



# **EduSmart Math Texas**

## **Course Description**

### **Grades 6–8**



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## Grade 6 Course Description

### TEKS 6.2 (A, B, C, D, E) Number and operations

#### Topic: Define and Diagram Sets of Rational Numbers

[TEKS 6.2 (A)] In this topic, students will learn to use Venn diagrams to show set relationships and describe sets of numbers.

#### Instruction Module: Define and Diagram Sets of Rational Numbers

In this Instruction Module, students will learn to define and diagram sets of rational numbers.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

#### Topic: Integers and Absolute Value

[TEKS 6.2 (B) (C)] In this topic, students will learn to define negative integers, find the absolute value, and compare and order integers.

#### Instruction Module: Negative Numbers

In this Instruction Module, students will learn to define negative numbers.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

#### Instruction Module: Opposite Numbers and Absolute Value

In this Instruction Module, students will learn to define opposite numbers and find the absolute value of numbers.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

#### Instruction Module: Comparing Integers

In this Instruction Module, students will learn to determine which integer has the greater value.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

#### Instruction Module: Ordering Integers

In this Instruction Module, students will learn to order integers from the least to the greatest.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

#### Topic: Concepts of Fractions

[TEKS 6.2 (E)] In this topic, students will learn to use models and visual representations to develop the concepts of fractions.

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| <p><b>Instruction Module: Fractions</b></p>                                  | <p>In this Instruction Module, students will learn how to use models and visual representations to develop the concepts of the following fractions: parts of unit wholes, parts of a collection, locations on number lines, locations on rulers (benchmark fractions), and division of whole numbers.</p> <p>The IM is supported by Student Notes, Teacher Notes and Independent Practice.</p> |
| <p><b>Topic: Convert, Compare, and Order Numbers</b></p>                     | <p>[TEKS 6.2 (C)] In this topic, students will learn to compare and order integers, fractions, decimals, and percents, and find their approximate location on a number line.</p>   |
| <p><b>Instruction Module: Ordering Fractions, Decimals, and Integers</b></p> | <p>In this Instruction Module, students will learn to order fractions, decimals and integers.</p> <p>The IM is supported by Student Notes, Teacher Notes and Independent Practice.</p>   |
| <p><b>Instruction Module: Comparing Fractions, Decimals and Percents</b></p> | <p>In this Instruction Module, students will learn to compare fractions, decimals and integers.</p> <p>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>  |
| <p><b>Topic: Order of Operations</b></p>                                     | <p>[TEKS 6.2 (A)] In this topic, students will learn to apply rules for order of operations to equations with rational numbers, with or without parentheses, brackets or exponents.</p>  |
| <p><b>Instruction Module: Order of Operations (PEMDAS)</b></p>               | <p>In this Instruction Module, students will understand and apply the order of operations to equations with whole numbers.</p> <p>The IM is supported by Student Notes, Teacher Notes and Independent Practice.</p>  |
| <p><b>Instruction Module: Order of Operations Involving Parentheses</b></p>  | <p>In this Instruction Module, students will apply rules for Order of Operations to equations with whole number and parentheses.</p> <p>The IM is supported by Student Notes, Teacher Notes and Independent Practice.</p>  |
| <p><b>Instruction Module: Grouping Symbols and Exponents</b></p>             | <p>In this Instruction Module, students will apply rules for Order of Operations to equations with whole numbers with or without parentheses, brackets, or exponents.</p> <p>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>  |

## Additional Resources

| <b>Math in the Real World Videos:</b> |   |
|---------------------------------------|---|
| <p><b>Music Amplifier</b></p>         | <p>This designer of music amplifiers explains that now that music has</p> |



**Designer** become digital, creating that special sound requires an understanding of rational numbers.

**Manipulative:**

**Number Line Manipulative**

This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.

**Quiz**

**6.2(A) Quiz**

This quiz assesses students' understanding and ability to classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers.

**6.2(B) Quiz**

This quiz assesses students' understanding and ability to identify a number, its opposite, and its absolute value.

**6.2(C) Quiz**

This quiz assesses students' understanding and ability to locate, compare, and order integers and rational numbers using a number line

**6.2(D) Quiz**

This quiz assesses students' understanding and ability to order a set of rational numbers arising from mathematical and real-world contexts.

**6.2(E) Quiz**

This quiz assesses students' understanding and ability to extend representations for division to include fraction notation such as  $a/b$  represents the same number as  $a \div b$  where  $b \neq 0$

## TEKS 6.3 (A, B, C, D, E) Number and operations

**Topic: Adding Integers**

[TEKS 6.3 (C) (D)] In this topic, students will learn to model addition of integers using counters and a number line, add integers, and find absolute value.

**Instruction Module: Adding Integers Using Counters**

In this Instruction Module, students will learn to add integers using counters.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

**Instruction Module: Adding Integers Using a Number Line**

In this Instruction Module, students will learn to add integers using a number line.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

**Instruction Module: Adding Integers Using Rules**

In this Instruction Module, students will learn to add integers using rules.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

**Topic: Subtracting Integers**

[TEKS 6.3 (C) (D)] In this topic, students will learn to model subtraction of integers using counters and a number line, and subtract integers.

**Instruction Module: Subtracting Integers Using Counters**

In this Instruction Module, students will learn to subtract integers using counters.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

**Instruction Module: Subtracting Integers Using a Number Line**

In this Instruction Module, students will learn to subtract integers using a number line.

The IM is supported by Student Notes, Teacher Notes and Independent Practice.

**Instruction Module: Subtracting Integers Using Rules**

In this Instruction Module, students will learn to subtract integers using rules.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Multiplying and Dividing Integers**

[TEKS 6.3 (C) (D)] In this topic, students will learn to model multiplication of integers using physical objects and pictures, and multiply and divide integers.

**Instruction Module:  
Multiplying Integers  
Using Counters**

In this Instruction Module, students will learn to multiply integers using counters.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Instruction Module:  
Multiplying Integers  
Using a Number  
Line**

In this Instruction Module, students will learn to multiply integers using a number line.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Multiplying and  
Dividing Integers  
Using Rules**

In this Instruction Module, students will learn to multiply and divide integers using rules.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Problem  
Solving with  
Integers**

[TEKS 6.3 (C) (D)] In this topic, students will learn to read, write, compare, and solve problems involving integers.

**Instruction Module:  
Draining a  
Swimming Pool**

In this Instruction Module, students will learn to use integer operations to compute the time needed to drain or fill a pool using the ideas of rate and time.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Elevation Changes**

In this Instruction Module, students will learn to use integer operations to compute changes of elevation using the ideas of rate and time.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Operations  
with Integers**

[TEKS 6.3 (C) (D)] In this topic, students will learn to add, subtract, multiply, and divide integers.

**Instruction Module:  
Adding and  
Subtracting Integers**

In this Instruction Module, students will learn to add and subtract Integers.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.



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| <b>Instruction Module:<br/>Multiplying and<br/>Dividing Integers</b>         | In this Instruction Module, students will learn to multiply and divide Integers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Multiplying<br/>Decimals</b>                                       | [TEKS 6.3 (E)] In this topic, students will learn to estimate products using rounding and compatible numbers, model multiplication of decimals, and develop and use algorithms to multiply decimals.                        |
| <b>Instruction Module:<br/>Modeling<br/>Multiplication of<br/>Decimals</b>   | In this Instruction Module, students will learn to model the multiplication of decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module:<br/>Multiplying<br/>Decimals by Powers<br/>of Ten</b> | In this Instruction Module, students will learn to multiply decimals by powers of ten.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module:<br/>Estimating Decimal<br/>Products</b>               | In this Instruction Module, students will learn to estimate decimal products using rounding and compatible numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                       |
| <b>Instruction Module:<br/>Multiplying<br/>Decimals: Standard<br/>Model</b>  | In this Instruction Module, students will learn to multiply decimals using the standard model.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Dividing<br/>Decimals</b>  | [TEKS 6.3 (E)] In this topic, students will learn to estimate quotients using rounding and compatible numbers, model division of decimals, and develop and use algorithms to divide decimals by whole numbers and decimals. |
| <b>Instruction Module:<br/>Estimating<br/>Quotients</b>                      | In this Instruction Module, students will learn to estimate quotients using front-end estimation, rounding and compatible numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.        |
| <b>Instruction Module:<br/>Dividing Decimals<br/>Using Models</b>            | In this Instruction Module, students will learn to divide decimals using models.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |

**Instruction Module:  
Dividing Decimals  
by Whole Numbers**

In this Instruction Module, students will learn to divide decimals by whole numbers.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Dividing Decimals  
by Decimals**

In this Instruction Module, students will learn to divide decimals by decimals.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Multiplying  
Fractions**

[TEKS 6.3 (B)(E)] In this topic, students will learn to model multiplication of fractions using diagrams and/or illustrations of manipulatives, and develop and use algorithms for multiplying fractions.

