STAAR® ALTERNATE 2

State of Texas Assessments of Academic Readiness

TEKS Curriculum Framework for STAAR Alternate 2

Grade 8 Mathematics Assessment

Updated Fall 2024

Note: This curriculum framework document has been updated to include the student expectations eligible for assessment on this STAAR Alternate 2 Mathematics test.

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STAAR Reporting Category 1 – Numerical Representations and Relationships: The student will demonstrate an understanding of how to represent and manipulate numbers and expressions.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.2) Number and operations. The student applies mathematical process standards to represent and use real numbers in a variety of forms. The student is expected to: (A) extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers; **Supporting Standard** (B) approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line; **Supporting Standard** (C) convert between standard decimal notation and scientific notation; **Supporting Standard** (D) order a set of real numbers arising from mathematical and real-world contexts. **Readiness Standard**	Recognizes or models relationships between different forms or sets of numbers.

8.2	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Determining and Simplifying Numeric and Algebraic Expressions • extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers (7) • generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties (6) • determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations (6) • distinguish between expressions and equations verbally, numerically, and algebraically (6) • generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization (6) • simplify numerical expressions that do not involve exponents, including up to two levels of grouping (5) • describe the meaning of parentheses and brackets in a numeric expression (5)

Continued

8.2	Prerequisite Skills/Links to TEKS Vertical Alignment

- represent the value of the digit in decimals through the thousandths using expanded notation and numerals (5)
- represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals (4)
- interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left (4)
- describe the mathematical relationships found in the base-10 place value system through the hundred thousands place (3)
- compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate (3)
- use standard, word, and expanded forms to represent numbers up to 1,200 (2)
- use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones (2)
- apply properties of operations to add and subtract two or three numbers (1)
- use objects, pictures, and expanded and standard forms to represent numbers up to 120 (1)
- use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones (1)
- compose and decompose numbers up to 10 with objects and pictures (K)
- begin to understand that numbers 0-10 can be composed and decomposed in various ways to represent a quantity (PK4.V.A.7)

Comparing, Ordering, and Rounding Numbers Using Place Value

- order a set of rational numbers arising from mathematical and real-world contexts (6)
- round decimals to tenths or hundredths (5)
- compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or = (5)
- compare and order decimals using concrete and visual models to the hundredths (4)
- round whole numbers to a given place value through the hundred thousands place (4)
- compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or = (4)
- compare and order whole numbers up to 100,000 and represent comparisons using the symbols >, <, or = (3)
- use an understanding of place value to determine the number that is 10 or 100 more or less than a given number up to 1,200 (2)

Continued

8.2	Prerequisite Skills/Links to TEKS Vertical Alignment

- use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (>, <, or =) (2)
- use relationships to determine the number that is 10 more and 10 less than a given number up to 120 (1)
- represent the comparison of two numbers to 100 using the symbols >, <, or = (1)
- order whole numbers up to 120 using place value and open number lines (1)
- use place value to compare whole numbers up to 120 using comparative language (1)
- use comparative language to describe two numbers up to 20 presented as written numerals (K)
- compare sets of objects up to at least 20 in each set using comparative language (K)
- compare sets of objects up to 10 using comparative language (e.g., greater/more than, less/fewer than, equal to/same number of) (PK4.V.A.8)
- compare sets of objects up to 5 using comparative language (e.g., more than, less than, same number of) (PK3.V.A.8)

Recognizing Numbers and Counting

- classify whole numbers, integers, rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers (6)
- identify prime and composite numbers (5)
- determine if a number is even or odd using divisibility rules (3)
- determine whether a number up to 40 is even or odd using pairings of objects to represent the number (2)
- generate a number that is greater than or less than a given whole number up to 1,200 (2)
- skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set (1)
- recite numbers forward and backward from any given number between 1 and 120 (1)
- generate a number that is greater than or less than a given whole number up to 120 (1)
- recognize instantly the quantity of structured arrangements (1)
- recite numbers up to at least 100 by ones and tens beginning with any given number (K)
- generate a number that is one more than or one less than another number up to at least 20 (K)
- generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20 (K)
- recognize instantly the quantity of a small group of objects in organized and random arrangements (K)

Continued

8.2	Prerequisite Skills/Links to TEKS Vertical Alignment
	• count a set of objects up to at least 20 and demonstrate that the last number said tells the number of objects in the set regardless of their arrangement or order (K) • read, write, and represent whole numbers from 0 to at least 20 with and without objects or pictures (K) • count forward and backward to at least 20 with and without objects (K) • represent quantities up to 10 (PK4.V.A.6) • recognize numerals 0-10 (PK4.V.A.5) • instantly recognize the quantity of up to 6 objects without counting (subitizes) (PK4.V.A.4) • count up to 10 items and demonstrate cardinality by communicating that the last number indicates how many items are in the set (PK4.V.A.3) • count up to 10 objects with one-to-one correspondence (PK4.V.A.2) • rote count from 1 to 30 (PK4.V.A.1) • represent quantities up to 5 (PK3.V.A.6) • recognize numerals 0-5 (PK3.V.A.5) • instantly recognize the quantity of up to 3 objects without counting (subitizes) (PK3.V.A.4) • count up to 5 items and demonstrate cardinality by communicating that the last number indicates how many items are in the set (PK3.V.A.3) • count up to 5 objects with one-to-one correspondence (PK3.V.A.2) • rote count from 1 to 10 (PK3.V.A.1)

