involving similar shape and scale drawings. • G.3(B) Determine the image or pre-image of a given two- dimensional figure under a composition of rigid transformations, a composition of non-rigid transformations, and

		a composition of both, including dilations where the center can be any point in the plane.
Lesson Nine --- Shape Your Flight		
Lesson Overview	**Lesson Objective**	**TEKS:**
In this activity, students will build two differently sized paper airplanes and determine the scale of their similarity. After predicting whether the size of the airplane will impact its flight, students will test their planes and record their flight data. The lesson will conclude by discussing potential improvements to be made to future paper airplanes and evaluating student understanding of scale factors and similarity through a short exit ticket.	Students will build two paper airplanes and identify similar sides on both the triangular wings, as well as the ratio of the corresponding sides.	• 7.5(A) Generalize the critical attributes of similarity, including ratios within and between similar shapes. • 8.3(A) Generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation. • G.7(A) Apply the definition of similarity in terms of a dilation to identify similar figures and their proportional sides and the congruent corresponding angles.