TEXAS MATH SOLUTION

1 Composing and Decomposing

Topic 1: Factors and Multiples

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, 5.B, 5.F, 5.G

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Taking Apart Numbers and Shapes** Writing Equivalent Expressions Using the Distributive Property	Students divide area models in different ways to see that the sum of the areas of the smaller regions equals the area of the whole model. They then rewrite the product of two factors as a factor times the sum of two or more terms, leading to the formalization of the Distributive Property.	• The area of a rectangle is the product of its length and width. • An area model of a rectangle with side lengths a and $(b + c)$ can be used to illustrate the Distributive Property. • The Distributive Property states that for any numbers a, b, and c, $a(b + c) = ab + ac$. • Equivalent expressions can be rewritten using properties.	6.7D	1
2	**Searching for Common Ground** Identifying Common Factors and Common Multiples	Students construct rectangles with given areas and relate their dimensions to factors and common factors. They create prime factorizations to determine the greatest common factor (GCF) and least common multiple (LCM) of two numbers. Students examine the rows and columns of an area model to identify multiples and the LCM. They describe the relationship between the product, GCF, and LCM.	• Prime factorization is a method to determine common factors and common multiples of two numbers. • The greatest common factor (GCF) of two numbers is the largest factor shared by the two numbers. • The least common multiple (LCM) of two numbers is the smallest non-zero multiple shared by the two numbers • The Commutative and Distributive Properties are properties used to generate equivalent expressions. • If two numbers a and b are relatively prime, then the GCF $(a, b) = 1$ and the LCM $(a, b) = ab$.	6.7A	2
3	**Composing and Decomposing Numbers** Least Common Multiple and Greatest Common Factor	Students continue to expand their understanding of factors, multiples, common factors, and common multiples as introduced in previous lessons. They use greatest common factor (GCF) and least common multipe (LCM) to solve problems.	• Number relationships are useful in solving problems in context. • Common factors help determine how to divide or share things equally. • Common multiples help determine how things with different cycles can occur at the same time.	6.7A 6.7D	1
End of Topic Assessment					1

Topic 2: Positive Rational Numbers

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Rocket Strips** Dividing a Whole into Fractional Parts	Students create strip diagrams for unit fractions $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{6}, \frac{1}{8}, \frac{1}{12}$, and $\frac{1}{16}$. They identify equivalent fractions by aligning the strip diagrams on the fold lines, and then complete a graphic organizer to represent all the equivalent fractions represented by the strip diagrams. Students conclude that the numerator and denominator of equivalent fractions are multiples of the original unit fractions.	• Strip diagrams are used to compare fractions with different denominators. • A unit fraction is a fraction that has a numerator of 1 and a denominator that is a positive integer. • Equivalent fractions are fractions that represent the same part-to-whole relationship. • Equivalent fractions are fractions generated by multiplying both the numerator and denominator by the same factor.	6.4F 6.5C	1
2	**Getting Closer** Benchmark Fractions	Students translate their understanding of strip diagrams to number lines. They use the benchmark fractions 0, $\frac{1}{2}$, and 1 to estimate the value of fractions, write fractions that are close to these benchmarks, and estimate sums. Students solve a problem which involves comparing fractions that represent shaded parts of figures.	• Benchmark fractions are common fractions used to estimate the value of fractions such as 0, $\frac{1}{2}$, and 1. • A fraction is close to 0 when the numerator is very small compared to the denominator. • A fraction is close to $\frac{1}{2}$, when the numerator is about half the size of the denominator. • A fraction is close to 1 when the numerator is very close in size to the denominator.	6.2D 6.4F	1
3	**Did You Get the Part?** Multiplying Fractions	Students review the area model for multiplication and apply it to multiplying mixed numbers. They analyze two methods for multiplying mixed numbers and then use these methods to answer questions in the context of a real-world scenario.	• Area models can be used to illustrate the multiplication of two fractions, which is essentially the same as taking a part of a part. • An area model representing the multiplication of two mixed numbers can be tiled with fractional unit squares to express the product as an improper fraction. • The product of two fractions represented by an area model is the same as the product of the fractions calculated using the standard algorithm.	6.3B 6.3E	1
4	**Yours IS to Reason Why!** Fraction by Fraction Division	Students connect multiplication to division by writing fraction fact families for area models. They then use strip diagrams and number line models to investigate the division of fractions by fractions. Students use these models to develop an algorithm for rewriting division sentences as multiplication sentences. They apply the procedure to solve problems involving fractions and mixed numbers.	• Area models and fact families can be used to illustrate the quotients of fractions. • The reciprocal or multiplicative inverse of a number $\frac{a}{b}$ is the number $\frac{b}{a}$ where a and b are nonzero numbers. • To calculate the quotient of two fractions, multiply the dividend by the reciprocal of the divisor. • There are other algorithms to divide fractions, such as dividing across in special cases and using complex fractions as a form of 1.	6.2E 6.3A 6.3E	3
		End of Topic Assessment			1

Topic 3: Angles and Shapes

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Consider Every Side** Constructing Triangles Given Sides	Students use patty paper, pasta, and construction tools to explore the information required to create no triangles, unique triangles, or multiple triangles when given two or three possible side lengths. They learn that an infinite number of triangles can be made from only two side lengths. They also learn that unique triangles are formed when provided with three segments that are sufficiently long in relation to each other. Students should note that if all the measures of a triangle are the same as another triangle, even though they are in different orientations, the provided information creates a unique triangle. Students then summarize their knowledge of the conditions that form 0, 1, or multiple triangles.	• Constructing a triangle given the length of two sides does not result in the construction of a unique triangle. • Constructing a triangle given the length of three segments, such that the sum of two segment lengths is greater than the third length, results in the construction of a unique triangle.	6.8A	2
2	**Turning a One-Eighty!** Triangle Sum Theorem	Students explore and justify the relationships between angles and sides in a triangle. They establish the Triangle Sum Theorem and use the theorem as they explore the relationship between interior angle measures and the side lengths of triangles. They then practice applying the theorem.	• The Triangle Sum Theorem states that the sum of the measures of the interior angles of a triangle is 180°. • The longest side of a triangle lies opposite the largest interior angle. • The shortest side of a triangle lies opposite the smallest interior angle.	6.8A	1
3	**All About That Base… and Height** Area of Triangles and Quadrilaterals	Students use previously known area formuals and the principle of area conservation to investigate the areas of parallelograms, triangles, and trapezoids. They use this knowledge to develop formulas for the areas of these shapes, practice calculating areas, and solving area-related problems. Students learn that the choice of base or height does not affect the area of the shape.	• The formula for the area of a rectangle is $A = lw$, where A is the area of the rectangle, l is the length of the rectangle, and w is the width of the rectangle. • The formula for the area of a parallelogram is $A = bh$, where A is the area of the parallelogram, b is the length of the base of the parallelogram, and h is the height of the parallelogram. • The formula for the area of a triangle is $A = \frac{1}{2}bh$, where A is the area of the triangle, b is the length of the base of the triangle, and h is the height of the triangle. • The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area of the trapezoid, h is the height of the trapezoid, and b_1 and b_2 are bases of the trapezoid.	6.8B 6.8C 6.8D	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
4	**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.	6.8D 7.9C	2
End of Topic Assessment					1