STAAR Reporting Category 2 – Computations and Algebraic Relationships: The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.4) Proportionality. The student applies mathematical process standards to explain proportional and non-proportional relationships involving slope. The student is expected to: (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, $(y_2 - y_1)/(x_2 - x_1)$, is the same for any two points (x_1, y_1) and (x_2, y_2) on the same line; **Supporting Standard** (B) graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship; **Readiness Standard** (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. **Readiness Standard**	Determines the slope of a line or rate of change using a variety of methods.

8.4	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Representing and Solving Algebraic Relationships • determine if the given value(s) make(s) one-variable, two-step equations and inequalities true (7) • model and solve one-variable, two-step equations and inequalities (7) • write a corresponding real-world problem given a one-variable, two-step equation or inequality (7) • represent solutions for one-variable, two-step equations and inequalities on number lines (7) • write one-variable, two-step equations and inequalities to represent constraints or conditions within problems (7) • represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$ (7) • solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (7) • determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems (7) • calculate unit rates from rates in mathematical and real-world problems (7)

Continued

8.4	Prerequisite Skills/Links to TEKS Vertical Alignment
	• represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ (7) • determine if the given value(s) make(s) one-variable, one-step equations or inequalities true (6) • model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts (6) • write corresponding real-world problems given one-variable, one-step equations or inequalities (6) • represent solutions for one-variable, one-step equations and inequalities on number lines (6) • write one-variable, one-step equations and inequalities to represent constraints or conditions within problems (6) • represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ (6) • write an equation that represents the relationship between independent and dependent quantities from a table (6) • identify independent and dependent quantities from tables and graphs (6) • solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models (6) • represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions (6) • apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates (6) • compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships (6) • recognize the difference between additive and multiplicative numerical patterns given in a table or graph (5) • generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph (5) • represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5) • represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence (4) • represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity (4) • represent real-world relationships using number pairs in a table and verbal descriptions (3)

Continued

8.4	Prerequisite Skills/Links to TEKS Vertical Alignment
	• determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product (3) • represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations (3) • represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (3) • represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (2) • generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (2) • determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (1) • understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (1) • represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (1) • generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (1) • recognize, duplicate, extend, and create patterns (PK4.V.E.3) • recognize and duplicate patterns (PK3.V.E.3) *Representing and Using Fractions, Decimals, Percents and Probability* • represent ratios and percents with concrete models, fractions, and decimals (6) • give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients (6) • give examples of ratios as multiplicative comparisons of two quantities describing the same attribute (6)

STAAR Reporting Category 2 – Computations and Algebraic Relationships: The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.5) Proportionality. The student applies mathematical process standards to use proportional and non-proportional relationships to develop foundational concepts of functions. The student is expected to: (A) represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$; **Supporting Standard** (B) represent linear non-proportional situations with tables, graphs, and equations in the form of $y = mx + b$, where $b \neq 0$; **Supporting Standard** (E) solve problems involving direct variation; **Supporting Standard** (F) distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$; **Supporting Standard** (G) identify functions using sets of ordered pairs, tables, mappings, and graphs; **Readiness Standard** (H) identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems; **Supporting Standard** (I) write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations. **Readiness Standard**	Models or solves problems involving proportional or non-proportional relationships.
8.5	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Representing and Solving Algebraic Relationships • determine if the given value(s) make(s) one-variable, two-step equations and inequalities true (7) • model and solve one-variable, two-step equations and inequalities (7) • write a corresponding real-world problem given a one-variable, two-step equation or inequality (7) • represent solutions for one-variable, two-step equations and inequalities on number lines (7)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment
	• write one-variable, two-step equations and inequalities to represent constraints or conditions within problems (7) • represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$ (7) • solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (7) • determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems (7) • calculate unit rates from rates in mathematical and real-world problems (7) • represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ (7) • determine if the given value(s) make(s) one-variable, one-step equations or inequalities true (6) • model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts (6) • write corresponding real-world problems given one-variable, one-step equations or inequalities (6) • represent solutions for one-variable, one-step equations and inequalities on number lines (6) • write one-variable, one-step equations and inequalities to represent constraints or conditions within problems (6) • represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ (6) • write an equation that represents the relationship between independent and dependent quantities from a table (6) • identify independent and dependent quantities from tables and graphs (6) • solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models (6) • represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions (6) • apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates (6) • compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships (6) • recognize the difference between additive and multiplicative numerical patterns given in a table or graph (5) • generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph (5)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment
	• represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5) • represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence (4) • represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity (4) • represent real-world relationships using number pairs in a table and verbal descriptions (3) • determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product (3) • represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations (3) • represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (3) • represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (2) • generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (2) • determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (1) • understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (1) • represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (1) • generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (1) • recognize, duplicate, extend, and create patterns (PK4.V.E.3) • recognize and duplicate patterns (PK3.V.E.3)

