1 Thinking Proportionally

Module Pacing: 31 Days

Topic 1: Circles and Ratios

ELPS: 1.A, 1.C, 1.E, 1.F, 1.G, 2.C, 2.E, 2.I, 3.D, 3.E, 4.B, 4.C, 4.D, 4.J, 5.B, 5.F, 5.G

Topic Pacing: 9 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Pi: The Ultimate Ratio** Exploring the Ratio of Circle Circumference to Diameter	Students explore the relationship between the distance around a circle and the distance across a circle. They learn the terms *circumference, diameter,* and *radius*. Students use hands-on tools to measure the distance around a circle and the length of its diameter. They write a ratio of the circle's circumference to its diameter, and they compare their data to the data of their peers. They then use a compass to create their own circles and realize that for every circle, the ratio of circumference to diameter is pi. Students practice solving for the diameter or the circumference in problems.	• The *circumference* of a circle is the distance around the circle. • The ratio of the circumference of a circle to the diameter of a circle is approximately 3.14 or *pi*. • The formula for calculating the circumference of a circle is $C = d\pi$ or $C = 2\pi r$, where C is the circumference of a circle, d is the length of the diameter of the circle, r is the length of the radius of the circle, and π is represented using the approximation 3.14.	7.5B 7.8C **7.9B**	2
2	**That's a Spicy Pizza!** Area of Circles	Students explore the area of a circle in terms of its circumference. They cut a circle into sectors and fit the sectors together to form a parallelogram. The parallelogram helps students see the area of a circle in relation to its circumference: $A = \left(\frac{1}{2}C\right)r$. Students derive the area for a circle and then solve problems using the formulas for the circumference and area of circles.	• If a circle is divided into equal parts, separated, and rearranged to resemble a parallelogram, the area of a circle can be approximated by using the formula for the area of a parallelogram with a base length equal to half the circumference and a height equal to the radius. • The formula for calculating the area of a circle is $A = \pi r^2$, where A is the area of a circle, r is the length of the radius of the circle, and π is represented using the approximation 3.14. • When solving problems involving circles, the circumference formula is used to determine the distance around a circle, while the area formula is used to determine the amount of space contained inside a circle.	7.4B 7.8C **7.9B**	2
3	**Circular Reasoning** Solving Area and Circumference Problems	Students use the area of a circle formula and the circumference formula to solve for unknown measurements in problem situations. Some of the situations are problems composed of more than one figure, and some of the situations include shaded and non-shaded regions. Students then determine whether to use the circumference or area formula to solve problems involving circles.	• The formula to calculate the area of a circle is $A = \pi r^2$. • The formula to calculate the circumference of a circle is $C = 2\pi r$. • Composite figures that include circles are used to solve for unknowns.	**7.9B** **7.9C**	2
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					2

Topic 2: Fractional Rates

ELPS: 1.A, 1.C, 1.E, 1.F, 1.G, 2.C, 2.E, 2.I, 3.D, 3.E, 4.B, 4.C, 4.D, 4.J, 5.B, 5.F, 5.G

Topic Pacing: 8 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Making Punch** Unit Rate Representations	In this lesson, students recall the concepts of ratio and unit rate and how to represent these mathematical objects using tables and graphs. Students use the unit rate as a measure of a qualitative characteristic: the strength of the lemon-lime taste of a punch recipe. They represent this measure in tables and graphs and with fractions in the numerator.	• A rate is a ratio that compares two quantities that are measured in different units. • A unit rate is a comparison of two measurements in which the denominator has a value of one unit. • Tables are used to represent equivalent ratios. • Graphs can be used to represent rates.	7.4B	1
2	**Eggzactly!** Solving Problems with Ratios of Fractions	In this lesson, students determine ratios and write rates, including complex ratios and rates. Students will write proportions and use rates to determine miles per hour. They use common conversions to convert between the customary and metric measurement systems using unit rates and proportions. They will scale up and scale down to determine unknown quantities.	• A *complex ratio* has a fractional numerator or denominator (or both). • Complex ratios and rates can be used to solve problems. • Unit rates and proportions can be used to convert between measurement systems.	7.4B 7.4E	2
3	**Tagging Sharks** Solving Proportions Using Means and Extremes	Students solve several proportions embedded in real-world contexts. The term *variable* is introduced to represent an unknown quantity. Several proportions that contain one variable are solved using one of three methods: the scaling method, the unit rate method, and the means and extremes method. Students learn to isolate a variable in a proportion by using inverse operations.	• A *variable* is a letter or symbol used to represent a number. • To *solve a proportion* means to determine all the values of the variables that make the proportion true. • A method for solving a proportion called the scaling method involves multiplying (scaling up) or dividing (scaling down) the numerator and denominator of one ratio by the same factor until the denominators of both ratios are the same number. • A method for solving a proportion called the unit rate method involves changing one ratio to a unit rate and then scaling up to the rate you need. • A method for solving a proportion called the means and extremes method involves identifying the *means* and *extremes*, and then setting the product of the means equal to the product of the extremes to solve for the unknown quantity. • Isolating a variable involves performing an operation, or operations, to get the variable by itself on one side of the equals sign. • *Inverse operations* are operations that undo each other such as multiplication and division, or addition and subtraction.	7.4C **7.4D**	2
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					2