Topic 4: Decimals and Volume

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Depth, Width and Length** Deepening Understanding of Volume	In this lesson, students are introduced to geometric solids. Students will investigate various figures and sort them based on the definition of a polygon or a polyhedron. The intent of this lesson is for students to determine the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unti fraction edge lengths. In addition, they will review and practice decimal multiplication by calculating volumes of right rectangular prisms.	• A polygon is a closed figure formed by three or more line segments. • A polyhedron is a three-dimensional figure that has polygons as faces. • A regular polyhedron is a three-dimensional solid that has congruent regular polygons as faces and has congruent angles between all faces. • A cube is a regular polyhedron whose six faces are congruent squares. • A unit cube is a cube that is one unit in length, one unit in width, and one unit in height. • Volume is the amount of space occupied by an object. • The formula for the volume of a cube is $V = lwh$, where l is the length, w is the width and h is the height, or $V = Bh$, where B is the area of the base and h is the height. • When multiplying decimals, the number of decimal places in the product is equal to the sum of the decimal places in the factors.	6.8C 6.8D	2
2	**Which Warehouse?** Volume Composition and Decomposition	A scenario about building a bench is provided. Students review estimating sums and differences of decimals and how to add and subtract decimals by adding or subtracting the digits in like place values. They then determine the volume of the bench, a composite solid, using decomposition into smaller rectangular prisms and composition into a larger rectangular prism. The two different strategies require either addition or subtraction of decimals. Students practice solving problems requiring addition and subtraction of decimal volumes.	• When adding or subtracting decimals, the decimal points must be lined up to ensure like place values are written in the same columns and combined appropriately. • A rectangular prism is a prism that has rectangles as its bases. • A composite solid is made up of more than one geometric solid. • The formula for the volume of a cube is $V = lwh$, where l is the length, w is the width and h is the height, or $V = Bh$, where B is the area of the base and h is the height. • The volume of composite solids is found by adding or subtracting volumes of common solids.	6.3E 6.8D	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**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	2
4	**Dividend in the House** Dividing Whole Numbers and Decimals	In this lesson, students use the standard algorithm for long division with whole numbers. They demonstrate how the algorithm works for decimal dividends by relating it to a model and make sense of why the algorithm is modified to accommodate decimal divisors. Students solve area and volume problems requiring decimal division.	• The long division algorithm is based on an organized estimation process to determine the quotient. • When a quotient has a remainder, the situation informs how to interpret the remainder. • When you have a decimal divisor, multiply it by a power of ten to convert it to a whole number. Then, multiply the dividend by the same power of ten. Because you multiplied both the dividend and divisor by the same power of ten, the quotient will be the same as the quotient of the original problem. • You can use the standard algorithms for whole number and decimal division to solve real-world problems. • Use estimation to determine if the quotient of a division problem is reasonable.	6.3E 6.8D	2
End of Topic Assessment					1

2 Relating Quantities

Topic 1: Ratios

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**It's All Relative** Introduction to Ratio and Ratio Reasoning	Students differentiate between additive and multiplicative reasoning in preparation for the study of ratios. The term *ratio* is defined as *a comparison between two quantities;* ratios employ multiplicative reasoning. Students compare quantities using part-to-part and part-to-whole ratios. They write ratios in words, in colon notation, and in fractional form. They identify fractions and percents as special types of part-to-whole ratios.	• A ratio is a comparison of two quantities. • Ratios can be expressed using words, with a colon, or in fractional form. • A ratio can represent part-to-whole or part-to-part relationships. • Fractions and percents are special types of part-to-whole ratios.	6.4A 6.4C	2
2	**Going Strong** Comparing Ratios to Solve Problems	Students explore ratios in a different real-world situations. They decide which of two or more ratios in each situation is greater using qualitative and quantitative reasoning. Students compare part-to-part and part-to-whole ratios represented pictorially, verbally, and numerically. The focus in this lesson is on reasoning rather than on computation.	• A ratio is a comparison of two quantities. • Qualitative comparisons are made in the absence of numeric values.	6.4B 6.4C	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Oh, Yes, I Am the Muffin Man** Determining Equivalent Ratios	Students are introduced to formal strategies to determine equivalent ratios, including pictures, strip diagrams, scaling up/down, and double number lines. They solve a variety of real-world problems using these strategies to create equivalent equations. An example of scaling up ratios is provided, and students use the example to answers questions in various contexts. The definitions of *scaling up* and *scaling down* ratios are provided. Students then determine equivalent ratios by either scaling up or scaling down. A double number line is introduced. They use double number lines to represent the proportional relationship between two quantities and solve for unknown quantities.	• Models are used to represent ratio relationships and to solve real-world problems. • A ratio is a comparison of two quantities. • A rate is a ratio that compares two quantities that are measured in different units. • When two rates or ratios are equal to each other, they can be written as a proportion. • A proportion is an equation that states two ratios are equal. • When writing a proportion, the numbers representing the same quantity must be placed in both numerators or in both denominators. The unit of measurement must be consistent among the ratios. • Scaling up means to multiply both part of a ratio by the same scale factor greater than 1, or divide both parts of a ratio by the same scale factor less than 1. • Scaling down means to divide both parts of a ratio by the same factor greater than 1, or multiply both parts of a ratio by the same scale factor less than 1. • A double number line is a model that is made up of two number lines used to represent the equivalence of two related numbers. The intervals on each number line maintain the same ratio.	6.4B 6.4E 6.5A	3
4	**A Trip to the Moon** Using Tables to Represent Equivalent Ratios	Students use tables in different ways to determine equivalent ratios. They multiply or divide existing ratios by a common factor to determine equivalent ratios in a table, just as they did in scaling. Students learn that existing ratios in a ratio table can be added to form new equivalent ratios. They then complete equivalent ratio tables for different proportional situations.	• Ratios are used to represent proportional relationships in the real world. • Equivalent ratios are generated within the context of a situation using addition, subtraction, multiplication, and division.	6.4B 6.4D 6.5A	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
5	**They're Growing!** Graphs of Ratios	Students investigate rectangles with a common ratio of side lengths and those with a constant difference in side lengths. They graph the dimensions of the rectangles on a coordinate plane and conclude that equivalent ratios represented on the coordinate plane form a straight line that passes through the origin. Students analyze a ratio that is represented using a table, double number line, and coordinate plane. The models are connected and used to solve real-world problems.	• Equivalent ratios can be represented by tables, double number lines, and on coordinate planes. • A ratio $\frac{y}{x}$ is plotted as the ordered pair (x, y). • Equivalent ratios represented on the coordinate plane form a straight line that passes through the origin.	6.4E 6.5A 6.6C	2
6	**One is Not Enough** Using and Comparing Ratio Representations	Graphs and double number lines of real-life situations are given. Students interpret the points on the graphs in terms of the problem situation. They determine unknown ratios using either a specified strategy or the strategy of their choice. Students also contrast representations of additive and multiplicative relationships. Students then create a graphic organizer to show how equivalent ratios can be modeled through four representations: scale up/scale down, tables, double number lines, and graphs.	• Equivalent ratios represented by tables, double number lines, and on coordinate planes can be used to solve real-world and mathematical problems. • Equivalent ratios represented on the coordinate plane form a straight line that passes through the origin.	6.5A 6.6C	3
End of Topic Assessment					1