**Instruction Module:  
Multiplying  
Fractions-  
With/Without  
Models**

In this Instruction Module students will learn to multiply proper fractions with and without models.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Simplifying  
Fractions before  
Multiplying**

In this Instruction Module students will learn to simplify fractions by dividing out the common factors before multiplying.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Multiply with Mixed  
Numbers**

In this Instruction Module students will learn to multiply fractions that are mixed numbers.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Dividing  
Fractions**

[TEKS 6.3 (A)(E)] In this topic, students will learn to model division of fractions using diagrams and illustrations of manipulatives, and develop and use algorithms for dividing fractions.

**Instruction Module:  
Inverting and  
Multiplying**

In this Instruction Module, students will learn to divide fractions using models and the invert-and-multiply algorithm.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Using a Common  
Denominator**

In this Instruction Module, students will learn to divide fractions using models and the common denominator algorithm.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

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| <b>Topic: Properties of Operations - Fractions and Decimals</b> | [TEKS 6.3 (E)] In this topic, students will learn to add, subtract, multiply, and divide fractions and decimals. |
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| <b>Instruction Module: Applying Properties Of Operations- Fractions</b> | In this Instruction module, students will learn to add, subtract, multiply and divide fractions.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
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|---|---|
| <b>Instruction Module: Applying Properties of Operations - Decimals</b> | In this Instruction module, students will learn to add, subtract, multiply and divide decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
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## Additional Resources

### Math in the Real World Videos:

|                    |  |
|--------------------|--|
| <b>Stunt Pilot</b> | A stunt pilot shows the importance of understanding the number line in flying an airplane and performing stunts. The gauges on an airplane function very much like number lines. The pilot must use data from the instruments and perform operations with positive and negative integers to perform daring stunts. |
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| <b>Jazz Musician</b> | A jazz musician explains that all musical notation is based on the mathematical concept of fractions. In order to understand note values, a musician must understand fractions. Multiplying and dividing fractions are skills a jazz musician must have. |
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| <b>Costume Designer</b> | In this video, a costume designer explains that budgeting and tracking expenses are major parts of her job. In order to be successful in managing her design projects, she must be able to perform operations with decimals. |
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### Interactivities

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| <b>Airplane Gauges</b> | In this interactivity students, will apply their understanding of operations with integers. Students will use integer addition, subtraction, multiplication, and division to find changes in altitude and rates of ascent or descent of an airplane. |
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| <b>Math, Music, Money, and Measuring</b> | In this interactivity, students will apply their understanding of division of fractions by fractions to solve word problems. |
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|  | <b>Manipulatives</b>  |
|--|---|
| <b>Number Line Manipulatives</b>           | This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.               |
| <b>Color Counters Manipulatives</b>        | This manipulative includes two-colored counters to represent positive and negative integers. Students can drag integers, operators, and counters to model addition, subtraction, multiplication, and division of integers.  |
| <b>Fraction-Strips Manipulatives</b>       | This manipulative includes fraction strips that represent one whole, $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{1}{6}$ , $\frac{1}{8}$ , $\frac{1}{10}$ , and $\frac{1}{12}$ , which the students can use to compare, order, and find equivalent fractions. |
| <b>Place Value Manipulatives</b>           | This manipulative includes place value charts for whole numbers and decimals. Students can use the charts to compare, order, add, subtract, multiply, or divide whole numbers or decimals.  |
|  | <b>Problem Solving</b>  |
| <b>Problem Solving - Integers</b>          | This item guides students through the processes of solving real-world and mathematical problems. Students will add and multiply positive and negative integers to solve a problem.  |
|  | <b>Activities</b>   |
| <b>Fly The Plane</b>                       | Students will practice adding, subtracting, and performing mixed operations with integers under the context of airplane altitude and vertical airspeed.   |
| <b>Costume Designer</b>                    | Students will practice multiplying and dividing positive rational numbers under the context of materials costs for costume design.  |
| <b>Math, Music, Money, and Measurement</b> | Students will practice dividing fractions under the context of musical notes and time signatures, money, and measurement quantities.  |
|  | <b>Quiz</b>   |
| <b>6.3(A) Quiz</b>                         | This quiz assesses students' understanding and ability to recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values.   |



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| <b>6.3(B) Quiz</b> | This quiz assesses students' understanding and ability to determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one. |
| <b>6.3(C) Quiz</b> | This quiz assesses students' understanding and ability to represent integer operations with concrete models and connect the actions with the models to standardized algorithms.  |
| <b>6.3(D) Quiz</b> | This quiz assesses students' understanding and ability to add, subtract, multiply, and divide integers fluently.   |
| <b>6.3(E) Quiz</b> | This quiz assesses students' understanding and ability to multiply and divide positive rational numbers fluently.  |

## TEKS 6.4 (A, B, C, D, E, F, G, H) Proportionality

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|---|--|
| <b>Topic: Concepts of Fractions, Ratios, and Percents</b> | [TEKS 6.4 (E)] In this topic, students will learn to use models and visual representations to develop the concepts of fractions, ratios, and percents.   |
| <b>Instruction Module: Fractions</b>                      | In this Instruction Module, students will learn how to use models and visual representations to develop the concepts of the following fractions: parts of unit wholes, parts of a collection, locations on number lines, locations on rulers (benchmark fractions), and division of whole numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Ratios: Part to Whole</b>          | In this Instruction Module, students will learn to use models and visual representations to develop the concepts of ratios: part-to-part (two boys to three girls).<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Ratios: Part to Part</b>           | In this Instruction Module, students will learn to use models and visual representations to develop the concepts of ratios: part-to-whole (two boys to five people).<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |

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| <b>Instruction Module:<br/>Percent</b>                                      | <p>In this Instruction Module, students will learn to make conversions within metric measurement system in real-world problems (e.g. meters to centimeters, liters to milliliters, etc.).</p> <p>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p> |
| <b>Topic: Decimal, Fraction, and Percent Equivalents</b>                    | <p>[TEKS 6.4 (E) (F) (G)] In this topic, students will develop an understanding of decimal place value, identify decimal and percent equivalents for benchmark fractions, and convert between fractions, decimals, and percents.</p>  |
| <b>Instruction Module:<br/>Decimal Place Value and Fraction Equivalents</b> | <p>In this Instruction Module, students will learn to use models to understand decimal place value and fraction equivalents.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <b>Instruction Module:<br/>Converting between Fractions and Decimals</b>    | <p>In this Instruction Module, students will learn to change decimals to fractions and fractions to decimals.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Instruction Module:<br/>Changing a Fraction to a Percent</b>             | <p>In this Instruction Module, students will learn to find the percent equivalent of fractions.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Instruction Module:<br/>Benchmark Fractions and Their Equivalents</b>    | <p>In this Instruction Module, students will learn to find the decimal and percent equivalents of benchmark fractions.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <b>Topic: Ratios, Rates, and Proportional Reasoning</b>                     | <p>[TEKS 6.4 (B) (D)] In this topic, students will learn to write ratios as fractions in simplest form, determine unit rates, and use proportional reasoning and ratios to represent problem situations.</p>  |
| <b>Instruction Module:<br/>Ratios, Rates, and Unit Rates</b>                | <p>In this Instruction Module, students will explore unit rates and unit costs.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Instruction Module:<br/>Problem Solving with Ratios and Proportions</b>  | <p>In this Instruction Module, students will learn to use ratios and proportions to solve problems.</p> <p>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>   |
| <b>Instruction Module:<br/>Comparing Rates</b>                              | <p>In this Instruction Module, students will learn to compare rates using a table.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |

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| <b>Topic: Same System Conversions</b>                            | [TEKS 6.4 (H)] In this topic, students will learn to make conversions within the same measurement system, either customary or metric, and make conversions using time in real-world problems.   |
| <b>Instruction Module: Converting Customary Units</b>            | In this Instruction Module, students will learn to make conversions within the customary measurement system in real-world problems (feet to inches, quarts to gallons, etc.).<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.   |
| <b>Instruction Module: Converting Metric Units</b>               | In this Instruction Module, students will learn to make conversions within metric measurement system in real-world problems (e.g. meters to centimeters, liters to milliliters, etc.).<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.  |
| <b>Instruction Module: Converting Time Units</b>                 | In this Instruction Module, students will learn to make conversions using time in real-world problems (e.g. hours, to minutes to seconds).<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Additive and Multiplicative Relationships</b>          | [TEKS 6.4 (A)] In this topic students will compare and contrast the symbolic, tabular, graphical, and verbal forms of relationships that are additive and those that are multiplicative.  |
| <b>Lesson (Print): Additive and Multiplicative Relationships</b> | In this lesson, students will learn to compare and contrast the symbolic, tabular, graphical, and verbal forms of relationships that are additive and those that are multiplicative, and determine methods to differentiate between them.<br>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
| <b>Topic: Ratios as Multiplicative Comparisons</b>               | [TEKS 6.4 (C)] In this topic, students will learn to recognize and give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.   |
| <b>Lesson (Print): Ratios as Multiplicative Comparisons</b>      | In this lesson, students will learn to examine how a ratio is constructed and construct ratios that show a multiplicative comparison of like attributes within a contextual situation.<br>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.  |
| <b>Topic: Connecting Forms</b>                                   | [TEKS 6.4 (E) (F)] In this topic, students will learn to connect the different ways to represent fractions, decimals, ratios, and percent numbers.  |

**Lesson (Print):  
Connecting Forms**

In this lesson students will learn to connect the different ways to represent fractions, decimals, ratios, and percent numbers. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Chocolatier**

The owner of a small artisan chocolate business discusses the importance of ratios and proportions for creating delicious chocolate treats.

**Retail Store Manager**

This retail store manager talks about the importance of math in running her store. Percentages are used to compute mark-ups, discounts, and sales tax.

**Triathlete**

This triathlete talks about how important it is to understand rates, unit rates, and conversion of measurement units in training for a triathlon.

**Performance Car Designer**

Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance.

### Interactivities

**Gas Station Interactivity**

In this interactivity, students will apply their understanding of proportional relationships. They will recognize the proportional relationship between the values on a gas pump display (the unit rate, the quantity of gas purchased, and the total cost) to find one of the values when the other two are known.

**Triathlon Interactivity**

In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units.

**Performance Cars Variables**

In this interactivity, students will use equations, tables, and graphs to represent and analyze the relationships between independent and dependent variables; the situations include motion at a constant speed and the relationship between distance and time, and the relationship between engine speed and vehicle speed at four different forward gears of an automobile.

### Manipulatives



**Number Line Manipulatives**

This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.

**Fraction-Strips Manipulatives**

This manipulative includes fraction strips that represent one whole,  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ ,  $\frac{1}{8}$ ,  $\frac{1}{10}$ , and  $\frac{1}{12}$ , which the students can use to compare, order, and find equivalent fractions.

**Problem Solving**

**Comparing Ratios**

This item guides students through the processes of solving real-world and mathematical problems. Students will analyze and use proportional relationships, and compare their graphs to solve a problem.

**Activities**

**Gas Station**

In this activity, students will practice solving problems with proportional relationships under the context of gasoline purchases.

**Triathlon**

In this activity, students will practice identifying proportional relationships and calculating rates of change in the context of triathlon events.

**Quiz**

**6.4(A) Quiz**

This quiz assesses students' understanding and ability to compare two rules verbally, numerically, graphically, and symbolically in the form of  $y = ax$  or  $y = x + a$  in order to differentiate between additive and multiplicative relationships

**6.4(B) Quiz**

This quiz assesses students' understanding and ability to apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates.

**6.4(C) Quiz**

This quiz assesses students' understanding and ability to give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.

**6.4(D) Quiz**

This quiz assesses students' understanding and ability to give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients

**6.4(E) Quiz**

This quiz assesses students' understanding and ability to represent ratios and percents with concrete models, fractions, and decimals.

|                    |   |
|--------------------|---|
| <b>6.4(F) Quiz</b> | This quiz assesses students' understanding and ability to represent benchmark fractions and percents such as 1%, 10%, 25%, 33 1/3%, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers |
| <b>6.4(G) Quiz</b> | This quiz assesses students' understanding and ability to generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money.  |
| <b>6.4(H) Quiz</b> | This quiz assesses students' understanding and ability to convert units within a measurement system, including the use of proportions and unit rates.   |

### TEKS 6.5 (A, B, C) Proportionality

|  |   |
|--|---|
| <b>Topic: Finding Percents</b>                                   | [TEKS 6.5 (C)] In this topic, students will learn to relate with or without models and pictures, concepts of ratios, proportion, and percent and demonstrate conceptual understanding to find a specific percent of a number. |
| <b>Instruction Module: Percent and Ratio</b>                     | In this Instruction Module, students will learn to change a ratio to a percentage.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Finding the Percent of a Number</b>       | In this Instruction Module, students will learn to find the percent of a number.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Proportions</b>                           | In this Instruction Module, students will learn to determine if two ratios form a proportion.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Decimal and Percent Equivalents</b>                    | [TEKS 6.5 (C)] In this topic, students will learn to convert proper fractions to decimals and percents, and convert mixed numbers and improper fractions to decimals and percents.  |
| <b>Instruction Module: Fractions to Decimals and Percentages</b> | In this Instruction Module, students will learn to convert proper fractions to decimals and percentages.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                    |

|   |  |
|---|--|
| <p><b>Instruction Module:<br/>Rational Numbers<br/>to Repeating<br/>Decimals</b></p>      | <p>In this Instruction Module, students will learn to find the decimal and percent equivalents of rational numbers that can be written as repeating decimals.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <p><b>Instruction Module:<br/>Decimal and<br/>Percent Equivalent<br/>of Fractions</b></p> | <p>In this Instruction Module, students will learn to find the decimal and percent equivalents of mixed fractions.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Topic: Ratios, Rates,<br/>and Proportional<br/>Reasoning</b></p>                    | <p>[TEKS 6.5 (A) In this topic, students will learn to write ratios as fractions in simplest form, determine unit rates, and use proportional reasoning and ratios to represent problem situations.</p>  |
| <p><b>Instruction Module:<br/>Ratios, Rates, and<br/>Unit Rates</b></p>                   | <p>In this Instruction Module, students will explore unit rates and unit costs.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Problem Solving<br/>with Ratios and<br/>Proportions</b></p> | <p>In this Instruction Module, students will learn to use ratios and proportions to solve problems.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>                                   |
| <p><b>Instruction Module:<br/>Comparing Rates</b></p>                                     | <p>In this Instruction Module, students will learn to compare rates using a table.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Topic: Percent<br/>Proportions</b></p>  | <p>[TEKS 6.5 (B) In this topic, students will learn to use the percent proportion to write fractions as percents, estimate a percent of a number, and solve problems in real-world situations using percentages.</p>                                 |
| <p><b>Instruction Module:<br/>Writing Fractions as<br/>Percentages</b></p>                | <p>In this Instruction Module, students will learn to write fractions as percents.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Instruction Module:<br/>Estimating the<br/>Percent of a<br/>Number</b></p>          | <p>In this Instruction Module, students will learn to estimate a percent of a number.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Solving Problems<br/>with Percentages</b></p>               | <p>In this Instruction Module, students will learn to solve problems with percentages.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>  |

**Topic: Using Percent Equations**

[TEKS 6.5 (B) In this topic, students will learn to find the percent of a given number, find what percent one number is of another number, and find a number when a percent of it is given.