Topic 3: Proportionality

ELPS: 1.A, 1.C, 1.E, 1.F, 1.G, 2.C, 2.E, 2.I, 3.D, 3.E, 4.B, 4.C, 4.D, 4.J, 5.B, 5.F, 5.G

Topic Pacing: 14 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**How Does Your Garden Grow?** Proportional Relationships	Students explore tables and graphs that illustrate proportional relationships. First, students review equivalent ratios and the fact that the graphs of equivalent ratios form straight lines that pass through the origin. They are then given three sets of scenarios, equations, and graphs to match, using any strategy. Each group illustrates a different type of relationship: linear and proportional, linear and non-proportional, and non-linear. Students classify the groups of representations as linear and non-linear and use tables of values to classify the linear relationships as proportional or as non-proportional. They summarize the relationships between the terms *linear relationship, proportional relationship,* and *equivalent ratios*. Students are then given three new situations to analyze. They create tables of values and graphs and determine if a proportional relationship exists between two quantities. Finally, the term *direct variation* is introduced and explored using multiple representations.	• Graphs of equivalent ratios form a straight line that passes through the *origin*. • Linear relationships are also proportional relationships if the ratio between corresponding values of the quantities is constant. • The graph of a *proportional relationship* is a straight line that passes through the origin. • A linear relationship represents a *direct variation* if the ratio between the output values and input values is constant. The quantities are said to vary directly. • Multiple representations such as tables and graphs are used to show examples of proportional, or direct variation, relationships between two values within the context of real-world problems.	**7.4A** 7.4C	3
2	**Complying with Title IX** Constant of Proportionality	Students learn how to use equations to represent proportional relationships. Students write constants of proportionality based on the direction of the proportional relationship. They then use a scenario to set up a proportion and write two different equations for the scenario, depending on the direction of the proportional relationship. Students identify and interpret the constant of proportionality in the context of a scenario and solve problems using the equations that represent the proportional relationship. Next, students consider an additional situation in which the constant of proportionality and the corresponding equation depend on the question asked. They use the constants of proportionality to write equations, express the equations in terms of proportional relationships, and generalize the equation for proportional relationships. Students then practice using the constant of proportionality to solve for unknown quantities.	• In a proportional relationship, the ratio between two quantities is always the same. It is called the *constant of proportionality*. • The constant of proportionality in a proportional relationship is the ratio of the outputs to the inputs. • In a proportional relationship, two different proportional equations can be written. The coefficients, or constants of proportionality, in the two equations are reciprocals. • The equation used to represent the proportional relationship between two values is $y = kx$, where x and y are the quantities that vary, and k is the constant of proportionality. • Proportional relationships are used to write equations and solve for unknown values.	**7.4A** 7.4C **7.4D**	**2**
	Mid-Topic Assessment				**0**

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**Fish-Inches** Identifying the Constant of Proportionality in Graphs	In this lesson, students analyze proportional and non-proportional real-world and mathematical situations that are represented on graphs. When appropriate, they then identify the constant of proportionality. Students write equations to represent the situations from the graphs. Throughout the lesson, students interpret the meaning of points on graphs in terms of a proportional relationship, including the meaning of (1, *y*) and (0, 0).	• The graph of two variables that are proportional, or that vary directly, is a line that passes through the origin, (0, 0). • The ratio of the *y*-coordinate to the *x*-coordinate (their quotient) for any point is equivalent to the constant of proportionality, *k*, when analyzing a graph of two variables that are proportional. • When analyzing the graph of two variables that are not proportional, the ratios of the *y*-coordinate to the *x*-coordinate for any points are not equivalent.	**7.4A** 7.4C **7.4D**	2
4	**Minding Your Ps and Qs** Constant of Proportionality in Multiple Representations	Students use proportional relationships to create equivalent multiple representations, such as diagrams, equations, tables, and graphs of situations. A proportional relationship may initially be expressed using only words, a table of values, an equation, or a graph. For example, given only the information that "*q* varies directly with *p*," students will write an equation, complete a table of values, determine the constant of proportionality, construct a graph from the table of values, and create a scenario to fit the graph.	• The graph of two variables that are proportional, or that vary directly, is a line that passes through the origin, (0, 0). • When analyzing the table of two variables that vary directly, the ratios of the *y*-value to the *x*-value for any pair are equivalent. • The equation used to represent a proportional relationship between two values is $y = kx$, where *x* varies directly with *y*, and *k* is the constant of proportionality. • A table of equivalent ratios, a graph of a straight line through the origin, and an equation of the form $y = kx$ can be created to represent a scenario describing quantities in a proportional relationship.	**7.4A** 7.4C	**2**
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					4

2 Applying Proportionality

Module Pacing: 24 Days

Topic 1: Proportional Relationships

ELPS: 1.A, 1.C, 1.D, 1.E, 2.C, 2.D, 2.G, 2.H, 3.A, 3.B, 3.C, 3.D, 3.F, 4.A, 4.B, 4.C, 4.K, 5.E

Topic Pacing: 17 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Markups and Markdowns** Introducing Proportions to Solve Percent Problems	Students review using models to solve percent problems. They analyze strategies for calculating the unknown value in a percent problem. Students then set up $\frac{\text{part of a quantity}}{\text{whole of a quantity}} = \frac{\text{percent part}}{\text{percent whole}}$ proportions to solve markdown and markup percent problems. They analyze strategies that require one or more steps to answer the question in a problem. Students solve percent problems that result from a direct variation relationship between the two quantities. They identify the constant of proportionality, write an equation to represent the situation, and solve for unknown quantities.	• Strip diagrams are used to solve percent problems. • Proportions are used to solve percent problems. • Part-to-whole ratios are used to solve percent problems. • Proportions can be used to solve markdown and markup problems. • Multiple strategies can be used to solve percent problems with proportions. • Percent problems are related to direct variation within the context of real-world situations. • Proportional relationships can be represented by an equation of the form $y = kx$.	**7.4D** 7.13F	2
2	**Perks of Work** Calculating Tips, Commission, and Simple Interest	Students solve proportions and percent equations. Tipping and commission are used as the contexts throughout the activities. Examples of using a proportion and using a percent equation to determine amounts of tips are given. Students explain how the variable was isolated in each solution process. They are given percents and solve for unknown tip amounts using both a proportion and a percent equation. Students are given examples using proportions and percent equations to determine unknown tip percents and explain how the variable was isolated in these solutions. They then solve for an unknown total bill when they know the tip percent and the desired tip amount. Students connect percents in the context of commissions to direct variation and proportionality. A 10% commission rate is shown in a partially complete table of values. Students complete the table, graph the relationship between the quantities, write an equation to represent the situation, and solve for unknown quantities. Students compute commissions, commission rates, and total sales.	• Proportions are used to solve percent problems. • A proportion used to solve a percent problem is often written in the form, percent $= \frac{\text{part}}{\text{whole}}$. • *Percent equations* are used to solve percent problems. • A percent equation can be written in the form, percent $\cdot$ whole = part. • Percent problems are related to direct proportionality within the context of real-world situations. • Proportional relationships can be represented by an equation, a table, or a graph.	**7.4D** 7.13E	3