Topic 2: Percents

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**We Are Family!** Percent, Fraction, and Decimal Equivalence	Students learn about the relationships between percents, fractions, and decimals. In the first activity, students analyze the results of a survey of one hundred students. They complete a table by writing the ratio, fraction, and decimal equivalences for each result. Students use hundredths grids to model the result, and they then write the percent equivalence. They are reminded that percents are special types of part-to-whole ratios. *Percent* is described as a fraction in which the denominator is 100 and the % symbol represents the phrase "out of 100." Students write numbers in equivalent forms and use number lines to indicate the equivalent fraction, decimal, and percent represented by the markers on the number line. They analyze reasoning about combining ratios into an overall percent. They then play a percentage match game to identify equivalent representations. A chart is provided in the summary to highlight common fraction, decimal, and percent equivalents.	• Percent is a part-to-whole ratio with a whole of 100. The symbol "%" means "out of 100." • The hundredths grid can be used to represent a fraction, decimal, or percent. • To write a fraction as a percent, scale up or down to an equivalent fraction with a denominator of 100, if possible. • To write a fraction as a percent, divide the numerator by the denominator and move the decimal in the quotient two places to the right.	6.4E 6.4F 6.4G 6.5C	2
2	**Warming the Bench** Using Estimation and Benchmark Percents	Students begin the lesson building fluency with ordering fractions, decimals, and percents. They then estimate the percent of cylinders, circles, and squares that are partially shaded. Students write estimates as fractions, decimals, and percents. *Benchmark percents* are introduced to help students mentally estimate the value of a percent. They then use calculators to investigate the values of 1% and 10% of several numbers. Students write rules about moving the decimal two places to the left to determine 1% of any number and moving the decimal one place to the left to determine 10%. Various scenarios are presented in which students are asked to estimate and calculate percents.	• Percent is a fraction in which the denominator is 100. The symbol "%" means "out of 100." • A benchmark percent is a percent that is commonly used, such as 1%, 5%, 10%, 25%, 50%, and 100%. • Calculating 1% of any number is the same as moving the decimal point two places to the left. • Calculating 10% of any number is the same as moving the decimal point one place to the left. • Benchmark percents can be used to perform mental estimation and calculation of percents.	6.2D 6.4E 6.4F 6.4G	2
3	**The Forest for the Trees** Determining the Part and the Whole in Percent Problems	Percent problems involve three quantities: the part, the whole, and the percent. In this lesson, students solve for the percent, given the part and the whole, and solve for the whole, given the percent and the part. They set up a proportion where the percent, if known, is written as a fraction with a denominator of 100. They then determine the unknown, using multiplication.	• Percent problems involve three quantities: the part, the whole, and the percent. • When calculating the whole, given the percent and the part, write the percent as a fraction with a denominator of 100 and set it equal to the part over x. Then solve for x.	6.4G 6.5B	2
		End of Topic Assessment			1

TEXAS MATH SOLUTION

Topic 3: Unit Rates and Conversions

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Several Ways to Measure** Using Ratio Reasoning to Convert Units	Students deepen their understanding of converting units of measurement through the use of ratio reasoning and strategies for determining equivalent ratios. The term *convert* is defined, and students use approximate conversion rates to estimate measurement conversions before engaging with formal methods of converting. Converting among units of measurement in the same system is recast in terms of conversion ratios, which can also be called conversion rates. Students use ratio reasoning and strategies to convert within the U.S. customary system and the metric system. Students use double number lines, ratio tables, and scaling up and down to convert units of measurement. They analyze Worked Examples of the different strategies. For scaling up and down, students explain why one conversion ratio is more appropriate than the other. Finally, students are introduced to unit or dimensional analysis as a strategy for converting between units of measurement. They practice using unit analysis in problems about distance, money, and area. Students make choices about which strategy to use when converting between units of measurement.	• When a smaller unit of measure is converted to a larger unit of measure, the larger unit of measure has fewer units. • When a larger unit of measure is converted to a smaller unit of measure, the smaller unit of measure has more units. • All of the strategies used to determine equivalent ratios (double number lines, ratio tables, scaling up and down) can be used to convert between units. • Unit analysis is a strategy for converting units that ensures the correct calculations and units in the final result.	6.4H 7.4E	2
2	**What Is the Best Buy?** Introduction to Unit Rates	*Unit rates* are introduced. Students utilize models to estimate unit rates two different ways. They compare the different methods and conclude that both methods lead to correct solutions. Students write unit rates that compare the same quantities in two different ways. They then use unit rates to determine the best buy. Students compute unit rates to make comparisons about loaves of bread per person at a dinner, speed of runners, baking times, cafeteria milk sales, and the speed of buses. Finally, they complete problems about constant speeds and determining multiple numbers of various items.	• A rate is a ratio in which the two quantities being compared are measured in different units. • A unit rate is a comparison of two measurements in which the denominator has a value of one unit. • Unit rates are used to calculate best buys. • Unit rates are used to make comparisons involving rates.	6.4B 6.4D 7.4B	3
3	**Seeing Things Differently** Multiple Representations of Unit Rates	Students use what they know about unit rates to further develop flexible thinking and problem solving with unit rates in different situations using a variety of representations, including tables and graphs. The lesson begins with students investigating a speedometer as a double number line. Students then reason with unit rates in various mathematical and real-world situations, including measuring the diagonals of a Golden Rhombus and investigating the speed of the Duquesne Incline. Finally, students demonstrate their learning by creating a situation of their own to represent the graph of equivalent rates.	• Equivalent rates can be represented through tables, double number lines, and on coordinate planes. • Points on a straight line that passes through the origin describe equivalent rates. • Unit rates are helpful when making comparisons.	6.4D 6.5A 7.4A	2
End of Topic Assessment					1