STAAR Reporting Category 2 – Computations and Algebraic Relationships: The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.8) Expressions, equations, and relationships. The student applies mathematical process standards to use one-variable equations or inequalities in problem situations. The student is expected to: (A) write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants; **Supporting Standard** (B) write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants; **Supporting Standard** (C) model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants. **Readiness Standard**	Uses equations or inequalities to model and solve problems.

8.8	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Representing and Solving Algebraic Relationships • determine if the given value(s) make(s) one-variable, two-step equations and inequalities true (7) • model and solve one-variable, two-step equations and inequalities (7) • write a corresponding real-world problem given a one-variable, two-step equation or inequality (7) • represent solutions for one-variable, two-step equations and inequalities on number lines (7) • write one-variable, two-step equations and inequalities to represent constraints or conditions within problems (7) • represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$ (7) • solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (7) • determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems (7)

Continued

8.8	Prerequisite Skills/Links to TEKS Vertical Alignment
	• calculate unit rates from rates in mathematical and real-world problems (7) • represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ (7) • determine if the given value(s) make(s) one-variable, one-step equations or inequalities true (6) • model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts (6) • write corresponding real-world problems given one-variable, one-step equations or inequalities (6) • represent solutions for one-variable, one-step equations and inequalities on number lines (6) • write one-variable, one-step equations and inequalities to represent constraints or conditions within problems (6) • represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ (6) • write an equation that represents the relationship between independent and dependent quantities from a table (6) • identify independent and dependent quantities from tables and graphs (6) • solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models (6) • represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions (6) • apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates (6) • compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships (6) • recognize the difference between additive and multiplicative numerical patterns given in a table or graph (5) • generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph (5) • represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5) • represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence (4) • represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity (4) • represent real-world relationships using number pairs in a table and verbal descriptions (3)

Continued

8.8	Prerequisite Skills/Links to TEKS Vertical Alignment
	• determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product (3) • represent and solve one-and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations (3) • represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (3) • represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (2) • generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (2) • determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (1) • understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (1) • represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (1) • generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (1) • recognize, duplicate, extend, and create patterns (PK4.V.E.3) • recognize and duplicate patterns (PK3.V.E.3)

STAAR Reporting Category 2 – Computations and Algebraic Relationships: The student will demonstrate an understanding of how to perform operations and represent algebraic relationships.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.9) Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to develop foundational concepts of simultaneous linear equations. The student is expected to: (A) identify and verify 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. **Supporting Standard**	Identifies solutions to pairs of linear equations.

8.9	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Representing and Solving Algebraic Relationships • determine if the given value(s) make(s) one-variable, two-step equations and inequalities true (7) • model and solve one-variable, two-step equations and inequalities (7) • write a corresponding real-world problem given a one-variable, two-step equation or inequality (7) • represent solutions for one-variable, two-step equations and inequalities on number lines (7) • write one-variable, two-step equations and inequalities to represent constraints or conditions within problems (7) • represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$ (7) • solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (7) • determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems (7) • calculate unit rates from rates in mathematical and real-world problems (7) • represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ (7) • determine if the given value(s) make(s) one-variable, one-step equations or inequalities true (6) • model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts (6)

Continued

8.9	Prerequisite Skills/Links to TEKS Vertical Alignment
	• write corresponding real-world problems given one-variable, one-step equations or inequalities (6) • represent solutions for one-variable, one-step equations and inequalities on number lines (6) • write one-variable, one-step equations and inequalities to represent constraints or conditions within problems (6) • represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ (6) • write an equation that represents the relationship between independent and dependent quantities from a table (6) • identify independent and dependent quantities from tables and graphs (6) • solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models (6) • represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions (6) • apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates (6) • compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships (6) • recognize the difference between additive and multiplicative numerical patterns given in a table or graph (5) • generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph (5) • represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5) • represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence (4) • represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity (4) • represent real-world relationships using number pairs in a table and verbal descriptions (3) • determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product (3) • represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations (3) • represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (3)

Continued

8.9	Prerequisite Skills/Links to TEKS Vertical Alignment
	• represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (2) • generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (2) • determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (1) • understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (1) • represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (1) • generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (1) • recognize, duplicate, extend, and create patterns (PK4.V.E.3) • recognize and duplicate patterns (PK3.V.E.3)

STAAR Reporting Category 3 – Geometry and Measurement: The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.3) Proportionality. The student applies mathematical process standards to use proportional relationships to describe dilations. The student is expected to: (A) generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation; **Supporting Standard** (B) compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane; **Supporting Standard** (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. **Readiness Standard**	Uses ratios, expressions, or equations to show relationships between similar geometric figures.