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**No Taxation Without Calculation** Sales Tax, Income Tax, and Fees	This lesson focuses on sales tax and income tax. Students use their knowledge and skills using percents to make sense of these financial concepts. Students are introduced to sales tax. They analyze three representations (table, graph, and equation) that model sales tax charges for three states. Students then solve problems related to income tax. In the final activity, students identify the percent relationship between two amounts as a proportional relationship, with a unit rate and constant of proportionality.	• Proportional relationships are the basis for solving percent problems in a real-world context. • *Sales tax* is a percent of the selling prices of many goods or services that is added to the price of an item. The percent of sales tax varies by state, but it is generally between 4% and 7%. • *Income tax* is a percent of a person's or company's earnings that is collected by the state and national government.	**7.4D** 7.13A	2
Mid-Topic Assessment					1
4	**More Ups and Downs** Percent Increase and Percent Decrease	Definitions are given for *percent increase* and *percent decrease*. Students compute percent increase and percent decrease in several situations. In the last activity, students apply percent increase and decrease to solving problems involving geometric measurement.	• *Percent increase* occurs when the new amount is greater than the original amount. To compute the percent increase, divide the amount of increase by the original amount. • *Percent decrease* occurs when the new amount is less than the original amount. To compute the percent decrease, divide the amount of decrease by the original amount.	**7.4D**	**1**
5	**Pound for Pound, Inch for Inch** Scale and Scale Drawings	Students use scale models to calculate measurements and enlarge and reduce the size of models. They encounter real-world situations involving maps and blueprints. In each of these situations, they will enlarge or reduce the size of objects and calculate relevant measurements. Students explore scale drawings. The scale of a drawing is drawing length : actual length, and the scale of a map is map distance : actual distance. Students describe the meaning of several different scales. They analyze a map of the United States and approximate distances between cities. Students then determine which scale will produce the largest and smallest drawing of an object when different units of measure are given.	• *Scale drawings* are representations of real objects or places that are in proportion to the real objects or places they represent. The scale is given as a ratio. • The scale of a drawing is the ratio drawing length : actual length. • The scale of a map is the ratio map distance : actual distance. • When calculating the area of a scaled figure, the scale must be applied to all dimensions of the figure.	7.5A **7.5C**	**2**
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					5

Topic 2: Financial Literacy: Interest and Budgets

ELPS: 1.A, 1.C, 1.D, 1.E, 2.C, 2.D, 2.G, 2.H, 3.A, 3.B, 3.C, 3.D, 3.E, 3.F, 4.A, 4.B, 4.C, 4.F, 4.K, 5.E, 5.F

Topic Pacing: 7 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Student Interest** Simple and Compound Interest	This lesson focuses on comparing and contrasting simple interest and compound interest. Students are introduced to the mathematical terms *principal, simple interest,* and *compound interest*. They analyze a table comparing an investment using both simple and compound interest over 30 years. They learn that simple interest calculations produce a constant rate of change and a linear graph, while compound interest calculations produce an increasing rate of change and a graph that curves upward. Students are presented with the simple interest formula, $I = Prt$, where I represents the interest, P represents the principal, r represents the interest rate, and t represents the time in years. They use the formula primarily to calculate the amount of interest earned. In one case, students calculate the rate of interest. Students calculate compound interest using two different methods. They complete some table entries using the simple interest formula on the growing principal. Next, students use the compound interest formula, $B = P_0 (1 + r)^t$, where B represents the final balance, P_0 represents the original principal amount invested, r represents the annual rate, and t represents the time in years. Students use the formula primarily to calculate the new balance including interest. In one case, they calculate the amount of time it will take to double the principal. Throughout the lesson, students are asked to explain the differences between simple interest and compound interest.	• *Simple interest* is a percentage of the *principal* that is added to the investment over time. • The simple interest formula is $I = Prt$, where I represents the interest, P represents the principal, r represents the interest rate, and t represents the time in years. • Simple interest calculations produce a constant rate of change and a linear graph. • *Compound interest* is a percentage of the principal and the interest that is already added to the investment over time. • The compound interest formula is $B = P_0 (1 + r)^t$, where B represents the final balance, P_0 represents the original principal amount invested, r represents the annual rate, and t represents the time in years. • Compound interest calculations produce an increasing rate of change and a graph that curves upward. • An investment/loan with compound interest increases much more quickly than the same investment/loan with simple interest.	7.13E	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
2	**Aren't Peace, Love, and Understanding Worth Anything?** Net Worth Statements	Students are introduced to the financial terms *net worth, assets,* and *liabilities*. They categorize a list of items as being assets or liabilities and discuss ambiguous cases. Students are introduced to another asset, the retirement investment account. Common examples of retirement accounts, a *401(k) plan* and a *403(b) plan*, are explained. Students then organize a more complex list of assets and liabilities with dollar amounts to complete a net worth statement.	• *Net worth* is a calculation of the value of everything that a person owns minus the amount of money the person owes. • *Assets* include the value of all accounts, investments, and things that a person owns. Assets are positive and add to a person's worth. • *Liabilities* are financial obligations, or debts, that a person must repay. Liabilities are negative and take away from a person's worth. • A net worth statement includes a list of a person's assets and liabilities as well as the calculation for the person's net worth. • A *401(k) plan* is a retirement investment account set up by employers. A portion of the employee's pay is invested into the account, with the employer matching a certain amount of it. • A *403(b) plan* is a retirement investment account similar to a 401(k) plan, but it is generally used for public school employees or other tax-exempt groups.	7.13C	1

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**Living Within Your Means** Personal Budgets	Students are introduced to the concept of a personal budget. They are provided a budget for a family represented as a circle graph along with the family's income. They calculate the amount of money spent for each category after estimating the percents from the circle graph. Next, students are provided with the dollar values for a family's expenses, and they must determine the percents and create a circle graph for the family budget. A circle template is provided with sectors representing 5% to aid in making an accurate circle graph rather than have students use a protractor. Throughout the lesson, students are asked to determine the gross income needed to maintain the family budget represented by the circle graph. To further bring the concept of budget to reality, students use the Family Budget Estimator (available at www.familybudgets.org), an online tool created by the Center for Public Policy Priorities in Texas. They determine the minimum household budget needed for a family of four to meet its basic needs in their region of the state. They are then asked to figure out the hourly wage necessary to provide for the family based upon the minimum budget determined by the website.	• A *personal budget* is an estimate of the costs that a person or family will need for specific financial items. It generally includes current expenses as well as savings for anticipated future expenses. • Some typical categories in a household budget include: home, food, utilities, transportation, entertainment, and savings. • A circle graph is a common representation for a family budget because it allows for easy comparison of expense categories. • When given the percents for the budget categories on a circle graph and the total income, the amounts for each category can be determined. • When given the amounts for each category of a budget, the percents can be determined and a circle graph can be made to represent the budget. • The *Family Budget Estimator* is an online tool created by the Center for Public Policy Priorities in Texas. It allows residents to determine the cost of raising a family in each of Texas' major metropolitan areas. • When budgeting for expenses, taxes must be considered so that a gross income can be determined that can support a family's budget.	**7.4D** 7.13B 7.13D	**1**
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					2