3 Moving Beyond Positive Quantities

Topic 1: Signed Numbers and the Four Quadrants

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.C, 5.D, 5.E

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Human Number Line** Introduction to Negative Numbers	Students extend their knowledge of number to the negatives by building on prior knowledge of ordering positive rational numbers and plotting them on a number line. Students learn that *opposite* on a number line means to reflect over the origin. They also learn that the negative sign is used as notation for opposites. Students explain the meaning of 0, positive numbers, and negative numbers in a variety of contexts.	• Positive and negative numbers describe quantities having opposite directions or values. • Positive and negative numbers are used in real-world situations. • Zero has different meanings in different real-world situations.	6.2C 6.2D	2
2	**Magnificent Magnitude** Absolute Value	Students formalize the idea that opposites are the same distance from zero and call this distance the absolute value of a number. Students continually revisit the meaning of absolute value, focusing on distance from 0. Students evaluate absolute value statements and compare numbers using absolute values. Students solve problems using absolute value statements.	• The distance from zero is the absolute value, or magnitude, of a rational number. • Absolute values are used to describe real-world situations. • Absolute value equations are used to compute distance on a number line.	6.2B	2
3	**What's in a Name?** Rational Number System	Students formally classify numbers as rational numbers and understand that all numbers they have studied so far are subsets of the rational numbers. Students sort and classify numbers. They investigate the density of rational numbers by locating rational numbers between other rational numbers.	• Rational numbers are the set of numbers that can written as $\frac{a}{b}$ where *a* and *b* are integers and b does not equal 0. • The set of rational numbers includes the sets of integers, whole numbers, and natural numbers. • Given two rational numbers, there exists an infinite number of rational numbers between those numbers.	6.2A 6.2C 7.2A	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
4	**Four Is Better Than One** Extending the Coordinate Plane	Students build from working with rational numbers on a number line to rational numbers on a coordinate plane. They identify the four quadrants, identify points, and make generalizations about points located in given quadrants. Students determine distances between two points that have a common coordinate.	• The coordinate plane is used to plot ordered pairs of rational numbers. • The coordinate plane has 4 quadrants that are named with Roman numerals. • The relationship between two ordered pairs differing only by signs is a reflection across one or both axes. • Absolute value equations are used to determine the distance between two points that share an *x*-coordinate or a *y*-coordinate.	6.11A	3
5	**It's a Bird, It's a Plane… It's a Polygon on the Plane!** Graphing Geometric Figures	Students apply their knowledge of plotting ordered pairs in all four quadrants to graphing and solving problems with geometric figures on the coordinate plane. Students begin with plotting and determining perimeters and area of polygons. At the end of the lesson, students engage in problem solving with coordinates in multiple quadrants to help design a playground.	• Absolute value equations are used to determine area and perimeter of polygons plotted on the coordinate plane. • Polygons drawn on the coordinate plane can be used to solve real-world and mathematical problems.	6.11A	2
End of Topic Assessment					1

Topic 2: Operating with Integers

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Math Football** Using Models to Understand Integer Addition	A math football game is used to model the sum of positive and negative integers. Rules for the game and a game board are provided. Students use number cubes to generate the integers. They then take that same information and write integer number sentences.	• A model can be used to represent the sum of a positive and negative integer, two negative integers, or two positive integers. • Information from a model can be rewritten as an equation.	6.3C	1
2	**Walk the Line** Adding Integers, Part I	A number line is used to model the sum of two integers. Students begin the lesson by walking a number line on the floor of the classroom. Through a series of activities, students will notice patterns for adding integers. After the kinesthetic activity, students examine a Worked Example and then practice calculating sums of positive and negative numbers using a number line model. Questions focus students on the distance an integer is from 0 on the number line, or the absolute value of the integer, to anticipate writing a rule for the sum of two integers having different signs. Students demonstrate their understanding of the patterns by writing informal rules for adding integers. Finally, they use a number line model to determine unknown values in equations.	• On a number line, when adding a positive integer, move to the right. • On a number line, when adding a negative integer, move to the left. • When adding two positive integers, the sign of the sum is always positive. • When adding two negative integers, the sign of the sum is always negative. • When adding a positive and a negative integer, the sign of the sum is the sign of the number that is the greatest distance from zero on the number line.	6.3C 6.3D	2
3	**Two-Color Counters** Adding Integers, Part II	Through a series of activities with two-color counters, students will develop rules for adding integers. Students determine that to have a sum of zero, two integers must have opposite signs but the same absolute value. Examples of modeling the sum of two integers with opposite signs using two-color counters are provided. The counters are paired together, one positive counter with one negative counter, until no possible pairs remain. The resulting counters determine the sum of the integers. Several models are given and students write a number sentence to represent each model. Students critique reasoning about using the two-color counters to model adding integers. They draw models for given number sentences and create number sentences for given models. They create a graphic organizer to represent the sum of additive inverses using a variety of representations.	• Opposite quantities in real-life situations combine to make 0. • Two numbers with the sum of zero are called additive inverses. • When two integers have the same sign and are added together, the sign of the sum is the sign of both integers. • When two integers have opposite signs and are added together, the integers are subtracted and the sign of the sum has the sign of the integer with the greater absolute value.	6.3C 6.3D	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
4	**What's the Difference?** Subtracting Integers	Number lines and two-color counters are used to model subtraction of signed numbers. Through a series of activities, students will develop rules for subtracting integers. As in the lesson on adding signed numbers, the number line method is used to model the difference between two integers. Students then learn how to use zero pairs when performing subtraction using the two-color counter method. Students analyze real-world situations that require calculating the distance between two signed numbers. They build on what they already know about absolute value to determine the distance.	• Opposite quantities in real-life situations combine to make 0. • Two numbers with the sum of zero are called additive inverses. • When two integers have the same sign and are added together, the sign of the sum is the sign of both integers. • When two integers have the opposite sign and are added together, the integers are subtracted and the sign of the sum is the sign of the integer with the greater absolute value.	6.3C 6.3D 7.3A	2
5	**Equal Groups** Multiplying and Dividing Integers	Two-color counters and number lines are used to model the product of two integers. Through a series of activities, students develop rules to determine the sign of a product or quotient of two integers. They conclude that multiplying or dividing two positive integers or two negative integers always results in a positive product or quotient, and that multiplying or dividing a positive integer by a negative integer always results in a negative product or quotient. Questions focus students on the sign of a product resulting from the multiplication of two positive integers, two negative integers, and one positive and one negative integer. Students apply this knowledge to determine the sign of the product that results from multiplying three or more integers.	• Multiplication of integers can be modeled using a number line or two-color counters. • The product that results from multiplying two positive integers is always positive. • The product that results from multiplying two negative integers is always positive. • The product that results from multiplying a negative integer and a positive integer is always negative. • The product that results from multiplying an odd number of negative integers is always negative. • The product that results from multiplying an even number of negative integers is always positive. • Division and multiplication are inverse operations.	6.3C 6.3D	2
End of Topic Assessment					1

Topic 3: 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

Lesson	Lesson Title	Lesson Overview	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.	• 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.	7.2A 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	Lesson Overview	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