8.3	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Using Similarity and Transformational Geometry • solve mathematical and real-world problems involving similar shape and scale drawings (7) • describe π as the ratio of the circumference of a circle to its diameter (7) • generalize the critical attributes of similarity, including ratios within and between similar shapes (7) • recognize common shapes, regardless of orientation and size (PK4.V.C.4) • recognize common shapes, regardless of size (PK3.V.C.4) *Identifying and Using Attributes of Geometric Figures* • classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties (5) • classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size (4) • apply knowledge of right angles to identify acute, right, and obtuse triangles (4) • identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure (4)

Continued

8.3	Prerequisite Skills/Links to TEKS Vertical Alignment
	• identify points, lines, line segments, rays, angles, and perpendicular and parallel lines (4) • use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories (3) • classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language (3) • decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts (2) • compose two-dimensional shapes and three-dimensional solids with given properties or attributes (2) • classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices (2) • classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language (2) • create two-dimensional shapes based on given attributes, including number of sides and vertices (2) • compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible (1) • identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language (1) • identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language (1) • create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons (1) • distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape (1) • classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language (1) • create two-dimensional shapes using a variety of materials and drawings (K) • classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size (K) • identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably (K) • identify two-dimensional components of three-dimensional objects (K) • identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world (K) *Continued*

8.3	Prerequisite Skills/Links to TEKS Vertical Alignment
	• identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles (K) • create shapes using materials and/or manipulatives (PK4.V.C.2) • name and describe common 2D shapes and name at least 1 solid 3D shape (PK4.V.C.1) • attempt to create shapes using materials and/or manipulatives (PK3.V.C.2) • name and describe common 2D shapes (PK3.V.C.1)

STAAR Reporting Category 3 – Geometry and Measurement: The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.6) Expressions, equations, and relationships. The student applies mathematical process standards to develop mathematical relationships and make connections to geometric formulas. The student is expected to: (A) describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height; **Supporting Standard** (C) use models and diagrams to explain the Pythagorean theorem. **Supporting Standard**	Identifies or models the relationships that are found in geometric formulas.

8.6	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Measuring Length, Area, Volume, and Weight/Mass • 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 (7) • determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles (7) • determine the circumference and area of circles (7) • solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids (7) • use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas (7) • explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas (7) • model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas (7) • convert between measurement systems, including the use of proportions and the use of unit rates (7) • 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 (6)

Continued

8.6	Prerequisite Skills/Links to TEKS Vertical Alignment
	• write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers (6) • model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes (6) • convert units within a measurement system, including the use of proportions and unit rates (6) • solve problems by calculating conversions within a measurement system, customary or metric (5) • determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base (5) • recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (*n* cubic units) needed to fill it with no gaps or overlaps if possible (5) • represent and solve problems related to perimeter and/or area and related to volume (5) • use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$) (5) • solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate (4) • convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table (4) • identify relative sizes of measurement units within the customary and metric systems (4) • solve problems related to perimeter and area of rectangles where dimensions are whole numbers (4) • use models to determine the formulas for the perimeter of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$) (4) • determine liquid volume (capacity) or weight using appropriate units and tools (3) • determine when it is appropriate to use measurements of liquid volume (capacity) or weight (3) • determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems (3) • decompose two congruent two-dimensional figures into parts with equal areas and express the area of each part as a unit fraction of the whole and recognize that equal shares of identical wholes need not have the same shape (3) • decompose composite figures formed by rectangles into non-overlapping rectangles to determine the area of the original figure using the additive property of area (3) *Continued*

8.6	Prerequisite Skills/Links to TEKS Vertical Alignment
	• determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row (3) • use concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit (2) • determine a solution to a problem involving length, including estimating lengths (2) • determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes (2) • describe the inverse relationship between the size of the unit and the number of units needed to equal the length of an object (2) • find the length of objects using concrete models for standard units of length (2) • describe a length to the nearest whole unit using a number and a unit (1) • measure the same object/distance with units of two different lengths and describe how and why the measurements differ (1) • illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other (1) • use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement (1) • compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference (K) • give an example of a measurable attribute of a given object, including length, capacity, and weight (K) • recognize and compare weights of objects (PK4.V.D.3) • recognize and compare capacity based on how much space exists within an object (PK4.V.D.2) • recognize and compare heights or lengths of people or objects (PK4.V.D.1) • understand that weights of objects can vary and be compared (PK3.V.D.3) • begin to recognize capacity based on how much space exists within an object (PK3.V.D.2) • understand that lengths of objects can vary and be compared (PK3.V.D.1)

STAAR Reporting Category 3 – Geometry and Measurement: The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.7) Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to solve problems. The student is expected to: (A) solve problems involving the volume of cylinders, cones, and spheres; **Readiness Standard** (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; **Readiness Standard** (C) use the Pythagorean theorem and its converse to solve problems; **Readiness Standard** (D) determine the distance between two points on a coordinate plane using the Pythagorean theorem. **Supporting Standard**	Solves problems involving length, area, or volume, of geometric figures, or involving distance on a coordinate plane.