**Instruction Module: Finding the Percent of a Number**

In this Instruction Module, students will learn to find the percent of a number.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Find Percent Number of Another Number**

In this Instruction Module, students will learn to find what percent one number is of another number.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Finding a Number When a Percent is Given**

In this Instruction Module, students will learn to find a number when a percent is given.  
The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Similar Polygons**

[TEKS 6.5 (A) In this topic, students will learn to identify similar figures, explore and develop the properties of similar figures (ratio of sides and congruent angles), and apply proportional reasoning to solve problems involving congruent or similar shapes.

**Instruction Module: Enlargements and Reductions**

In this Instruction Module, students will learn of the different properties of similar figures, including the ideas of ratio of sides and congruent angles.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Scale Drawings**

In this Instruction Module, students will learn to create scale drawings.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

## Additional Resources

### Math in the Real-world Videos

**Stockbroker**

This financial executive uses ratios to make decisions about buying and selling stocks.

**Triathlete**

This triathlete talks about how important it is to understand rates, unit rates, and conversion of measurement units in training for a triathlon.

**Performance Car Designer**

Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance.

|                                      | <b>Interactivities</b>   |
|--------------------------------------|--|
| <b>Gas Station Interactivity</b>     | In this interactivity, students will apply their understanding of proportional relationships. They will recognize the proportional relationship between the values on a gas pump display (the unit rate, the quantity of gas purchased, and the total cost) to find one of the values when the other two are known.  |
| <b>Triathlon Interactivity</b>       | In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units.   |
| <b>Performance Cars Variables</b>    | In this interactivity, students will use equations, tables, and graphs to represent and analyze the relationships between independent and dependent variables; the situations include motion at a constant speed and the relationship between distance and time, and the relationship between engine speed and vehicle speed at four different forward gears of an automobile. |
|                                      | <b>Manipulatives</b>   |
| <b>Number Line Manipulatives</b>     | This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.  |
| <b>Fraction-Strips Manipulatives</b> | This manipulative includes fraction strips that represent one whole, $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{1}{6}$ , $\frac{1}{8}$ , $\frac{1}{10}$ , and $\frac{1}{12}$ , which the students can use to compare, order, and find equivalent fractions.  |
|                                      | <b>Activities</b>  |
| <b>Gas Station</b>                   | In this activity students will practice solving problems with proportional relationships under the context of gasoline purchases.  |
| <b>Triathlon</b>                     | In this activity students will practice identifying proportional relationships and calculating rates of change in the context of triathlon events.   |
|                                      | <b>Quiz</b>  |
| <b>6.5(A) Quiz</b>                   | This quiz assesses students' understanding and ability to represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions.  |



|                           |  |
|---------------------------|--|
| <p><b>6.5(B) Quiz</b></p> | <p>This quiz assesses students' understanding and ability to solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models.</p> |
| <p><b>6.5(C) Quiz</b></p> | <p>This quiz assesses students' understanding and ability to use equivalent fractions, decimals, and percents to show equal parts of the same whole.</p>   |

| <p><b>TEKS 6.6 (A, B, C) Expressions, equations, and relationships</b></p>    |   |
|---|---|
| <p><b>Topic: Writing Algebraic Expressions</b></p>                            | <p>[TEKS 6.6 (C)] In this topic, students will learn to translate word phrases into algebraic expressions.</p>  |
| <p><b>Instruction Module: Writing Algebraic Expressions</b></p>               | <p>In this Instruction Module, students will learn to write word phrases as algebraic expressions. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                       |
| <p><b>Topic: Translating Sentences into Algebraic Equations</b></p>           | <p>[TEKS 6.6 (C)] In this topic, students will learn to translate sentences into algebraic equations and write equations to represent real-world situations.</p>  |
| <p><b>Instruction Module: Writing Sentences as Algebraic Equations</b></p>    | <p>In this Instruction Module, students will learn to write sentences as algebraic equations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                            |
| <p><b>Instruction Module: Writing Equations for Real-World Situations</b></p> | <p>In this Instruction Module, students will learn to write algebraic equations to represent real-world situations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>      |
| <p><b>Topic: Independent and Dependent Quantities</b></p>                     | <p>[TEKS 6.6 (A) (B) (C)] In this topic, students will learn to identify independent and dependent quantities from tables and graphs and write equations that represents the relationship between them.</p> |

|  |   |
|--|---|
| <p><b>Lesson (Print):<br/>Independent and<br/>Dependent<br/>Quantities</b></p> | <p>In this lesson, students learn to identify independent and dependent quantities from tables and graphs and write equations that represents the relationship between independent and dependent quantities from a table.</p> <p>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>   |
| <p><b>Additional Resources</b></p>   |   |
| <p><b>Math in the Real-world Videos</b></p>                                    |   |
| <p><b>Performance Car Designer</b></p>   | <p>Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance.</p>  |
| <p><b>Triathlete</b></p>   | <p>This triathlete talks about how important it is to understand rates, unit rates, and conversion of measurement units in training for a triathlon.</p>  |
| <p><b>Interactivities</b></p>  |   |
| <p><b>Triathlon Interactivity</b></p>  | <p>In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units.</p>   |
| <p><b>Gas Station Interactivity</b></p>  | <p>In this interactivity, students will apply their understanding of proportional relationships. They will recognize the proportional relationship between the values on a gas pump display (the unit rate, the quantity of gas purchased, and the total cost) to find one of the values when the other two are known.</p>  |
| <p><b>Performance Cars Variables</b></p>                                       | <p>In this interactivity, students will use equations, tables, and graphs to represent and analyze the relationships between independent and dependent variables; the situations include motion at a constant speed and the relationship between distance and time, and the relationship between engine speed and vehicle speed at four different forward gears of an automobile.</p> |
| <p><b>Activities</b></p>   |   |
| <p><b>Gas Station Triathlon</b></p>  | <p>In this activity, students will practice solving problems with proportional relationships under the context of gasoline purchases.</p>   |

|                    |  |
|--------------------|--|
| <b>Triathlon</b>   | In this activity, students will practice identifying proportional relationships and calculating rates of change in the context of triathlon events.                                  |
|                    | <b>Quiz</b>  |
| <b>6.6(A) Quiz</b> | This quiz assesses students' understanding and ability to identify independent and dependent quantities from tables and graphs.  |
| <b>6.6(B) Quiz</b> | This quiz assesses students' understanding and ability to write an equation that represents the relationship between independent and dependent quantities from a table.              |
| <b>6.6(C) Quiz</b> | This quiz assesses students' understanding and ability to represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$ . |

## TEKS 6.7 (A, B, C, D) Expressions, equations, and relationships

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|--|--|
| <b>Topic: Order of Operations</b>                                    | [TEKS 6.7 (A)] In this topic, students will learn to apply rules for order of operations to equations with rational numbers, with or without parentheses, brackets or exponents.   |
| <b>Instruction Module: Order of Operations (PEMDAS)</b>              | In this Instruction Module, students will understand and apply the order of operations to equations with whole numbers. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Order of Operations Involving Parentheses</b> | In this Instruction Module, students will learn to apply rules for Order of Operations to equations with whole number and parentheses. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Grouping Symbols and Exponents</b>            | In this Instruction Module, students will learn to apply rules for Order of Operations to equations with whole numbers with or without parentheses, brackets, or exponents. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
| <b>Topic: Applying the Order of Operations</b>                       | [TEKS 6.7 (A)] In this topic, students will learn to apply the order of operations to solve expressions with and without grouping symbols.   |



**Instruction Module:  
Order of Operations  
–No Grouping  
Symbols**

In this Instruction Module, students will learn to apply the order of operations where there are no grouping symbols. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Order of Operations  
with Grouping  
Symbols**

In this Instruction Module, students will learn to apply the order of operations where grouping symbols are present or where they are implied. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Properties of  
Addition and  
Multiplication and  
Inverse Operations**

[TEKS 6.7 (D)] In this topic, students will learn to identify and apply properties of addition and multiplication: commutative, associative, identity, and multiplicative property of zero.