4 Determining Unknown Quantities

Topic 1: Expressions

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Relationships Matter** Evaluating Numeric Expressions	Students write and simplify numeric expressions. The terms *power, base, exponent, perfect square, perfect cube,* and *Order of Operations* are defined. Students create numeric expressions to represent geometric models and draw geometric models to represent numeric expressions. Students learn that an expression represents a relationship between quantities, rather than a recipe to perform operations on values. Students conclude the lesson by applying the Order of Operations to simplify numeric expressions.	• A numeric expression is a mathematical phrase containing numbers. • To simplify a numeric expression means to calculate an expression to get a single value. • Parentheses are symbols used to group numbers and operations, and they are used to change the normal order in which operations are performed. • The Order of Operations is a set of rules that ensures the same result every time an expression is simplified. 1. Simplify expressions inside parentheses or grouping symbols such as ( ) or [ ]. 2. Simplify terms with exponents. 3. Multiply and divide from left to right. 4. Add and subtract from left to right.	6.3D 6.7A 6.7B	2
2	**Into the Unknown** Introduction to Algebraic Expressions	Students write algebraic expressions and evaluate numeric expressions. They practice writing algebraic expressions for mathematical word sentences, and then reverse the process. Students decompose given algebraic expressions by stating the number of terms in each algebraic expression and listing the terms. Students conclude the lesson by evaluating algebraic expressions individually and in table form. Finally, they practice composing algebraic expressions from verbal phrases written with mathematical terminology.	• A variable is a letter or symbol used to represent quantities. • An algebraic expression is a mathematical phrase involving at least one variable and sometimes numbers and operation symbols. • Situations can be expressed using algebraic expressions. • A numerical coefficient is a number, or quantity, that is multiplied by a variable in an algebraic expression.	6.3D 6.7D	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Second Verse, Same as the First** Equivalent Expressions	Students consider a situation about packing two suitcases for a camping trip and then combining the contents of the suitcases to motivate the need to combine like terms in algebraic expressions. Students model and simplify algebraic expressions first by using algebra tiles to make sense of combining like terms and then by using the rules and properties. Algebra tiles are then used as a method to make sense of the Distributive Property. Students rewrite expressions using the Distributive Property, the Order of Operation Rules, and combining like terms. Then students use algebra tiles to apply the distributive property to division problems. Finally, students rewrite expressions as a product of two factors.	• Algebra tiles are a helpful tool to make sense of rewriting algebraic expressions. • Like terms are two or more terms that have the same variable raised to the same power. • The Distributive Property states that if a, b, and c are any real numbers, then $a(b + c) + ab + ac$. Because subtraction is a special form of addition and division is a special form of multiplication, the Distributive Property can also be expressed as $a(b - c) = ab - ac$, $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$, and $\frac{a-b}{c} = \frac{a}{c} - \frac{b}{c}$. • An algebraic expression can be written as the product of two factors by applying the Distributive Property.	6.7B 6.7C 6.7D	2
4	**Are They Saying the Same Thing?** Verifying Equivalent Expressions	Students begin by reviewing the properties of arithmetic and algebra that they have formally or informally studied in the past. This allows students to use properties as they rewrite algebraic expressions in equivalent forms. Students analyze pairs of expressions. They use properties, tables, and graphs to show that the expressions are or are not equivalent. Students compare the algebraic expressions and are asked to use tables and graphs to determine if they equivalent. This opens the discussion that one non-example is necessary to disprove a claim, while an infinite number of examples are necessary to prove a claim.	• The Commutative Properties of Addition and Multiplication state that the order in which you add or multiply two or more numbers does not affect the sum or use the product. • The Associative Properties of Addition and Multiplication state that changing the grouping of the terms in an addition or multiplication problem does not change the sum or product. • The Distributive Property states that if a, b, and c are any real numbers, then $a(b + c) = ab + ac$. Because subtraction is a special form of addition and division is a special form of multiplication, the Distributive Property can also be expressed as $a(b - c) = ab - ac$, $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$, and $\frac{a-b}{c} = \frac{a}{c} - \frac{b}{c}$. • Two algebraic expressions are equivalent expressions if, when the same value is substituted for the variable into each expression, the results are equal. • Two algebraic expressions can be proven to be equivalent by: (1) using the properties of numbers and operations to simplify them until they are written the exact same way; and (2) graphing each expression on the same graph to determine if their graphs are the same.	6.7C 6.7D	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
5	**DVDs and Songs** Using Algebraic Expressions to Analyze and Solve Problems	Students practice writing algebraic expressions and using those expressions to solve problems. In the first problem, they write four different sets of algebraic expressions to represent the same situation, each time basing their expressions upon a different initial variable representing a different varying quantity in the problem. Students use the algebraic expressions to answer other questions about the same situation. The second problem is set up the same way as the first problem, the only differences being the context, the number of relationships described in the problem, a minor change in the way the relationships are described, and the number of algebraic expressions students are asked to write. Students then use equivalent expressions to explain why a number trick works and then they create their own number trick.	• Many real-life situations can be represented using algebraic expressions. The algebraic expressions can then be used to answer questions about the situation. • Different algebraic expressions may represent the same real-life situation depending upon what the initial variable represents.	6.7B 6.7C 6.7D	1
End of Topic Assessment					1

TEXAS MATH SOLUTION

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**No Substitute for Hard Work** Evaluating Algebraic Expressions	Students review variables, algebraic expressions, and evaluating 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	1
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	2
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	2
End of Topic Assessment					1

Topic 3: Equations and Inequalities

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, 3.H, 3.I, 4.A, 4.B, 4.C, 4.G, 4.K, 5.E