8.7	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Measuring Length, Area, Volume, and Weight/Mass • 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 (7) • determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles (7) • determine the circumference and area of circles (7) • solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids (7) • use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas (7) • explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas (7)

Continued

8.7	Prerequisite Skills/Links to TEKS Vertical Alignment
	• model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas (7) • convert between measurement systems, including the use of proportions and the use of unit rates (7) • 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 (6) • write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers (6) • model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes (6) • convert units within a measurement system, including the use of proportions and unit rates (6) • solve problems by calculating conversions within a measurement system, customary or metric (5) • determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base (5) • recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (*n* cubic units) needed to fill it with no gaps or overlaps if possible (5) • represent and solve problems related to perimeter and/or area and related to volume (5) • use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$) (5) • solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate (4) • convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table (4) • identify relative sizes of measurement units within the customary and metric systems (4) • solve problems related to perimeter and area of rectangles where dimensions are whole numbers (4) • use models to determine the formulas for the perimeter of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$) (4) • determine liquid volume (capacity) or weight using appropriate units and tools (3) • determine when it is appropriate to use measurements of liquid volume (capacity) or weight (3)

Continued

8.7	Prerequisite Skills/Links to TEKS Vertical Alignment
	• determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems (3) • decompose two congruent two-dimensional figures into parts with equal areas and express the area of each part as a unit fraction of the whole and recognize that equal shares of identical wholes need not have the same shape (3) • decompose composite figures formed by rectangles into non-overlapping rectangles to determine the area of the original figure using the additive property of area (3) • determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row (3) • use concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit (2) • determine a solution to a problem involving length, including estimating lengths (2) • determine the length of an object to the nearest marked unit using rulers, yardsticks, meter sticks, or measuring tapes (2) • describe the inverse relationship between the size of the unit and the number of units needed to equal the length of an object (2) • find the length of objects using concrete models for standard units of length (2) • describe a length to the nearest whole unit using a number and a unit (1) • measure the same object/distance with units of two different lengths and describe how and why the measurements differ (1) • illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other (1) • use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement (1) • compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference (K) • give an example of a measurable attribute of a given object, including length, capacity, and weight (K) • recognize and compare weights of objects (PK4.V.D.3) • recognize and compare capacity based on how much space exists within an object (PK4.V.D.2) • recognize and compare heights or lengths of people or objects (PK4.V.D.1) • understand that weights of objects can vary and be compared (PK3.V.D.3) • begin to recognize capacity based on how much space exists within an object (PK3.V.D.2) • understand that lengths of objects can vary and be compared (PK3.V.D.1)

Continued

8.7	Prerequisite Skills/Links to TEKS Vertical Alignment
	Identifying Points and Distances on Number Lines • locate, compare, and order integers and rational numbers using a number line (6) • identify a number, its opposite, and its absolute value (6) • represent fractions and decimals to the tenths or hundredths as distances from zero on a number line (4) • determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line (4) • represent fractions of halves, fourths, and eighths as distances from zero on a number line (3) • explain that two fractions are equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model (3) • determine the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line (3) • represent a number on a number line as being between two consecutive multiples of 10; 100; 1,000; or 10,000 and use words to describe relative size of numbers in order to round whole numbers (3) • represent whole numbers as distances from any given location on a number line (2) • name the whole number that corresponds to a specific point on a number line (2) • locate the position of a given whole number on an open number line (2) • demonstrate use of position words (PK4.V.C.3) • begin to use language to describe position of objects (PK3.V.C.3) *Graphing on the Coordinate Plane* • graph points in all four quadrants using ordered pairs of rational numbers (6) • graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table (5) • describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane (5) • describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0,0). The *x*-coordinate, the first number in an ordered pair, indicates movement parallel to the *x*-axis starting at the origin. The *y*-coordinate, the second number, indicates movement parallel to the *y*-axis starting at the origin (5)

STAAR Reporting Category 3 – Geometry and Measurement: The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.8) Expressions, equations, and relationships. The student applies mathematical process standards to use one-variable equations or inequalities in problem situations. The student is expected to: (D) 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. **Supporting Standard**	Recognizes angle relationships in geometric figures.