**Instruction Module:  
Properties of  
Addition**

In this Instruction Module, students will learn to identify properties of addition: commutative, associative, identity, and multiplicative property of zero. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Using Properties of  
Addition**

In this Instruction Module, students will learn to apply the properties of addition to simplify computations with whole numbers and to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Properties of  
Multiplication**

In this Instruction Module, students will learn to identify properties of multiplication: commutative, associative, identity, and multiplicative property of zero. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Using Properties of  
Multiplication**

In this Instruction Module, students will learn to apply the properties of multiplication to simplify computations with whole numbers and to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Distributive  
Properties**

[TEKS 6.7 (D)] In this topic, students will learn to identify the distributive property by using models, and apply it to simplify computations with whole numbers.

**Instruction Module:  
One Digit Number  
Times One Digit  
Number**

In this Instruction Module, students will learn to solve for products using the distributive property model for one-digit number times a one-digit number. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

|   |  |
|---|--|
| <p><b>Instruction Module:<br/>One Digit Number<br/>Times Two Digit<br/>Number</b></p>     | <p>In this Instruction Module, students will learn to solve products using the distributive property model for one-digit number times a two-digit number.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <p><b>Instruction Module:<br/>Two Digit Number<br/>Times Two Digit<br/>Number</b></p>     | <p>In this Instruction Module, students will learn to solve products using the distributive property model for two-digit number times a two-digit number.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <p><b>Instruction Module:<br/>Multiplication over<br/>Subtraction</b></p>                 | <p>In this Instruction Module, students will learn to solve for products using the distributive property model for multiplication over subtraction.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>       |
| <p><b>Instruction Module:<br/>Applications of the<br/>Distributive<br/>Property</b></p>   | <p>In this Instruction Module, students will learn to use the distributive property to solve problems.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Topic: Factors and<br/>Prime Factorization</b></p>                                  | <p>[TEKS 6.7 (A)] In this topic, students will learn to find the factors of a number, the prime factorization of a composite number, and the common factors including the greatest common factor (GCF).</p>                                      |
| <p><b>Instruction Module:<br/>Finding the Factors<br/>of a Number</b></p>                 | <p>In this Instruction Module, students will learn to find the factors of a number.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Finding the Prime<br/>Factorization of a<br/>Number</b></p> | <p>In this Instruction Module, students will learn to find the prime factorization of a number.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Common Factors<br/>and GCF</b></p>                          | <p>In this Instruction Module, students will learn to find the common factors and the greatest common factors of two or more integers.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                    |
| <p><b>Instruction Module:<br/>Using Prime<br/>Factorization to Find<br/>the GCF</b></p>   | <p>In this Instruction Module, students will learn to use prime factorization to find the GCF.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Topic: Writing<br/>Algebraic<br/>Expressions</b></p>                                | <p>[TEKS 6.7 (B)] In this topic, students will learn to translate word phrases into algebraic expressions.</p>   |

|   |   |
|---|---|
| <p><b>Instruction Module:<br/>Writing Algebraic Expressions</b></p>               | <p>In this Instruction Module, students will learn to write word phrases as algebraic expressions.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Topic: Identifying Algebraic Properties</b></p>                             | <p>[TEKS 6.7 (D)] In this topic, students will learn to recognize and use the Commutative and Associative Properties of Addition and Multiplication, the Identity and Inverse Properties of Addition and Multiplication, and the Distributive Property of Multiplication over Addition.</p> |
| <p><b>Instruction Module:<br/>Commutative and Associative Properties</b></p>      | <p>In this Instruction Module, students will learn to recognize and use the Commutative and Associative Properties of addition and multiplication.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Identity Elements and Inverse Properties</b></p>    | <p>In this Instruction Module, students will learn to recognize the Identity elements and inverses for addition and multiplication and use their respective properties.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                              |
| <p><b>Instruction Module:<br/>Distributive Property</b></p>                       | <p>Recognize and use the Distributive Property of Multiplication over Addition<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Model Properties with Algebra Tiles</b></p>         | <p>In this Instruction Module, students will learn to model properties with algebra tiles.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Topic: Translating Sentences into Algebraic Equations</b></p>               | <p>[TEKS 6.7 (B)] In this topic, students will learn to translate sentences into algebraic equations and write equations to represent real-world situations.</p>  |
| <p><b>Instruction Module:<br/>Writing Sentences as Algebraic Equations</b></p>    | <p>In this Instruction Module, students will learn to writes sentences as algebraic equations.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Writing Equations for Real-World Situations</b></p> | <p>In this Instruction Module, students will learn to write algebraic equations to represent real-world situations.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |

**Topic: Expressions and Equations**

[TEKS 6.7 (B) (C) (D)] In this topic, students will learn to distinguish between expressions and equations, determine if two expressions are equivalent, and generate equivalent expressions using the inverse properties.

**Lesson (Print): Expressions and Equations**

In this lesson, students will learn to distinguish between expressions and equations, determine if two expressions are equivalent, and generate equivalent expressions using the inverse properties.

The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Chocolatier**

The owner of a small artisan chocolate business discusses the importance of ratios and proportions for creating delicious chocolate treats.

**Zookeeper**

A zookeeper enjoys a great job dealing with animals all day. Math skills are vital for ordering the proper quantity of food based on animal weight, growth rates, and the number of feedings per year.

### Interactivities

**Chocolatier – Using LCM and GCF**

In this interactivity, students will apply their understanding of the least common multiple (LCM) and the greatest common factor (GCF) of two numbers to solve problems that a chocolatier might come across while packaging chocolates.

### Manipulatives

**Algebra Tiles Manipulatives**

This manipulative includes tiles that represent  $+1$  and  $-1$ ,  $+x$  and  $-x$ , and  $+x^2$  and  $-x^2$  that students can drag to a workspace to model multiplication of monomials and polynomials.

### Activities

**Chocolatier**

In this activity students will practice determining the least common multiple or greatest common factor of whole numbers to solve problems under the context of preparing boxes of chocolates.

### Quiz

**6.7(A) Quiz**

This quiz assesses students' understanding and ability to generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization.

**6.7(B) Quiz**

This quiz assesses students' understanding and ability to distinguish between expressions and equations verbally, numerically, and algebraically.

## 6.7(C) Quiz

This quiz assesses students' understanding and ability to determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.

## 6.7(D) Quiz

This quiz assesses students' understanding and ability to generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.

## TEKS 6.8 (A, B, C, D) Expressions, equations, and relationships

### Topic: Triangles

[TEKS 6.8 (A)] In this topic, students will learn to identify, describe, draw, and classify triangles, and determine the sum of the measures of interior angles of triangles.

### Instruction Module: Defining Triangles

In this Instruction Module, students will learn to define and name triangles.  
The IM is supported by Student Notes and Teacher Notes.

### Instruction Module: Classifying Triangles

In this Instruction Module, students will learn to classify and sketch triangles.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Instruction Module: Triangle Sum Property

In this Instruction Module, student will learn to define and use the triangle sum property.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Area

[TEKS 6.8 (B) (C) (D)] In this topic, students will learn to apply formulas to find the area of triangles, different types of quadrilaterals, and circles, and solve real-world problems.