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**First Among Equals** Reasoning with Equal Expressions	Students learn that an equation is a mathematical sentence created by equating two expressions. They create equations from a list of expressions and determine the solutions to their equations using substitution. Students learn that equations may have one solution, no solution, or infinite solutions. Students use Properties of Equality to write equations that have the same solution as a given equation. They identify the Zero Property of Multiplication, the Identity Property of Multiplication, and the Identity Property of Addition. Students are introduced to algebraic inequalities by analyzing their graphs and solution sets, including inequalities of the form $x > c$ and $x < c$. Students write inequalities represented on a number line and graph the solution sets of other algebraic inequalities. Then, they consider how many solutions an inequality may have.	• A solution to an equation is any value for a variable that makes the equation true. • The Properties of Equality state that if the same operation is performed on both sides of the equation, then equality is maintained. • The graph of an inequality in one variable is the set of all points on a number line that make the inequality true. • The solution set of an inequality is the set of all points that make the inequality true.	6.3D 6.7D 6.9A 6.9B	3
2	**Bar None** Solving One-Step Addition Equations	Students use bar models to solve a variety of one-step addition equations. They analyze Worked Examples and analyze solution strategies to develop an understanding of using bar models to solve addition equations. The term *inverse operations* is defined. Students use properties of arithmetic and algebra to solve addition equations without using models. They eventually use the Subtraction Property of Equality to solve a variety of addition equations where the solutions also include integers. Finally, students summarize how to solve and check one-step addition equations.	• A one-step equation is an equation that can be solved using only one operation. • A solution to an equation is any value for a variable that makes the equation true. • To solve an equation, you must isolate the variable by performing inverse operations. • The Properties of Equality state that if you perform the same operation on both sides of an equation, then equality is maintained.	6.3D 6.9A 6.10A	1
3	**Play It In Reverse** Solving One-Step Multiplication Equations	Students reason about and solve a variety of one-step multiplication equations of the form $px = q$, where p, x, and q are nonnegative rational numbers. They first analyze Worked Examples and create bar models to understand the structure of equations in this form and reason about their solutions. Through composition and decomposition to isolate the variable using bar models, students are primed to formalize their strategies using inverse operations and Properties of Equality. Students then solve multiplication equations without using models and provide justification for their solution strategies. To deepen their understanding to reason about solutions, they rewrite equations with two variables to see structural similarities between these equations and the one-variable equations they solved throughout the lesson. Finally, students analyze a set of equations and determine the most efficient solution strategy based on the form of the multiplication equation.	• A solution to an equation is any value for a variable that makes the equation true. • A one-step equation is an equation that can be solved using only one operation. • To solve an equation, you must isolate the variable using Properties of Equality. • The Properties of Equality state that if you perform the same operation on both sides of an equation, then equality is maintained.	6.9A 6.10A	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
4	**The Real Deal** Solving Equations to Solve Problems	Students solve a variety of real-world and mathematical problems that can be modeled by one-step equations. They are introduced to literal equations and use the skills learned in the previous lesson to solve them. Students are then presented with a set of rather direct statement problems as a way to introduce a mathematical structure (defining variables, writing an equation, solving the equation, and interpreting the solution) to solve real-world problems. This activity is followed by a set of problems that are not as straightforward in nature, requiring the use of area formulas.	• A mathematical framework can be used to solve real-world problems. • Variables can be used to represent quantities in expressions describing real-world values. • Equations can be used to model relationships between variables. • To solve an equation, you must isolate the variable by performing inverse operations.	6.8C 6.9A 6.9C 6.10A 6.10B	1
5	**Greater Than Most** Solving Inequalities with Inverse Operations	Students solve inequalities and graph the solutions on number lines. They use empirical examples to informally state the Properties of Inequalities. Students solve a variety of one-step inequalities. Attention is also given to verifying the solution to an inequality. They then solve two-step inequalities algebraically and graph their solutions. Attention is given to verifying the accuracy of the solutions. Finally, students write their own real-world scenarios given three inequality statements.	• An inequality is any mathematical sentence that has an inequality symbol such as $>$, $<$, $\geq$, or $\leq$. • The graph of an inequality with one variable is the set of all points on a number line that make the inequality true. • The solution set of an inequality is the set of all points that make the inequality true. • The inequality symbol remains the same when adding, subtracting, multiplying, or dividing an inequality by a positive number. • The inequality symbol reverses when multiplying or dividing an inequality by a negative number.	6.9A 6.9B 6.9C 6.10A 6.10B	2
End of Topic Assessment					1

Topic 4: Graphing Quantitative Relationships

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Every Graph Tells a Story** Independent and Dependent Variables	Students create scenarios to match numberless graphs in which the axes are labeled.They then cut out graphs and match them with the appropriate scenario. Students will then label the axes and analyze the graphs based on their prior knowledge, including ratio relationships and using inequality statements to represent constraints in problem situations. They determine how one quantity depends on another using scenarios, equations, and graphs. Students then identify independent and dependent quantities and represent those quantities using variables. They write an equation, complete a table of values, and create a graph to model the situation. Finally, students analyze two situations in which the independent and dependent quantities are reversed to understand that the question being asked often determines which is the independent quantity and which is the dependent quantity.	• Graphical representations are used to solve problems. • Graphs represent the relationships between independent and dependent quantities. • When one quantity is determined by another in the problem situation, it is said to be the *dependent quantity*. The varaible representing the dependent quantity is the dependent variable. • When one quantity is not determined by another in the problem situation, it is said to be the *independent quantity*. The variable representing the independent quantity is the independent variable. • The independent variable is located on the x-axis and the dependent variable is located on the y-axis. • When writing an equation, it can be helpful to isolate the dependent variable to more clearly see the relationship between quantities.	6.6A 6.6B 6.6C	2
2	**The Power of the Horizontal Line** Using Graphs to Solve Problems	Students determine unknown values for a scenario and use the values to write a one-step multiplication equation to represent the scenario. They then analyze the graph of the equation, interpreting ordered pairs on the graph and determining the unit rate. Students use the graph to determine the value of an independent quantity, a horizontal line graphed at the value of the dependent variable. They then answer a variety of questions about the scenario; some answers are single solutions and some include a range of values (inequality statements). Given a scenario, students analyze the graph of the scenario and write an equation to represent the scenario. Students then must decide when to use the graph and when to use the equation to answer a variety of questions about the scenario. Finally, students compare equations and graphs that represent additive and multiplicative relationships. Students write equations for the graphs and explain how to use a graph to solve one-step equations.	• Multiple representations such as words, tables, equations, and graphs are used to solve problems of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all nonnegative rational numbers. • A solution to an equation is any value for a variable that makes the equation true. • A solution to an equation represented on a graph is any point on the line. • An inequality of the form $x > c$ or $x < c$ can be used to represent constraints when solving a real-world problem.	6.6A 6.6B 6.6C	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Planes, Trains, and Paychecks** Multiple Representations of Equations	In this lesson, students analyze equations in a variety of different forms—represented in tables, graphs, in word problems, and as algebraic equations. They solve problems using these multiple representations of equations. Students continue to explore discrete and continuous quantities.	• Multiple representations, such as words, tables, equations, and graphs are used to solve problems. • Graphs can be characterized as being continuous or discrete based upon the scenario they model and the units of the independent and dependent variables.	6.6A 6.6B 6.6C	2
4	**Time for Triathlon Training** Relating Distance, Rate, and Time	Students analyze and solve problems about competing in triathlons to investigate the relationship between distance, rate, and time. In each activity, students analyze the rate for a specific segment of the triathlon. Each activity begins with either a graph, table, or given rate. Students create, use, and analyze graphs, equations, and tables. Finally, students write that each activity used a form of the equation $d = rt$, where rate is distance traveled divided by time.	• Graphical representations are used to solve problems. • Multiple representations such as words, tables, equations, and graphs are used to solve problems of the form $px = q$ for cases in which p, q, and x are all nonnegative rational numbers. • The equation $d = rt$, where d represents the distance traveled, r represents the rate of the distanced traveled to the time, and t represents the time, can be used to solve a variety of real-world problems.	6.6A 6.6B 6.6C	1
5	**There Are Many Paths...** Problem Solving on the Coordinate Plane	Students apply their knowledge of plotting and interpreting rational numbers on the coordinate plane, creating tables of values, and writing and solving equations to solve a variety of problems. They model real-life situations, analyze data, and select which representation to use for specific problems.	• Multiple representations such as situations written in words, equations, tables, and graphs can be used to solve problems. • Graphs other than lines can be used to model real-life situations. • Graphs can be used to interpret data and analyze changes in data. • There are advantages and disadvantages to using different mathematical tools to solve problems.	6.6A 6.6C 6.11A	4
End of Topic Assessment					1