3 Reasoning Algebraically

Module Pacing: 37 Days

Topic 1: Operating with Rational Numbers

ELPS: 1.A, 1.D, 1.F, 2.C, 2.D, 2.G, 2.H, 3.A, 3.B, 3.C, 3.D, 3.G, 4.A, 4.B, 4.C, 4.K, 5.E

Topic Pacing: 8 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**All Mixed Up** Adding and Subtracting Rational Numbers	Students apply their knowledge of adding and subtracting positive and negative integers to the set of rational numbers.	• Estimation can be used to approximate the sum or difference of two integers and the sum or difference of other rational numbers. • The meaning of the number 0 can change depending on the context. • Addition and subtraction of positive and negative rational numbers can be used to solve real-world problems. • The rules for operating on integers also apply to operating on rational numbers.	7.2A 7.3A **7.3B**	**1**
2	**Be Rational!** Quotients of Integers	Students write the quotients of integers as fractions and decimals. They use long division to convert fractions into decimals. The terms *terminating decimal, non-terminating decimal, repeating decimal, non-repeating decimal,* and *bar notation* are introduced. Students classify decimals and write repeating decimals using bar notation. They conjecture that the quotient of any two integers, with a non-zero divisor, is a rational number and its decimal representation terminates or repeats. Students sort representations of negative rational numbers and notice that the negative sign in a negative rational number can be placed in front of the fraction (quotient of two integers), in the numerator (dividend), or in the denominator (divisor).	• Decimals are classified as terminating and non-terminating. *Non-terminating decimals* are classified as repeating or non-repeating. • *Bar notation* is used when writing *repeating decimals*. • The quotient of two integers, when the divisor is not zero, is a rational number. • The sign of a negative rational number in fractional form can be placed in front of the fraction, in the numerator of the fraction, or in the denominator of the fraction.	7.3A **7.3B**	1
3	**Building a Wright Brothers' Flyer** Simplifying Expressions to Solve Problems	Students solve real-world problems involving simplifying numeric expressions using the four operations and signed rational numbers. Students will also evaluate expressions with signed rational numbers for the variable and use the Order of Operations to simplify.	• Expressions and equations composed of rational numbers can be used to solve real-world problems. • *Percent error* is a ratio comparing the difference of the actual value and the estimated value to the actual value. • Percent error can be used as a measure of the accuracy of an estimated value. • Percent error can be a positive or negative value.	7.3A **7.3B**	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
4	**Properties Schmoperties** Using Number Properties to Interpret Expressions with Signed Numbers	Students solve mathematical problems involving simplifying numeric expressions using number properties and signed rational numbers. Students will also use what they know about the opposites of numbers to derive a method for distributing and factoring with -1 and to convert subtraction to the addition of the opposite of a number.	• Number properties can be used to solve mathematical problems. • The opposite of an expression can be modeled as a reflection across 0 on the number line. • The opposite of an expression is the same as the expression with -1 factored out. • Number properties can be used to operate with rational numbers in order to make the computations more efficient. • Subtraction of an integer can be written as the addition of the opposite of that integer.	7.3A **7.3B**	1
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					2

Topic 2: Algebraic Expressions

ELPS: 1.A, 1.D, 1.E, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 4.A, 4.B, 4.C, 4.K, 5.E

Topic Pacing: 8 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**No Substitute for Hard Work** Evaluating Algebraic Expressions	Students review variables, algebraic expressions, and how to evaluate algebraic expressions. They plot a variety of variable expressions with x on a number line, first under the condition that $x > 0$ and then under the condition that $x < 0$, focusing on the distance of x from 0 to determine the placement of the expressions. Students substitute values for the variable to validate the correct placement of the expressions on the number lines. They then substitute values for unknowns in two related contexts. Finally, students formally review evaluating an algebraic expression and practice this skill, with and without tables.	• A *variable* is a letter or symbol that is used to represent an unknown quantity. • An *algebraic expression* is a mathematical phrase involving at least one variable, and it may contain numbers and operational symbols. • A *linear expression*, with respect to the variable x, is a sum of terms which are rational numbers or rational numbers times x. • To *evaluate an expression*, replace each variable in the expression with numbers and then perform all possible mathematical operations.	7.3A 7.10A	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
2	**Mathematics Gymnastics** Rewriting Expressions Using the Distributive Property	Students rewrite linear expressions using the Distributive Property. First, they plot related algebraic expressions on a number line by reasoning about magnitude. Students realize that rewriting the expressions reveals structural similarities in the expressions, which allows them to more accurately plot the expressions. They then review the Distributive Property. Students expand algebraic expressions using both the area model and symbolic representations, focusing on the symbolic. They then reverse the process to factor linear expressions. Students factor expressions by factoring out the greatest common factor and by factoring out the coefficient of the linear variable. Finally, students rewrite expressions in multiple ways by factoring the same value from each term of the expression.	• The Distributive Property provides ways to write numerical and algebraic expressions in equivalent forms. • The Distributive Property states that if a, b, and c are any real numbers, then $a(b + c) = ab + ac$. • The Distributive Property is used to expand expressions. • The Distributive Property is used to factor expressions. • To *factor* an expression means to rewrite the expression as a product of factors. • A *coefficient* is the number that is multiplied by a variable in an algebraic expression. • A *common factor* is a number or an algebraic expression that is a factor of two or more numbers or algebraic expressions. • The *greatest common factor* is the largest factor that two or more numbers or terms have in common. An expression can be factored in an infinite number of ways.	6.7D 7.3A 7.10A **7.11A**	**1**
3	**All My Xs** Combining Like Terms	Expressions are simplified by combining like terms with integer, fraction, and decimal coefficients. Students write expressions to represent situations and use properties to simplify the expressions. They then add and subtract algebraic expressions, using addition of the opposite to subtract.	• A *coefficient* is the number that is multiplied by a variable in an algebraic expression. • Terms are considered like terms if their variable portions are the same. *Like terms* can be combined.	6.7D 7.10A	**1**
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					3