### Instruction Module: Area of Rectangles and Parallelograms

In this Instruction Module, students will learn to solve real-world and mathematical problems involving the area of rectangles and parallelograms.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Instruction Module: Area of Triangles and Trapezoids

In this Instruction Module, students will learn to solve real-world and mathematical problems involving the area of triangle and trapezoids.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Instruction Module:  
Find Different Areas  
for a Given  
Perimeter**

In this Instruction Module, students will learn to solve real-world and mathematical problems that use the idea of different areas for a given perimeter.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Volume of Prisms**

[TEKS 6.8 (C) (D)] In this topic, students will learn to apply formulas to solve problems involving the volume of rectangular prisms.

**Instruction Module:  
Volume of a  
Rectangular Prism**

In this Instruction Module, students will learn to solve problems involving the volume of rectangular prisms.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

## Additional Resources

### Math in the Real-world Videos

**Architect**

This architect discusses the role of math in his profession. He specifically discusses how an understanding of triangles was essential in the design of the Griffith Observatory.

**Baseball Stadium  
Groundskeeper**

The Groundskeeper for Dodger Stadium shows that geometry skills are important to his job. Before he can determine how much fertilizer is needed or how much topsoil to purchase, he must use his geometry skills. These include determining area by decomposing an irregular shape into triangles and rectangles, and computing the volume of a right rectangular prism to determine the topsoil needed to redo the infield.

### Activities

**Baseball Stadium  
Groundskeeper**

In this activity, students will practice solving problems involving the angles of a triangle, the area of triangles, rectangles, parallelograms, and trapezoids, and the volume of rectangular prisms under the context of a baseball field.

### Quiz

**6.8(A) Quiz**

This quiz assesses students' understanding and ability to extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle.

**6.8(B) Quiz**

This quiz assesses students' understanding and ability to model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes.

## 6.8(C) Quiz

This quiz assesses students' understanding and ability to write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.

## 6.8(D) Quiz

This quiz assesses students' understanding and ability to determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.

## TEKS 6.9 (A, B, C) Expressions, equations, and relationships

### Topic: Solving Equations by Inspection

[TEKS 6.9 (B)] In this topic, students will learn to solve one-step equations by Inspection, using addition, subtraction, multiplication, and division.

### Instruction Module: Solving Equations by Inspection-Part I

In this Instruction Module, students will learn to solve one-step equations using addition and subtraction by inspection. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Solve Equations by Inspection-Part II

In this Instruction Module, students will learn to solve one-step equations using multiplication and division by inspection. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Solving One-Step Linear Equations

[TEKS 6.9 (B)] In this topic, students will learn to solve one-step linear equations by using addition, subtraction, multiplication and division, and model it using algebra tiles.

### Instruction Module: Solving One-Step Equations-Part I

In this Instruction Module, students will learn to solve one-step linear equations by multiplication and division. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Solving One-Step Equations-Part II

In this Instruction Module, students will learn to solve one-step linear equations by addition and subtraction. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

|  |   |
|--|---|
| <b>Instruction Module:<br/>Solving One-Step<br/>Equations-Algebra<br/>Tiles</b>    | In this Instruction Module, students will learn to solve one-step linear equations with algebra tiles.<br>The IM is supported by Student Notes and Teacher Notes.   |
| <b>Topic: Translating<br/>Sentences into<br/>Algebraic Equations</b>               | [TEKS 6.9 (A)] In this topic, students will learn to translate sentences into algebraic equations and write equations to represent real-world situations.   |
| <b>Instruction Module:<br/>Writing Sentences<br/>as Algebraic<br/>Equations</b>    | In this Instruction Module, students will learn to writes sentences as algebraic equations.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Writing Equations<br/>for Real-World<br/>Situations</b> | In this Instruction Module, students will learn to write algebraic equations to represent real-world situations.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Write<br/>Equations to Solve<br/>Geometry Problems</b>                   | [TEKS 6.9 (A) (B)] In this topic, students will learn to solve perimeter and angle problems using equations of one variable.  |
| <b>Instruction Module:<br/>Perimeter Problems</b>                                  | In this Instruction Module, students will learn to solve perimeter problems using equations of one variable.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module:<br/>Angle Problems</b>                                      | In this Instruction Module, students will learn to solve angle problems using equations of one variable.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Solving Linear<br/>Inequalities by<br/>Inspection</b>                    | [TEKS 6.9 (B)] In this topic, students will learn to solve linear inequalities by inspection.   |
| <b>Instruction Module:<br/>Solving Linear<br/>Inequalities by<br/>Inspection</b>   | In this Instruction Module, students will learn to solve linear inequalities by inspection, write the solution in proper notation, graph the solution on a number line, and check the solution.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Topic: Solving One-<br/>Step Linear<br/>Inequalities</b>                        | [TEKS 6.9 (B) (C)] In this topic, students will learn to solve one-step linear inequalities using addition, subtraction, multiplication, and division.  |



**Instruction Module: One-Step Linear Inequalities-Add/Subtract** In this Instruction Module, students will learn to solve one-step linear inequalities using addition and subtraction. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: One-Step Linear Inequalities-Multiply/Divide** In this Instruction Module, students will learn to solve one-step linear inequalities using multiplication and division. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Problems Using Inequalities of One Variable** [TEKS 6.9 (A)] In this topic, students will learn to solve problems using inequalities of one variable.

**Instruction Module: Solving Problems with Inequalities** In this Instruction Module, students will learn to write and solve inequalities of one variable so as to solve problems.

## Additional Resources

### Math in the Real-world Videos

**Rose Bowl Float** To build a beautiful float for the Rose Bowl Parade requires the extensive use of equations and inequalities. This designer must work within constraints of height, width, and weight

**Firefighter** A firefighter needs math to determine what is needed to put out a fire. Evaluating expressions that arise from formulas is a vital part of the job. Two formulas a firefighter uses are the friction loss formula and the formula for the volume of right rectangular prism.

### Activities

**Parade Float Design** In this activity, students will practice writing and solving one-variable equations and inequalities under the context of designing a parade float.

### Quiz

**6.9(A) Quiz** This quiz assesses students' understanding and ability to write one-variable, one-step equations and inequalities to represent constraints or conditions within problems

**6.9(B) Quiz** This quiz assesses students' understanding and ability to represent solutions for one-variable, one-step equations and inequalities on number lines

**6.9(C) Quiz** This quiz assesses students' understanding and ability to write corresponding real-world problems given one-variable, one-step equations or inequalities

## TEKS 6.10 (A, B) Expressions, equations, and relationships

### Topic: Write Equations to Solve Geometry Problems

[TEKS 6.10 (A)] In this topic, students will learn to solve perimeter and angle problems using equations of one variable.

### Instruction Module: Perimeter Problems

In this Instruction Module, students will learn to solve perimeter problems using equations of one variable.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Angle Problems

In this Instruction Module, students will learn to solve angle problems using equations of one variable.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: Solving Linear Inequalities by Inspection

[TEKS 6.10 (B)] In this topic, students will learn to solve linear inequalities by inspection.

### Instruction Module: Solving Linear Inequalities by Inspection

In this Instruction Module, students will learn to solve linear inequalities by inspection, write the solution in proper notation, graph the solution on a number line, and check the solution.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Solving One-Step Linear Inequalities

[TEKS 6.10 (A)] In this topic, students will learn to solve one-step linear inequalities using addition, subtraction, multiplication, and division.

### Instruction Module: One-Step Linear Inequalities-Add/Subtract

In this Instruction Module, students will learn to solve one-step linear inequalities using addition and subtraction.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Instruction Module: One-Step Linear Inequalities-Multiply/Divide

In this Instruction Module, students will learn to solve one-step linear inequalities using multiplication and division.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Problems Using Inequalities of One Variable

[TEKS 6.10 (A)] In this topic, students will learn to solve problems using inequalities of one variable.

**Instruction Module:  
Solving Problems  
with Inequalities**

In this Instruction Module, students will learn to write and solve inequalities of one variable so as to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Additional Resources

#### Math in the Real-world Videos

**Jet Fighter Pilot**

This jet fighter pilot discusses how mission planning and coordination involves solving equations. Before he ever gets in the cockpit, he uses his math skills to plan the mission.