Topic 5: Financial Literacy: Accounts, Credit, and Careers

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**Knowledge You Can Bank On** Checking Accounts	Students are exposed to a checking account. They analyze the components of a check and write checks. They interact with a checkbook register by completing the balance column. The basics of reconciling a bank statement are introduced by comparing a portion of a checkbook register to a portion of a bank statement. The terms *account balance, deposit, withdrawal, debit* and *transfer* are defined. The concept of an overdraft is explained and an example is provided. Students then discover the costs and possible earnings involved in having a checking account. They compare checking accounts based upon the monthly fees, APY, and required minimum average balance to decide which account would be most appropriate.	• A checking account allows customers to safely store money in the bank and write checks against the money that they deposit. • A statement is a monthly summary of the account balance on the checking account, including all transactions that occur during a given time period. It allows the customer to check their records against the bank's records. • A customer may have to pay money to have a checking account. The bank may charge a monthly fee just to have the account. Sometimes customers are required to keep a minimum amount of money in their account at all times. All banks charge a fee for overdrafts. • A customer may earn money by having a checking account. Some banks offer an annual percentage yield (APY); this is a small percentage of interest based upon the customer's account balance.	6.14A 6.14C	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
2	**You Are a Real Card!** Debit Cards vs. Credit Cards	Students compare and contrast the key characteristics of debit cards and credit cards. They practice for understanding when a characteristic is provided, and they must determine if it applies to debit cards, credit cards, or both. They investigate credit cards in more depth as they deal with the financial advantages of rewards programs and the financial disadvantages of annual fees and interest rates. Students use mathematics to see the increased cost of paying using credit cards over time. Students are introduced to the concepts of interest and interest rate. They investigate what happens if you pay only the minimum payment on your credit card balance. Students then determine the interest paid each month for given scenarios. Finally, they give advice to a customer who is looking to pay off his credit card. The lesson ends with students again completing an activity choosing a debit card, credit card, or both, but this time they are given situations rather than characteristics, and they must apply their knowledge of the different types of cards. Then, students have a discussion of the advantages and disadvantages of both debit and credit cards.	• Debit cards are issued by the bank when a customer opens a checking account. When a customer buys an item using a debit card, the money is taken directly from their checking account. The amount of money the customer can spend is limited to the balance in their checking account. • Credit cards are issued by a company when a customer applies to a financial/credit card company. When a customer buys an item using a credit card, they can make the purchase whether they currently have the money for it or not. The credit card company then bills the customer allowing them to pay over time. The amount of money the customer can spend is based upon the limit the credit card company provides. • There are advantages to having a credit card. A customer can make a purchase without having the money available. Credit card companies offer rewards programs for using their cards. Also, for security purposes, the customer must sign each time they use the card. If the card is lost or stolen and used fraudulently, the customer is not responsible to pay for that illegal use of the card. • There are disadvantages to having a credit card. A customer might make purchases they cannot afford. The credit card companies may charge an annual fee to have the card, and all credit card companies charge interest on any bill not paid in full at the end of each month. • There are advantages to having a debit card. A customer can make a purchase just as if they were paying with cash, but they do not have to carry cash with them. Also, because the customer must have the funds available to make the purchase, there are limits to their ability to overspend. • There is a disadvantage to using a debit card. For security purposes, the customer must enter a personal identification number (PIN) each time they use the card. However, if the card is lost or stolen and used fraudulently, the customer may not be able to recover the funds lost.	6.14A 6.14B	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Financial Report Card** Understanding Credit Reports	Students learn what a credit report is and why the credit score listed in the report is important. The credit score determines: (1) if the person qualifies for a loan, (2) the amount of money they can borrow, and (3) the interest rate for the loan. Students research what is included in a credit report. They discuss the range of credit scores, the importance of a good credit score, and how to maintain a good credit score. Students interact with a circle graph to see what factors have the most impact on a credit score. They estimate the percent of each factor from the circle graph, rather than solving for the percents mathematically. They apply this information by ranking statements about a person's credit report, connecting the data from the statements to a factor that affects a credit score, and then ranking the statements according to their importance in determining a credit score. The lesson concludes with a brief discussion of how to earn a good credit score and the importance of having a positive credit report.	• A credit report is a detailed listing of an individual's credit history, along with a credit score. • A credit score is a number used by lenders to rate how likely a person is to repay their debts. The credit score determines: (1) if the person qualifies for a loan, (2) the amount of money they can borrow, and (3) the interest rate for the loan. • It is important for individuals to have and maintain a good credit score, so that they can qualify for loans for a reasonable amount of money at a low interest rate. • A good credit score is obtained by paying bills on time and avoiding having too much debt.	6.14D 6.14E 6.14F	1
4	**The Possibilities Are Endless** Career Exploration	This lesson addresses career choice primarily from an educational and financial perspective. Students begin by completing a survey reflecting upon their areas of strength and areas in need of improvement regarding study habits as a catalyst for the discussion that doing well in school is the most powerful thing they can do now to increase their career options as adults. The next activity in the lesson helps students come to the understanding that the more education or training a person receives, the greater their potential earning power. Different post-secondary education degrees are defined, and a table comparing the financial benefits of having each of the degrees is provided. Students apply the information in the table and their knowledge of percents to compare incomes of jobs requiring different levels of education. Students further investigate the finances of a career choice by taking into account both the potential earning power of having an increased level of education, and the cost of student loans to acquire that level of education. They are given personal scenarios and calculate the individual's total earnings over a period of years.	• The more education or training that you receive, the greater your potential earning power. • When considering the finances of a career choice, one must take into account both potential earning power of having an increased level of education, and the cost to acquire that level of education.	6.14H	1

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
5	**Student Aid 101** Paying for College	*Tuition* is defined, and the methods to fund tuition, such as personal savings, grants, scholarships, and work-study programs are explained. Students then research different scholarships and how to locate grant money. Next, students are given personal scenarios that include the cost of tuition, financial aid, scholarships, work-study opportunities, and grants. They use mathematics to determine the amount of the given financial aid packages and how each package offsets the cost of tuition in order to make financial decisions. Next, the difference in tuition costs for a private school and a public school are explained, as well as the financial benefit for attending a school in-state. Students use mathematics to make comparisons of college tuition based upon in-state and out-of-state rates. The lesson concludes with students putting together all that they have learned in this topic. Each student chooses the career(s) that interests them. Students use their chosen career(s) to: (1) describe the post-secondary education required, (2) estimate the cost of tuition, (3) determine a possible average salary, (4) estimate the lifetime income, and (5) determine the average starting salary. Students also address in a general sense how to finance a college education.	• Tuition cost is one of the many factors to consider when selecting an appropriate post-secondary school. • Students pay for college tuition in a variety of ways, including personal savings, grants, scholarships, work-study programs, and/or student loans. • Once a student is accepted into a post-secondary institution, the institution proposes a financial aid package. The financial aid package includes a combination of scholarships, grants, and/or work-study programs that the student can use to offset the cost of tuition. • The financial aid package may not cover the entire cost of tuition, so the student is responsible to pay the remaining portion of the tuition through savings, student loans, and funds from a part-time job. The student can also pursue additional scholarship opportunities on their own.	6.14G	1
End of Topic Assessment					1

5 Thinking Proportionally

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

Lesson	Lesson Title	Lesson Overview	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 distances and compare the ratio of the circumference to the length of the diameter. 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

TEXAS MATH SOLUTION

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

Lesson	Lesson Title	Lesson Overview	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	1
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 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