8.8 Prerequisite Skills/Links to TEKS Vertical Alignment

Measuring Angles and Using Angle Relationships

- write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships (7)
- extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle (6)
- determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures (4)
- draw an angle with a given measure (4)
- determine the approximate measures of angles in degrees to the nearest whole number using a protractor (4)
- illustrate degrees as the units used to measure an angle, where 1/360 of any circle is one degree and an angle that "cuts" *n*/360 out of any circle whose center is at the angle's vertex has a measure of *n* degrees. Angle measures are limited to whole numbers (4)
- illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers (4)

Representing and Solving Algebraic Relationships

- represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5)

Continued

8.8	Prerequisite Skills/Links to TEKS Vertical Alignment

Identifying and Using Attributes of Geometric Figures

- classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties (5)
- classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size (4)
- apply knowledge of right angles to identify acute, right, and obtuse triangles (4)
- identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure (4)
- identify points, lines, line segments, rays, angles, and perpendicular and parallel lines (4)
- use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories (3)
- classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language (3)
- decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts (2)
- compose two-dimensional shapes and three-dimensional solids with given properties or attributes (2)
- classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices (2)
- classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language (2)
- create two-dimensional shapes based on given attributes, including number of sides and vertices (2)
- compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible (1)
- identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language (1)
- identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language (1)
- create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons (1)
- distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape (1)

Continued

8.8	Prerequisite Skills/Links to TEKS Vertical Alignment
	• classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language (1) • create two-dimensional shapes using a variety of materials and drawings (K) • classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size (K) • identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably (K) • identify two-dimensional components of three-dimensional objects (K) • identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world (K) • identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles (K) • create shapes using materials and/or manipulatives (PK4.V.C.2) • name and describe common 2D shapes and name at least 1 solid 3D shape (PK4.V.C.1) • attempt to create shapes using materials and/or manipulatives (PK3.V.C.2) • name and describe common 2D shapes (PK3.V.C.1)

STAAR Reporting Category 3 – Geometry and Measurement: The student will demonstrate an understanding of how to represent and apply geometry and measurement concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.10) Two-dimensional shapes. The student applies mathematical process standards to develop transformational geometry concepts. The student is expected to: (A) generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane; **Supporting Standard** (B) differentiate between transformations that preserve congruence and those that do not; **Supporting Standard** (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; **Readiness Standard** (D) model the effect on linear and area measurements of dilated two-dimensional shapes. **Supporting Standard**	Identifies or compares transformations.

8.10 Prerequisite Skills/Links to TEKS Vertical Alignment

Using Similarity and Transformational Geometry

- solve mathematical and real-world problems involving similar shape and scale drawings (7)
- describe π as the ratio of the circumference of a circle to its diameter (7)
- generalize the critical attributes of similarity, including ratios within and between similar shapes (7)
- recognize common shapes, regardless of orientation and size (PK4.V.C.4)
- recognize common shapes, regardless of size (PK3.V.C.4)

Identifying and Using Attributes of Geometric Figures

- classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties (5)
- classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size (4)

Continued

8.10	Prerequisite Skills/Links to TEKS Vertical Alignment
	• apply knowledge of right angles to identify acute, right, and obtuse triangles (4) • identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure (4) • identify points, lines, line segments, rays, angles, and perpendicular and parallel lines (4) • use attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and draw examples of quadrilaterals that do not belong to any of these subcategories (3) • classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language (3) • decompose two-dimensional shapes such as cutting out a square from a rectangle, dividing a shape in half, or partitioning a rectangle into identical triangles and identify the resulting geometric parts (2) • compose two-dimensional shapes and three-dimensional solids with given properties or attributes (2) • classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices (2) • classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language (2) • create two-dimensional shapes based on given attributes, including number of sides and vertices (2) • compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible (1) • identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language (1) • identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons, and describe their attributes using formal geometric language (1) • create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons (1) • distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape (1) • classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language (1) • create two-dimensional shapes using a variety of materials and drawings (K) • classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size (K) • identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably (K) *Continued*

8.10	Prerequisite Skills/Links to TEKS Vertical Alignment
	• identify two-dimensional components of three-dimensional objects (K) • identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world (K) • identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles (K) • create shapes using materials and/or manipulatives (PK4.V.C.2) • name and describe common 2D shapes and name at least 1 solid 3D shape (PK4.V.C.1) • attempt to create shapes using materials and/or manipulatives (PK3.V.C.2) • name and describe common 2D shapes (PK3.V.C.1) *Graphing on the Coordinate Plane* • graph points in all four quadrants using ordered pairs of rational numbers (6) • graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table (5) • describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane (5) • describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0,0). The *x*-coordinate, the first number in an ordered pair, indicates movement parallel to the *x*-axis starting at the origin. The *y*-coordinate, the second number, indicates movement parallel to the *y*-axis starting at the origin (5)

STAAR Reporting Category 4 – Data Analysis and Personal Financial Literacy: The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.5) Proportionality. The student applies mathematical process standards to use proportional and non-proportional relationships to develop foundational concepts of functions. The student is expected to: (C) contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation; **Supporting Standard** (D) use a trend line that approximates the linear relationship between bivariate sets of data to make predictions. **Readiness Standard**	Compares or interprets linear and non-linear data.