#### Manipulatives

**Algebra Tiles**

This manipulative includes tiles that represent  $+1$  and  $-1$ ,  $+x$  and  $-x$ , and  $+x^2$  and  $-x^2$  that students can drag to a workspace to model multiplication of monomials and polynomials.

#### Activities

**Parade Float Design**

In this activity, students will practice writing and solving one-variable equations and inequalities under the context of designing a parade float.

#### Quiz

**6.10(A) Quiz**

This quiz assesses students' understanding and ability to model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts.

**6.10(B) Quiz**

This quiz assesses students' understanding and ability to determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.

### TEKS 6.11 (A) Measurement and data

**Topic: Points in a  
Coordinate Plane**

[TEKS 6.11 (A)] In this topic, students will learn to describe the location of and plot points in the coordinate plane using ordered pairs.

**Instruction Module:  
Writing Ordered  
Pairs**

In this Instruction Module, students will learn how to write ordered pairs for points in a coordinate plane. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module:  
Plotting Points in a  
Coordinate Plane**

In this Instruction Module, students will learn how, when given an ordered pair, to plot the point in a coordinate plane. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Additional Resources**

**Math in the Real-world Videos**

**U.S. Coast Guard Cadet**  
 Cadets and an instructor at the United Coast Guard Academy discuss the importance of math skills in navigating a coast guard vessel. Advanced skills such as algebra and trigonometry are used, but basic navigation requires understanding location as shown on a coordinate plane.

**Interactivities**

**United States Coast Guard - Positive and Negative Numbers**  
 In this interactivity, students will apply and extend their understanding of negative and positive numbers to identify latitudes and longitudes, and locate positions on a map.

**Quiz**

**6.11(A) Quiz**  
 This quiz assesses students' understanding and ability to graph points in all four quadrants using ordered pairs of rational numbers.

**Module name**      **TEKS 6.12 (A, B, C, D) Measurement and data**

**Topic: Finding Mean, Median, and Mode**  
 [TEKS 6.12 (A) (C) (D)] In this topic, students will learn to calculate the Mean, Median, and Mode of a data set.

**Instruction Module: Finding Mean, Median, and Mode**  
 In this Instruction Module, students will learn to find the mean, median, and mode of a data set.  
 The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Interpreting Graphs of Data**  
 [TEKS 6.12 (A)] In this topic, students will learn to read and interpret line graphs, bar graphs, and circle graphs.

**Instruction Module: Reading and Interpreting Bar Graphs**  
 In this Instruction Module, students will learn to read and interpret bar graphs.  
 The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Instruction Module: Reading and Interpreting Circle Graphs**  
 In this Instruction Module, students will learn to read and interpret circle graphs.  
 The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Analyzing and Describing Graphs** [TEKS 6.12 (A) (B) (C)] In this topic, students will learn to make comparisons using Box-and-Whisker Plots

**Instruction Module: Analyzing and Describing Graphs** In this Instruction Module, students will learn to use box and whisker plots to compare two data sets. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Dot Plots** [TEKS 6.12 (A)] In this topic, students will learn to represent numeric data graphically as a dot plot, and interpret numeric data summarized in dot plots.

**Lesson (Print): Dot Plots** In this lesson, students will learn to represent numeric data graphically as a dot plot, and interpret numeric data summarized in dot plots. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Percent Bar Graphs** [TEKS 6.12 (D)] In this topic, students will learn to summarize categorical data with numerical and graphical summaries, and describe the data distribution.

**Lesson (Print): Percent Bar Graphs** In this lesson, students will learn to summarize categorical data with numerical and graphical summaries, including percent of values in each category, percent bar graphs, and to use these summaries to describe the data distribution. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Wind Engineer** Wind Energy is one way to provide electrical power without creating carbon emissions. This engineer discusses the use of mathematics and especially algebra in her job. The designers use probability and statistics to analyze wind data so they can locate the turbines in the best place for optimal wind speeds.

**Water Quality Chemist** We take it for granted that our tap water is safe to drink, but we can be glad that water quality chemists are regularly sampling and testing the water to make sure that it is safe and meets all federal and state standards.

### Quiz

**6.12(A) Quiz** This quiz assesses students' understanding and ability to represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots.

|                     |   |
|---------------------|---|
| <b>6.12(B) Quiz</b> | This quiz assesses students' understanding and ability to use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution.  |
| <b>6.12(C) Quiz</b> | This quiz assesses students' understanding and ability to summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution. |
| <b>6.12(D) Quiz</b> | This quiz assesses students' understanding and ability to summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution.                   |

## TEKS 6.13 (A, B) Measurement and data

|   |  |
|---|--|
| <b>Topic: Finding Mean, Median, and Mode</b>                    | [TEKS 6.13 (A) (B)] In this topic, students will learn to calculate the Mean, Median, and Mode of a data set.  |
| <b>Instruction Module: Finding Mean, Median, and Mode</b>       | In this Instruction Module, students will learn to find the mean, median, and mode of a data set.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice and a Student Activity. |
| <b>Topic: Analyzing and Describing Graphs</b>                   | [TEKS 6.13 (A)] In this topic, students will learn to make comparisons using Box-and-Whisker Plots.  |
| <b>Instruction Module: Analyzing and Describing Graphs</b>      | In this Instruction Module, students will learn to use box and whisker plots to compare two data sets.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.               |
| <b>Topic: Interpreting Graphs of Data</b>                       | [TEKS 6.13 (A)] In this topic, students will learn to read and interpret line graphs, bar graphs, and circle graphs.   |
| <b>Instruction Module: Reading and Interpreting Line Graphs</b> | In this Instruction Module, students will learn to read and interpret line graphs.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                   |

**Instruction Module:  
Reading and  
Interpreting Bar  
Graphs**

In this Instruction Module, students will learn to read and interpret bar graphs.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice and a Student Activity.

**Instruction Module:  
Reading and  
Interpreting Circle  
Graphs**

In this Instruction Module, students will learn to read and interpret circle graphs.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Dot Plots**

[TEKS 6.13 (A)] In this topic, students will learn to represent numeric data graphically as a dot plot, and interpret numeric data summarized in dot plots.

**Lesson (Print): Dot  
Plots**

In this lesson, students will learn to represent numeric data graphically as a dot plot, and interpret numeric data summarized in dot plots.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Wind Engineer**

Wind Energy is one way to provide electrical power without creating carbon emissions. This engineer discusses the use of mathematics and especially algebra in her job. The designers use probability and statistics to analyze wind data so they can locate the turbines in the best place for optimal wind speeds.

**Water Quality  
Chemist**

We take it for granted that our tap water is safe to drink, but we can be glad that water quality chemists are regularly sampling and testing the water to make sure that it is safe and meets all federal and state standards.

### Quiz

**6.13(A) Quiz**

This quiz assesses students' understanding and ability to interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots.

**6.13(B) Quiz**

This quiz assesses students' understanding and ability to distinguish between situations that yield data with and without variability.

## TEKS 6.14 (A, B, C, D, E, F, G, H) Personal financial literacy

### Topic: Understanding Basic Banking

[TEKS 6.14 (A) (B)] In this topic, students will learn to compare the features and costs of a checking account and a debit card offered by different banks, and distinguish between credit cards and debit cards.

### Lesson (Print): Understanding Basic Banking

In this lesson, students will learn to compare the features and costs of a checking account and a debit card offered by different banks, and distinguish between credit cards and debit cards. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: Balance the Bank

[TEKS 6.14 (C)] In this topic, students will learn to balance a check register that includes deposits, withdrawals, and transfers.

### Lesson (Print): Balance the Bank

In this lesson, students will learn to balance a check register that includes deposits, withdrawals, and transfers. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: Personal Credit

[TEKS 6.14 (D) (E) (F)] In this topic, students will learn why it is important to establish a positive credit, describe the information in a credit report and how long it is retained, and describe the value of credit reports to borrowers and to lenders.