TEXAS MATH SOLUTION

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

Lesson	Lesson Title	Lesson Overview	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 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, non-linear. Students classify the groups of represetnations 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	2
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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Fish-Inches** Identifying the Constant of Proportionality in Graphs	In this lesson, students analyze real-world and mathematical situations, both proportional and non-proportional, represented on graphs and then identify the constant of proportionality when appropriate. 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	1
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 the situation. A proportional relationship may initially be expressed using only words, or a table of values, or 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

Topic 4: 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

Lesson	Lesson Title	Lesson Overview	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 x 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	2

Lesson	Lesson Title	Lesson Overview	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
4	**More Ups and Downs** Percent Increase and Percent Decrease	Definitions are given for *percent increase* and *percent decrease*. Students will 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	2
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	3
End of Topic Assessment					1

Topic 5: 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

Lesson	Lesson Title	Lesson Overview	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, although 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, although 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	Lesson Overview	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
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, 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	2
		End of Topic Assessment			1

6 Describing Variability of Quantities

Topic 1: The Statistical Process

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**What's Your Question?** Understanding the Statistical Process	Students consider a variety of questions and determine which are statistical and which are not. They learn about the statistical process: formulating a question, collecting data, analyzing data, and interpreting the results. Students organize data into two types: categorical and quantitative. Then, they determine whether conducting a survey, performing an experiment, or using an observational study would be the best method to answer each question. Students then conduct a survey in their classroom, interpret bar graphs and circle graphs for categorical data, and create a bar graph or circle graph for their survey data. Given a frequency table for categorical data, students determine relative frequency. Finally, students interpret the results, stating conclusions they can make from their data displays. In subsequent lessons, students will interpret histograms and dot plots for discrete quantitative data and histograms, stem-and-leaf plots, and box plots for continuous quantitative data.	• The statistical process includes formulating a statistical question, collecting data, analyzing the collected data, and interpreting the data in context of the situation. • A statistical question is one that anticipates and accounts for variability in data. • Data can be described as being categorical or quantitative. *Categorical data* is a set of data for which each piece of data fits into exactly one of several different groups or categories. *Quantitative data* is a set for which each piece of data can be placed on a numerical scale. • Data are collected through the use of surveys, observational studies, and experiments. • Categorical data can be displayed in tables, bar graphs, and circle graphs.	6.12D 6.13B	2
2	**Get in Shape** Analyzing Numerical Data Displays	Students examine data organized in a table and interpret a graphical representation of the same data in a dot plot. They interpret another table of data and then construct a dot plot for a given data set. Students then discuss the shape of data displayed in a dot plot and identify other properties such as clusters and gaps in graphs of data. Students examine a stem-and-leaf plot as a graphical representation of a larger data set. They interpret a table of data and create a stem-and-leaf plot for a given data set.	• Dot plots are a type of graph used to represent the frequency of data values using a number line. • Dot plots are used to represent quantitative data, rather than categorical data. They are best suited for a small number of data points. • Data sets have a graphical distribution, which can be described in terms of overall shape and pattern, as well as deviations from the pattern. • Distributions are commonly referred to as symmetric, skewed left, skewed right, or uniform. • Common graphical features include clusters, peaks, gaps, and outliers in the data values. Often a gap in the data is an indicator that the data include an outlier. • Stem-and-leaf plots are a type of graph used to represent and organize data values for a large number of quantitative data.	6.12A 6.12B 6.13A	2

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
3	**Follow Me on Histogram** Using Histograms to Display Data	Students analyze a histogram. They discuss intervals and interpret information from the histogram. Students then convert information from the histogram to a frequency table and compare the two representations. The process is reversed, and students create two histograms beginning with two tables of information. For each table, they convert the information to a frequency table, and finally, to a histogram. At the end of each problem, students summarize the data from the data displays.	• Histograms and bar graphs look very similar. Bar graphs are necessary when the data is categorical. • Histograms are used when the data is numerical; numerical data can be represented continuously in intervals. • The intervals in a histogram must all be the same size. The width of the bar represents the interval. The height of the bar indicates the frequency of values in the interval. • Histograms and frequency tables display the same information. The histogram is a more visual representation of the information.	6.12A 6.12D 6.13A	2
End of Topic Assessment					1

Topic 2: Numerical Summaries of Data

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

Lesson	Lesson Title	Lesson Overview	Essential Ideas	TEKS	Pacing*
1	**In the Middle** Analyzing Data Using Measures of Center	Students analyze and interpret data using the three different measures of center: mode, median, and mean. *Mode* was defined in the previous module, but is now placed in the context of being one of three measures of central tendency. *Median* is defined in the first activity. Students calculate each numerical value and interpret its meaning in terms of a problem situation. Next, students investigate the third measure of center, the mean, in three different ways: by leveling off a set of data values (creating fair shares), by estabilishing a balance point for a set of data values, and by determining the sum of the data values and dividing by the number of data values. In the last activity, students are presented with a real-world problem in which they calculate and interpret each measure of center.	• A measure of center for a data set summarizes all of its values with a single number. • Measures of center are numerical ways of determining where the center of data is located. • Three measures of center are mode, median, and mean. • The *mode* is the data value or values that occur most often in a data set. • The *median* is the data value in the middle of a data set that has been placed in numerical order. • The *mean* can be thought of as leveling off a set of data values, a balance point of a data set placed on a number line, and the sum of the data values divided by the number of data values.	6.12B 6.12C	2
2	**Box It Up** Displaying the Five-Number Summary	Students examine variability in data. They compute the range for a set of data, and practice dividing data sets into quartiles. Students label and interpret the quartiles, and identify and interpret the data which has been divided into different quartiles, called the *five-number summary*. Students calculate the five-number summary and construct its accompanying box-and-whisker plot. They then construct and interpret box-and-whisker plots for a real-world situation. Finally, students analyze two box-and-whisker plots, construct a plot given specific information, and use a box-and-whisker plot to create possible data sets.	• Measures of variability in a data set describe how spread out the data is. • *Quartiles* are values that divide a data set into four parts once the data is arranged in ascending order. • The five-number summary for a data set consists of the minimum value, the first quartile (Q1), the median (Q2), the third quartile (Q3), and the maximum value of the data set. • The *interquartile range*, or IQR, is the the difference between the first and third quartiles (Q3 − Q1). • A box plot is another way to display numerical data on a number line. It displays the five-number summary and the interquartile range.	6.12A 6.12B 6.12C 6.13A	2
3	**Dealing with Data** Collecting, Displaying, and Analyzing Data	Students organize data into two types, categorical and quantitative. Quantitative data is further divided into discrete, continuous, and two-variable data. Students will interpret graphs that represent all data types. They interpret bar graphs and percent bar graphs for categorical data.	• Data can be described as being categorical or quantitative. *Categorical data* is a set of data for which each piece of data fits into exactly one of several different groups or categories. *Quantitative data* is a set for which each piece of data can be placed on a numerical scale. • Categorical data can be displayed in tables, bar graphs, and percent bar graphs.	6.12D	2
End of Topic Assessment					1