Topic 3: Two-Step Equations and Inequalities

ELPS: 1.A, 1.C, 1.D, 1.E, 1.F, 1.G, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.E, 3.F, 4.A, 4.B, 4.C, 4.D, 4.G, 4.K, 5.E

Topic Pacing: 11 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Picture Algebra** Modeling Equations as Equal Expressions	This lesson models real-world situations using picture algebra, and defines *equations* as representing equal expressions. Questions ask students to use models to solve for unknown quantities, and write expressions and equations. Students model contextual situations using bar models. The models serve two purposes: they assist students in solving the problem and they provide scaffolding for writing expressions and equations in the remaining questions.	• An *equation* is a statement created by placing an equals sign between two expressions. • Algebraic expressions and equations represent relationships between values. • Equations can be modeled using bar models. • To solve an equation with a variable is to determine a value for the variable that makes the statement true.	**7.11A**	2
2	**Expressions That Play Together . . .** Solving Equations on a Double Number Line	In this lesson, students model contextual and mathematical situations using double number lines. The models serve two purposes: they assist students in solving the problem, and they provide scaffolding for writing expressions and equations in the remaining questions.	• An equation is a statement created by placing an equals sign between two expressions. • Algebraic expressions and equations represent relationships between values. • Equations can be modeled using double number lines. • To solve an equation with a variable is to determine a value for the variable that makes the statement true.	7.10B **7.11A**	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**A Formal Affair** Using Inverse Operations to Solve Equations and Inequalities	Students learn the formal strategies for solving two-step equations and formalize the language of solving equations. They review the Properties of Equality and use the properties to justify applying inverse operations to solve equations. Because of the Properties of Equality, if an operation is applied to both sides of an equation, the transformed equation has the same solution as the original equation. Students then use inverse operations to solve equations. Students learn strategies for developing efficiency in solving two-step equations. They learn that, because of the Properties of Equality, they can multiply or divide all terms of an equation by the same rational number to ease computations. They apply the strategies learned throughout the lesson to solve two-step linear equations, including number riddles. As they solve equations, they also check their solutions. Finally, students summarize solving two-step equations and write real-world scenarios that model situations involving equations.	• A solution to an equation is any variable value that makes that equation true. • The Properties of Equality state that if an operation is performed on both sides of the equation, to all terms of the equation, the equation maintains its equality. • When the Properties of Equality are applied to an equation, the transformed equation will have the same solution as the original equation. • Strategies to improve equation-solving efficiency include multiplying terms of an equation with fractions by the least common denominator, multiplying the terms of an equation with decimals by the appropriate multiple of 10, or dividing out a common factor of the terms of an equation. • To determine if a solution to an equation is correct, substitute the value of the variable back into the original equation and if the equation remains equivalent, the solution is correct. • An inequality is any mathematical sentence that has an inequality symbol such as $<$, $>$, $\geq$, or $\leq$. • The graph of an inequality in one variable is the set of all points on a number line that makes the inequality true. • The solution set of an inequality is the set of all points that makes the inequality true. • The inequality symbol remains the same when adding, subtracting, and multiplying or dividing an inequality by a positive number. • The inequality symbol reverses when multiplying or dividing an inequality by a negative number.	7.10A 7.10B 7.10C **7.11A** 7.11B	3
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					3

Topic 4: Multiple Representations of Equations

ELPS: 1.A, 1.D, 1.E, 1.G, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.F, 4.A, 4.B, 4.C, 4.G, 4.K, 5.E

Topic Pacing: 10 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Put It on the Plane** Representing Equations with Tables and Graphs	Students analyze linear equations using tables and graphs. Given situations written as sentences, students identify the quantities that change, the quantities that remain constant, and the quantity that depends on the other. They write and solve equations. Students then create a table of values related to the situation. Using the table of values, they define the upper bounds, lower bounds, and intervals of the graph and create a graph of the situation. Students then answer questions related to possible ordered pairs and use the equation and the graph to justify their reasoning. In one situation, students answer questions regarding events that occurred before a specified time, and the timing of those events are represented using negative numbers. Throughout the lesson, students explain if the linear situations represent proportional relationships using the tables, equations, and graphs.	• A real-world linear problem situation can be expressed using multiple representations. • A real-world linear problem situation can be represented as a sentence, as a table, as a graph, and as an equation. • An equation provides information about the graph of the problem situation. • Negative numbers are used to represent time that has already elapsed, or the past tense.	**7.7A** 7.10A **7.11A**	2
2	**Deep Flight I** Building Inequalities and Equations to Solve Problems	Students work with a negative rate of change. They use negative values to create a table and graph a problem situation. Students write an equation that represents the situation with a negative value for the unit rate of change, answer several questions, and enter the results in a table which is used to graph the situation. Students analyze the graph to write inequalities based on constraints provided in the scenario. Students write and solve inequalities to answer questions about the scenario.	• The *unit rate of change* is the amount that the dependent value changes for every one unit that the independent value changes. • Multiple representations such as a table, an equation, and a graph are used to represent a problem situation.	**7.4A** **7.7A** 7.10A **7.11A**	2
3	**Texas Tea and Temperature** Using Multiple Representations to Solve Problems	Students put together all that they have learned about the different representations of a linear relationship. Throughout these activities, students are given one of the representations—a verbal description, an equation, a table, or a graph—and they have to use what they know from that representation to create the other representations. They connect these different representations to model each situation.	• Multiple representations such as a table, an equation, and a graph are used to represent a problem situation. • A table of values is used to determine an equation and a graph. • A graph is used to determine a table of values and an equation.	**7.4A** **7.7A** 7.10C	2
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					3

4 Analyzing Populations and Probabilities

Module Pacing: 39 Days

Topic 1: Introduction to Probability

ELPS: 1.A, 1.D, 1.E, 1.G, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.F, 4.A, 4.B, 4.C, 4.G, 4.K, 5.E