8.5	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Collecting and Representing Data • summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution (6) • summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution (6) • use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution (6) • represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots (6) • represent discrete paired data on a scatterplot (5) • represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots (5) • represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions (4) • summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals (3) • organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more (2)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment

- explain that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category (2)
- use data to create picture and bar-type graphs (1)
- collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts (1)
- use data to create real-object and picture graphs (K)
- collect, sort, and organize data into two or three categories (K)
- collect data and organize it in a graphic representation (PK4.V.E.2)
- sort objects that are the same and different into groups and use language to describe how the groups are similar and different (PK4.V.E.1)
- participate in group activities of collecting data and organizing it into graphic representations (PK3.V.E.2)
- sort objects that are the same and different (PK3.V.E.1)

Using Data

- compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations (7)
- use data from a random sample to make inferences about a population (7)
- compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads (7)
- solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents (7)
- distinguish between situations that yield data with and without variability (6)
- interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots (6)
- solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot (5)
- solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot (4)
- solve one- and two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals (3)
- draw conclusions and make predictions from information in a graph (2)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment

- write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one (2)
- draw conclusions and generate and answer questions using information from picture and bar-type graphs (1)
- draw conclusions from real-object and picture graphs (K)

Representing and Solving Algebraic Relationships

- determine if the given value(s) make(s) one-variable, two-step equations and inequalities true (7)
- model and solve one-variable, two-step equations and inequalities (7)
- write a corresponding real-world problem given a one-variable, two-step equation or inequality (7)
- represent solutions for one-variable, two-step equations and inequalities on number lines (7)
- write one-variable, two-step equations and inequalities to represent constraints or conditions within problems (7)
- represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$ (7)
- solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems (7)
- determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems (7)
- calculate unit rates from rates in mathematical and real-world problems (7)
- represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ (7)
- determine if the given value(s) make(s) one-variable, one-step equations or inequalities true (6)
- model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts (6)
- write corresponding real-world problems given one-variable, one-step equations or inequalities (6)
- represent solutions for one-variable, one-step equations and inequalities on number lines (6)
- write one-variable, one-step equations and inequalities to represent constraints or conditions within problems (6)
- represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ (6)
- write an equation that represents the relationship between independent and dependent quantities from a table (6)
- identify independent and dependent quantities from tables and graphs (6)
- solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models (6)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment
	• represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions (6) • apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates (6) • compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships (6) • recognize the difference between additive and multiplicative numerical patterns given in a table or graph (5) • generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph (5) • represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity (5) • represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence (4) • represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity (4) • represent real-world relationships using number pairs in a table and verbal descriptions (3) • determine the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product (3) • represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations (3) • represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations (3) • represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem (2) • generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000 (2) • determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation (1) • understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s) (1)

Continued

8.5	Prerequisite Skills/Links to TEKS Vertical Alignment
	• represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences (1) • generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20 (1) • recognize, duplicate, extend, and create patterns (PK4.V.E.3) • recognize and duplicate patterns (PK3.V.E.3)

STAAR Reporting Category 4 – Data Analysis and Personal Financial Literacy: The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.11) Measurement and data. The student applies mathematical process standards to use statistical procedures to describe data. The student is expected to: (A) construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data; **Supporting Standard** (B) determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points. **Supporting Standard**	Determines the association between graphed data.

8.11 Prerequisite Skills/Links to TEKS Vertical Alignment

Collecting and Representing Data

- summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution (6)
- summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution (6)
- use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution (6)
- represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots (6)
- represent discrete paired data on a scatterplot (5)
- represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots (5)
- represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions (4)
- summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals (3)
- organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more (2)

Continued

8.11	Prerequisite Skills/Links to TEKS Vertical Alignment

- explain that the length of a bar in a bar graph or the number of pictures in a pictograph represents the number of data points for a given category (2)
- use data to create picture and bar-type graphs (1)
- collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts (1)
- use data to create real-object and picture graphs (K)
- collect, sort, and organize data into two or three categories (K)
- collect data and organize it in a graphic representation (PK4.V.E.2)
- sort objects that are the same and different into groups and use language to describe how the groups are similar and different (PK4.V.E.1)
- participate in group activities of collecting data and organizing it into graphic representations (PK3.V.E.2)
- sort objects that are the same and different (PK3.V.E.1)

Using Data

- compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations (7)
- use data from a random sample to make inferences about a population (7)
- compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads (7)
- solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents (7)
- distinguish between situations that yield data with and without variability (6)
- interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots (6)
- solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot (5)
- solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot (4)
- solve one- and two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals (3)
- draw conclusions and make predictions from information in a graph (2)