Topic Pacing: 12 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Rolling, Rolling, Rolling ...** Defining and Representing Probability	Students conduct an experiment that involves rolling one six-sided number cube. The terms *outcome, experiment, sample space, event, simple event, probability, complementary events,* and *equally likely* are defined. Students calculate probabilities rolling number cubes, using spinners, and drawing marbles from a bag.	• An *experiment* is a situation involving chance that leads to results or outcomes. • An *outcome* is the result of a single trial of an experiment. • A *sample space* is the list of all possible outcomes of an experiment. • An *event* is one or a group of possible outcomes for a given situation. • A *simple event* is an event consisting of one outcome. • *Probability* is a measure of the likelihood that an event will occur. • The probability of an event can be determined by using the formula: Probability $= \frac{\text{number of times an event can occur}}{\text{number of possible outcomes}}$. • When the probability of an event is equal to 0 there is no chance that the event will occur. • When the probability of an event is equal to 1 there is certainty that the event will occur. • *Complementary events* are events that consist of the desired outcomes and the remaining events that consist of all the undesired outcomes. • The sum of the probabilities of any two complementary events is 1.	7.6E	**2**
2	**Give the Models a Chance** Probability Models	The terms *probability model, uniform probability model*, and *non-uniform probability model* are defined in this lesson. Students will develop a probability model for an experiment and use it to determine probabilities of events. They will construct and interpret uniform and non-uniform probability models.	• A *probability model* is a list of each possible outcome along with its probability. The sum of all the probabilities for the outcomes will always be 1. • A *uniform probability model* is a model in which all of the probabilities are equally likely to occur. • A *non-uniform probability model* is a model in which all of the probabilities are not equally likely to occur.	**7.6I**	1
		Mid-Topic Assessment			**0**

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**Toss the Cup** Determining Experimental Probability of Simple Events	Students flip a coin multiple times to determine the probabilities of heads and tails based on the results of the experiment. The terms *theoretical probability* and *experimental probability* are defined in this lesson. Students conduct trials of a Toss the Cup experiment to estimate probabilities of the three outcomes. They also conduct trials of a spinner game in order to calculate experimental probabilities using data. Students use those experimental probabilities to predict the number of outcomes for a given number of trials. They then compare the experimental probabilities to the theoretical probabilities using *percent error*.	• *Experimental probability* is the ratio of the number of times an event occurs to the total number of trials performed. • *Theoretical probability* is the ratio of the number of desired outcomes to the total possible outcomes. • *Percent error* is one way to measure the difference between experimental and theoretical probabilities.	7.6C 7.6D **7.6H**	2
4	**A Simulating Conversation** Simulating Simple Experiments	The term *simulation* is defined in this lesson. A coin toss serves as a simulation to determine the experimental probability of the percent of female babies born at a hospital. Students note that as the number of trials increases, the experimental probability approaches the theoretical probability. Other situations used in this lesson are a five-question multiple-choice test, a ten-question true-or-false test, a number cube game, and a card game. Students describe simulation models that fit each situation.	• A *simulation* is an experiment that models a real-life situation. When conducting a simulation, you must choose a model that has the same probability as the event. • A trial is a repetition of an experiment. Each time the experiment is repeated, it is called a trial. • The experimental probability of an event approaches the theoretical probability as the number of trials increases, which occurs with a large number of trials.	7.6B 7.6C 7.6D	2
		End of Topic Assessment			1
		Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*			4

Topic 2: Compound Probability

ELPS: 1.A, 1.C, 1.D, 1.E, 1.G, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.F, 4.A, 4.B, 4.C, 4.D, 4.G, 4.K, 5.E

Topic Pacing: 12 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Evens or Odds?** Using Arrays to Organize Outcomes	This lesson provides the foundation for probability of compound events. Students use arrays and lists to determine sample spaces and calculate probabilities. First, they conduct an experiment tossing two coins and predict the theoretical probability of each outcome based on their experiment. Next, students conduct trials using a six-sided number cube, record the data in a table, and determine the experimental probabilities of each possible sum of the numbers on the cubes. They use an array to organize the outcomes, determine the sample space, and then determine the theoretical probabilities. These probabilities are used to calculate probabilities of compound events (but not stated as such) and make predictions using proportional reasoning. Finally, students practice these skills with a 4-section spinner and the Getting Started activity.	• Experimental probability is the ratio of the number of times an event occurs to the total number of trials performed. • Theoretical probability is the mathematical calculation that an event will occur in theory (long-run relative frequency). • Experimental probability can be used to predict theoretical probability. • Arrays and lists are useful for organizing outcomes and determining the sample space of an experiment. • Proportional reasoning is used to make predictions about the expected number of times an outcome will occur based on the probability of the outcome.	7.6A 7.6C 7.6D **7.6I**	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
2	**Who Doesn't Love Puppies?!** Using Tree Diagrams	Students use experimental data to create a probability model and then construct a second probability model using theoretical probabilities for comparison purposes. Tree diagrams are introduced as another method to illustrate all the possible outcomes in a sample space. Students then analyze a given tree diagram modeling the same situation and create a third probability model. In the second activity, a five-sided spinner and a tree diagram are used to generate all possible outcomes to create a probability model and answer related questions. To demonstrate their understanding, students create a tree diagram for all possible outcomes of correctly guessing the answers to a three-question true-or-false test. They then use the tree diagram to create a probability model and use the model to determine specified probabilities.	• Another method to determine the theoretical probability of an event is to construct a tree diagram. • A *tree diagram* is a tree-shaped diagram that illustrates the possible outcomes of a given situation. • A tree diagram shows how each possible outcome of an event affects the probabilities of the other events.	7.6A 7.6C 7.6D	**1**
3	**Pet Shop Probability** Determining Compound Probability	The term *compound event* is defined in this lesson. Within the context of the first situation, students determine the probability for three events by calculating the sum of the probabilities of each event. In the second situation, students calculate and compare the probability of a compound event with the word "and" to the probability of a compound event with the word "or." They distinguish between the two compound events; they state that the compound event associated with the word "and" means the simple events both (or all) occur, while the compound event associated with the word "or" means any combination of one or more simple events occurring. When calculating the probability of a compound event, students learn not to count repeated outcomes if the same outcome appears in more than one simple event.	• A *compound event* combines two or more events, using the word “and” or the word “or.” • The probability of a compound event with the word “and” is the probability of two or more events occurring at the same time. • The probability of a compound event with the word “or” is the probability of one or more of the named simple events occurring.	7.6A 7.6D	2
4	**On a Hot Streak** Simulating Probability of Compound Events	Students design and conduct simulations that model three situations. They use the tool of their choice to simulate the free throws made by a basketball player. Students then use a random number table to model a problem situation involving various blood groups that a person might have and donate. Finally, students use the tool of their choice to simulate the kicks by a football kicker. During these problems, students have the opportunity to reinforce their new knowledge of compound probabilities. Students use the simulations to determine the number out of the next set of numbers that meet the criterion, as well as how many people, free throws, or kicks until the first success.	• Simulations are used to estimate compound probabilities. • A greater number of trials of a simulation should show that the experimental probability of an event approaches the same value as the theoretical probability of that event. • Depending on the question posed, one trial of a simulation may consist of a fixed or variable number of observations.	7.6B 7.6C 7.6D	2
	End of Topic Assessment				1
	Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*				4

Topic 3: Drawing Inferences

ELPS: 1.A, 1.D, 1.E, 1.G, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.F, 4.A, 4.B, 4.C, 4.G, 4.K, 5.E

Topic Pacing: 15 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**We Want to Hear From You!** Collecting Random Samples	Students review the statistical process and deepen their understanding of the second component of the process: data collection. They are introduced to new terms related to data collection. Students then read various problem situations and differentiate between *census* and *sample* and *parameter* and *statistic*. Students learn that a sample is smaller than the population, and that it represents characteristics of the population. They encounter methods for selecting samples from a population and determine if methods inadvertently misrepresent the population. Students use two tools to generate random numbers: randomly selecting numbers from a bag, and using provided random number tables.	• A *survey* is a method of collecting information from a population or sample of a population. • A *population* is the entire set of items from which data can be selected. • A *census* is the collection of data from every member of a population. • The characteristic used to describe the population is called a *parameter*. • A *statistic* describes the sample from a population and can be used to make a prediction about a parameter. • A *random sample* is a sample that is selected from the population in such a way that every member of the population has the same chance of being selected. • A sample generated randomly is more likely to be representative of the population than one that is not generated randomly. • Random number tables are used to generate random numbers when the population size is large.	7.6F 7.12B	2
2	**Tiles, Gumballs, and Pumpkins** Using Random Samples to Draw Inferences	Students use statistical information gathered from a sample to determine a parameter for a population. They complete this process two times with one scenario. The first time students may select the sample using various methods; however, the second time they follow a specific strategy to select a random sample. In each case, students use proportional reasoning to estimate the parameter. They compute percent error and conclude that statistics obtained from samples are more likely to represent the parameter of the population if the sample is randomly chosen. They then analyze data from 100 samples and predict the parameter from the data. Finally, students are provided with a scenario and must design and carry out a sampling plan to estimate the parameter.	• Statistics obtained from samples are more likely to represent the parameter of the population if the sample is randomly chosen. • Statistics are used to estimate parameters. • Proportional reasoning can be used with statistics to estimate parameters. • Percent error can be used as a measure of the variation between a statistic and a parameter.	7.6B 7.6F 7.12B	2

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**Raising the Bar** Bar Graphs	In this lesson, students analyze categorical data presented in bar graphs. Students analyze three types of bar graphs—single bar graphs (with horizontal or vertical bars), double bar graphs, and stacked bar graphs. Students then answer questions about data provided and create their own graphs from data sets.	• Bar graphs display data using vertical or horizontal bars. The height or length of each bar indicates its value. A scale must be provided to read bar graphs. • Double bar graphs and stacked bar graphs may be used when each category contains two different groups of data. A key must be provided to tell the two different groups apart, and a scale must be provided to read the values of the data. • The side-by-side bars in a double bar graph make it easy to compare how much larger, or how many times bigger, one value is than the other. • Stacked bars in a stacked bar graph make it easy to compare parts to the whole within a category. • Circle graphs can also be used to compare parts to the whole.	**7.6G** 7.12C	2
4	**Dark or Spicy?** Comparing Two Populations	Within the context of a situation, students calculate the measures of center and measures of variability for two different populations. They compare the difference of the measures of center for the two populations to their measures of variation. Students construct line plots and determine a five-number summary for a data set for comparison purposes. A stem-and-leaf plot is used to display data in one situation.	• Measures of center, including the mean and median, can be used to compare data sets for two populations. • Measure of variation, including the spread, distribution, interquartile range (IQR), and five-number summary, can be used to compare data sets for two populations. • A dot plot or a stem-and-leaf plot can be used to display two sets of data in order to compare measures of center and variation.	**7.6G** **7.12A**	**1**
5	**That's So Random** Using Random Samples from Two Populations to Draw Conclusions	Students use random samples to draw conclusions about two populations. The characteristics of the two populations are analyzed using graphical displays in the form of stem-and-leaf plots and box plots. In the first situation, students are given a table of values containing data for two populations. In the second situation, students are given two histograms containing data for two distinct populations. Students create graphical displays to answer questions related to each problem situation. Questions focus on means, medians, ranges, mean absolute deviation, and interquartile ranges.	• Measures of center for samples from two populations are compared. • Graphical displays such as stem-and-leaf plots and box plots are used to determine the characteristics of two populations.	7.6F **7.12A** 7.12C	2
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					5

TEXAS MATH SOLUTION

5 Constructing and Measuring

Module Pacing: 19 Days

Topic 1: Area and Surface Area

ELPS: 1.A, 1.B, 1.C, 1.D, 1.E, 1.F, 1.G, 2.A, 2.B, 2.C, 2.D, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.D, 3.F, 3.H, 3.I, 3.J, 4.A, 4.B, 4.C, 4.D, 4.E, 4.G, 4.I, 4.J, 4.K, 5.A, 5.B, 5.C, 5.E