Continued

8.11	Prerequisite Skills/Links to TEKS Vertical Alignment
	• write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one (2) • draw conclusions and generate and answer questions using information from picture and bar-type graphs (1) • draw conclusions from real-object and picture graphs (K)

STAAR Reporting Category 4 – Data Analysis and Personal Financial Literacy: The student will demonstrate an understanding of how to represent and analyze data and how to describe and apply personal financial concepts.	
TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations	**STAAR Alternate 2 Essence Statement**
(8.12) Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to: (A) solve real-world problems comparing how interest rate and loan length affect the cost of credit; **Supporting Standard** (C) explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time; **Supporting Standard** (D) calculate and compare simple interest and compound interest earnings; **Readiness Standard** (G) estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college. **Supporting Standard**	Compares the results of borrowing or investing money.

8.12	**Prerequisite Skills/Links to TEKS Vertical Alignment**
	Managing Finances • analyze and compare monetary incentives, including sales, rebates, and coupons (7) • calculate and compare simple interest and compound interest earnings (7) • use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student's city or another large city nearby (7) • create and organize a financial assets and liabilities record and construct a net worth statement (7) • identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget (7) • describe the value of credit reports to borrowers and to lenders (6) • describe the information in a credit report and how long it is retained (6)

Continued

8.12	Prerequisite Skills/Links to TEKS Vertical Alignment
	• explain why it is important to establish a positive credit history (6) • balance a check register that includes deposits, withdrawals, and transfers (6) • distinguish between debit cards and credit cards (6) • compare the features and costs of a checking account and a debit card offered by different local financial institutions (6) • balance a simple budget (5) • describe actions that might be taken to balance a budget when expenses exceed income (5) • develop a system for keeping and using financial records (5) • identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments (5) • describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending (4) • describe how to allocate a weekly allowance among spending; saving, including for college; and sharing (4) • compare the advantages and disadvantages of various savings options (4) • calculate profit in a given situation (4) • identify decisions involving income, spending, saving, credit, and charitable giving (3) • list reasons to save and explain the benefit of a savings plan, including for college (3) • explain that credit is used when wants or needs exceed the ability to pay and that it is the borrower's responsibility to pay it back to the lender, usually with interest (3) • identify the costs and benefits of planned and unplanned spending decisions (3) • describe the relationship between the availability or scarcity of resources and how that impacts cost (3) • differentiate between producers and consumers and calculate the cost to produce a simple item (2) • identify examples of lending and use concepts of benefits and costs to evaluate lending decisions (2) • identify examples of borrowing and distinguish between responsible and irresponsible borrowing (2) • distinguish between a deposit and a withdrawal (2) • explain that saving is an alternative to spending (2) • calculate how money saved can accumulate into a larger amount over time (2) • consider charitable giving (1) • distinguish between spending and saving (1)

Continued

8.12	Prerequisite Skills/Links to TEKS Vertical Alignment
	Understanding the Connections Among Income, Expenses, and Careers • calculate the sales tax for a given purchase and calculate income tax for earned wages (7) • compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income (6) • explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study (6) • explain the difference between gross income and net income (5) • define income tax, payroll tax, sales tax, and property tax (5) • distinguish between fixed and variable expenses (4) • explain the connection between human capital/labor and income (3) • identify income as a means of obtaining goods and services, oftentimes making choices between wants and needs (1) • define money earned as income (1) • distinguish between wants and needs and identify income as a source to meet one's wants and needs (K) • list simple skills required for jobs (K) • differentiate between money received as income and money received as gifts (K) • identify ways to earn income (K) *Determining Values of Coins and Bills* • determine the value of a collection of coins and bills (3) • use the cent symbol, dollar sign, and the decimal point to name the value of a collection of coins (2) • determine the value of a collection of coins up to one dollar (2) • use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes (1) • write a number with the cent symbol to describe the value of a coin (1) • identify U.S. coins, including pennies, nickels, dimes, and quarters, by value and describe the relationships among them (1) • identify U.S. coins by name, including pennies, nickels, dimes, and quarters (K)

Mathematical Process Standards – Mathematical process standards will not be listed under a separate reporting category. Instead, they will be incorporated into test questions across reporting categories since the application of mathematical process standards is part of each knowledge statement.

TEKS Knowledge and Skills Statement/ STAAR-Tested Student Expectations

(8.1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace;

(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

(E) create and use representations to organize, record, and communicate mathematical ideas;

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

8.1	Prerequisite Skills/Links to TEKS Vertical Alignment
	• display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication (K-Alg) • analyze mathematical relationships to connect and communicate mathematical ideas (K-Alg) • create and use representations to organize, record, and communicate mathematical ideas (K-Alg) • communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate (K-Alg) • select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems (K-Alg) • use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution (K-Alg) • apply mathematics to problems arising in everyday life, society, and the workplace (K-Alg)