Topic Pacing: 11 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Slicing and Dicing** Composite Figures	In this lesson, students calculate the area of complex figures. They compare two methods: decomposing a figure into familiar shapes and composing a figure into a rectangle. Students then solve problems in context, including the area of countries, using map scales to approximate areas. They use given dimensions and problem solving to calculate the area of a triangle embedded in a square.	• The area of a *composite figure* can be determined by decomposing the figure into rectangles, parallelograms, or triangles and then adding the areas of those figures. • The area of a composite figure can be determined by composing the figure into a rectangle and then subtracting the area of the shape that is not part of the composite figure. • When calculating the area of composite figures, additional steps, such as determining dimensions and using a scale, may be necessary.	**7.9C**	**1**
2	**Breaking the Fourth Wall** Surface Area of Rectangular Prisms and Pyramids	Students apply mathematical and spatial reasoning to determine the surface areas of prisms and pyramids using nets, drawings, and measurements. Students solve a variety of surface area problems and distinguish between volume and surface area measurements.	• A *net* is a two-dimensional representation of a three-dimensional geometric figure. • The *surface area* of a three-dimensional figure can be calculated by determining the areas of each face of the figure.	7.9D	3

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**Seeing it From a Different Angle** Special Angle Relationships	Students explore the types of angles formed when two lines intersect. They learn the definitions of *complementary angles, supplementary angles, perpendicular lines, adjacent angles, linear pairs of angles,* and *vertical angles*. Throughout the lesson, students use patty paper to illustrate the special angle pairs and any special relationships between the measures of angle pairs. Students write and solve equations involving the sum of angles in a triangle and special angle relationships.	• Two angles are *supplementary* if the sum of their angle measures is equal to 180°. • Two angles are *complementary* if the sum of their angle measures is equal to 90°. • Two lines, line segments, or rays are *perpendicular* if they intersect to form 90° angles. • Patty paper and protractors are tools used to explore line and angle relationships. • *Adjacent angles* are two angles that share a common vertex and a common side. • A *linear pair* of angles is two adjacent angles with non-common sides that form a line. • The angles in a linear pair are supplementary. • *Vertical angles* are two non-adjacent angles that are formed by two intersecting lines. • Vertical angles have the same measure, or are congruent. • The Triangle Sum Theorem can be applied to solve for unknown values or angle measures in a triangle.	7.11C	3
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					3

Topic 2: Three-Dimensional Figures

ELPS: 1.A, 1.B, 1.D, 1.E, 1.G, 1.H, 2.C, 2.D, 2.E, 2.F, 2.G, 2.H, 2.I, 3.A, 3.B, 3.C, 3.F, 4.A, 4.B, 4.C, 4.E, 4.F, 4.G, 4.H, 4.K, 5.D, 5.E, 5.G

Topic Pacing: 8 Days

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
1	**Hey, Mister, Got Some Bird Seed?** Volume of Pyramids	Students cut out given nets and assemble an open rectangular prism and an open rectangular pyramid. They compare the models and determine that the heights and bases are congruent. Students fill the models with birdseed to discover that the volume of the pyramid is one-third the volume of the prism and then write the formula for the volume of each. Students repeat the activity for a triangular prism and a triangular pyramid with congruent heights and bases. They then use the volume formulas to solve problems involving rectangular and triangular prisms and pyramids. Finally, students investigate the effect of doubling and tripling dimensions of prisms and pyramids on the volume.	• A pyramid is a polyhedron with one base and the same number of triangular faces as there are sides of the base. The triangular faces are called lateral faces. • A rectangular pyramid is a pyramid that has a rectangle as its base. • A triangular pyramid is a pyramid that has a triangle as its base.	7.8A 7.8B **7.9A**	3
2	**Sounds Like Surface Area** Surface Area of Pyramids	Students compare two different pieces of acoustical foam: one that is made up of square pyramids and one that is made up of triangular prisms. Students are introduced to the term *lateral surface area*, and they compare the total and lateral surface areas of the foam pieces. They then determine the total amount of foam that covers the top surface of the two foam boards. Finally, students use the formulas for the volume, total surface area, and lateral surface area of rectangular and triangular prisms and pyramids to solve real-world problems.	• A prism is a polyhedron with two parallel and congruent faces called bases. All other faces are parallelograms and are called lateral faces. • A rectangular prism is a prism that has rectangles as its bases. • A triangular prism is a prism that has triangles as its bases. • A pyramid is a polyhedron with one base and the same number of triangular faces as there are sides of the base. The triangular faces are called lateral faces. • A rectangular pyramid is a pyramid that has a rectangle as its base. • A triangular pyramid is a pyramid that has a triangle as its base.	**7.9A** 7.9D	2

Texas Grade 7: Scope & Sequence

150-Day Pacing

Lesson	Lesson Title	Highlights	Essential Ideas	TEKS*	Pacing**
3	**More Than Four Sides of the Story** Volume and Surface Area of Prisms and Pyramids	Students use the strategies for calculating the volumes and surface areas of right rectangular prisms and pyramids to calculate the volumes and surface areas of prisms and pyramids with non-rectangular bases. They apply the formulas $V = Bh$ and $V = \frac{1}{3}Bh$ to calculate the volume of prisms and pyramids. Students develop a strategy to calculate the areas of regular polygons. They use that strategy to solve problems about regular polygons and to calculate the surface areas and volumes of prisms and pyramids. The final lesson of this topic is optional. The concepts in this lesson build off of the foundation developed in this module, but the lesson is meant to be an extension opportunity, because the content goes beyond the scope of the grade level standards.	• The volume of any prism can be calculated by the formula $V = Bh$, where B is the area of the base, and h is the height of the prism. • The volume of any pyramid can be calculated by the formula $V = \frac{1}{3}Bh$, where B is the area of the base and h is the height of the pyramid. • The *surface area* of any geometric solid is the sum of the areas of the surfaces of the solid. • A *regular polygon* is a polygon with congruent sides and congruent angles. • A regular n-gon can be decomposed into n congruent triangles. • The area of a regular n-gon can be calculated by determining the area of one of the n congruent triangles and multiplying by n. • Polygons and solids can be composed to create additional figures whose areas, surface areas, and volumes can be determined.	**7.9A** **7.9C** 7.9D	**0**
End of Topic Assessment					1
Learning Individually with Skills Practice or MATHia. *Schedule these days strategically throughout the topic to support student learning.*					2

Total Days: 150

Learning Together: 91

Learning Individually: 44

Assessments: 15