### Lesson (Print): Personal Credit

In this lesson, students will learn why it is important to establish a positive credit, describe the information in a credit report and how long it is retained, and describe the value of credit reports to borrowers and to lenders. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: College Funding

[TEKS 6.14 (G)] In this topic, students will explore and learn about the various ways to pay for college including savings, grants, scholarships, student loans, and work study.

### Lesson (Print): College Funding

In this lesson, students will explore and learn about the various ways to pay for college including savings, grants, scholarships, student loans, and work study. The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: Occupation Requirements

[TEKS 6.14 (H)] In this topic, students will compare the annual salaries of several occupations requiring various levels of post-secondary education or vocational training, and calculate the effects of different annual salaries on lifetime income.





**Lesson (Print):  
Occupation  
Requirements**

In this lesson, students will compare the annual salaries of several occupations requiring various levels of post-secondary education or vocational training, and calculate the effects of different annual salaries on lifetime income.

The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

**Careers**

In this video, James Langford of FES, talks about income and careers.

### Quiz

**6.14(A) Quiz**

This quiz assesses students' understanding and ability to compare the features and costs of a checking account and a debit card offered by different local financial institutions.

**6.14(B) Quiz**

This quiz assesses students' understanding and ability to distinguish between debit cards and credit cards.

**6.14(C) Quiz**

This quiz assesses students' understanding and ability to balance a check register that includes deposits, withdrawals, and transfers.

**6.14(D) Quiz**

This quiz assesses students' understanding and ability to explain why it is important to establish a positive credit history.

**6.14(E) Quiz**

This quiz assesses students' understanding and ability to describe the information in a credit report and how long it is retained.

**6.14(F) Quiz**

This quiz assesses students' understanding and ability to describe the value of credit reports to borrowers and to lenders.

**6.14(G) Quiz**

This quiz assesses students' understanding and ability to explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study.

**6.14(H) Quiz**

This quiz assesses students' understanding and ability to compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.

## Grade 7 Course Description

### TEKS 7.2 (A) Numbers and Operations

#### Topic: Define and Diagram Sets of Rational Numbers

[TEKS 7.2 (A)] In this topic, students will learn to use Venn diagrams to show set relationships and describe sets of numbers.

#### Instruction Module: Define and Diagram Sets of Rational Numbers

In this Instruction Module, students will learn to define and diagram sets of rational numbers. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Irrational and Real Number Sets

In this Instruction Module, students will learn to define and diagram the irrational and real number sets and locate real numbers approximately on the number line. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Additional Resources

#### Math in the Real-world Videos

#### Music Amplifier Designer

This designer of music amplifiers explains that now that music has become digital, creating that special sound requires an understanding of rational numbers.

#### Quiz

#### 7.2(A) Quiz

This quiz assesses students' understanding and ability to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.

### TEKS 7.3 (A, B) Numbers and Operations

#### Topic: Adding Integers

[TEKS 7.3 (A) (B)] In this topic, students will learn to model addition of integers using counters and a number line, add integers, and find absolute value.

#### Instruction Module: Adding Integers Using Counters

In this Instruction Module, students will learn to add integers using counters.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Adding Integers Using a Number Line

In this Instruction Module, students will learn to add integers using a number line.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Adding Integers Using Rules

In this Instruction Module, students will learn to add integers using rules.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Topic: Subtracting Integers

[TEKS 7.3(A) (B)] In this topic, students will learn to model subtraction of integers using counters and a number line, and subtract integers.

#### Instruction Module: Subtracting Integers Using Counters

In this Instruction Module, students will learn to subtract integers using counters.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Subtracting Integers Using a Number Line

In this Instruction Module, students will learn to subtract integers using a number line.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Subtracting Integers Using Rules

In this Instruction Module, students will learn to subtract integers using rules.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Topic: Multiplying and Dividing Integers

[TEKS 7.3 (A) (B)] In this topic, students will learn to model multiplication of integers using physical objects and pictures, and multiply and divide integers.

#### Instruction Module: Multiplying Integers Using Counters

In this Instruction Module, students will learn to multiply integers using counters.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

|  |   |
|--|---|
| <b>Instruction Module:<br/>Multiplying Integers<br/>Using a Number<br/>Line</b>      | In this Instruction Module, students will learn to multiply integers using a number line.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Multiplying and<br/>Dividing Integers<br/>Using Rules</b> | In this Instruction Module, students will learn to multiply and divide integers using rules.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Problem<br/>Solving with<br/>Integers</b>                                  | [TEKS 7.3 (B)] In this topic, students will learn to read, write, compare, and solve problems involving integers.   |
| <b>Instruction Module:<br/>Draining a<br/>Swimming Pool</b>                          | In this Instruction Module, students will learn to use integer operations to compute the time needed to drain or fill a pool using the ideas of rate and time.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                    |
| <b>Instruction Module:<br/>Elevation Changes</b>                                     | In this Instruction Module, students will learn to use integer operations to compute changes of elevation using the ideas of rate and time.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                       |
| <b>Topic: Adding and<br/>Subtracting<br/>Decimals</b>                                | [TEKS 7.3 (A) (B)] In this topic, students will learn to estimate decimal sums and differences using rounding and front-end estimation, model addition and subtraction of decimals, and develop and use algorithms to add and subtract numbers containing decimals. |
| <b>Instruction Module:<br/>Estimation of<br/>Decimal Sums and<br/>Differences</b>    | In this Instruction Module, students will learn to estimate decimal sums and differences using rounding and front-end estimation.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Model Decimal<br/>Addition-Standard<br/>Algorithm</b>     | In this Instruction Module, students will learn to model decimal addition using the standard algorithm.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Subtracting<br/>Decimals Using<br/>Models</b>             | In this Instruction Module, students will learn to model the subtraction of decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Standard Decimal<br/>Subtraction</b>                      | In this Instruction Module, students will learn to subtract decimals using the standard algorithm.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |



|  |   |
|--|---|
| <b>Topic: Multiplying Decimals</b>                               | [TEKS 7.3 (A) (B)] In this topic, students will learn to estimate products using rounding and compatible numbers, model multiplication of decimals, and develop and use algorithms to multiply decimals.                        |
| <b>Instruction Module: Modeling Multiplication of Decimals</b>   | In this Instruction Module, students will learn to model the multiplication of decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Multiplying Decimals by Powers of Ten</b> | In this Instruction Module, students will learn to multiply decimals by powers of ten.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Estimating Decimal Products</b>           | In this Instruction Module, students will learn to estimate decimal products using rounding and compatible numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                           |
| <b>Instruction Module: Multiplying Decimals: Standard Model</b>  | In this Instruction Module, students will learn to multiply decimals using the standard model.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Dividing Decimals</b>                                  | [TEKS 7.3 (A) (B)] In this topic, students will learn to estimate quotients using rounding and compatible numbers, model division of decimals, and develop and use algorithms to divide decimals by whole numbers and decimals. |
| <b>Instruction Module: Estimating Quotients</b>                  | In this Instruction Module, students will learn to estimate quotients using front-end estimation, rounding and compatible numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.            |
| <b>Instruction Module: Dividing Decimals Using Models</b>        | In this Instruction Module, students will learn to divide decimals using models.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Dividing Decimals by Whole Numbers</b>    | In this Instruction Module, students will learn to divide decimals by whole numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Dividing Decimals by Decimals</b>         | In this Instruction Module, students will learn to divide decimals by decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |

|   |  |
|---|--|
| <b>Topic: Fractions with Like Denominators</b>                          | <p>[TEKS 7.3 (A) (B)] In this topic, students will learn to use models, and develop and use algorithms to add and subtract fractions with like denominators.</p>   |
| <b>Instruction Module: Adding Fractions with Like Denominators</b>      | <p>In this Instruction Module, students will learn to model addition of fractions with like denominators using diagrams and/or illustrations of manipulatives.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>      |
| <b>Instruction Module: Subtracting Fractions with Like Denominators</b> | <p>In this Instruction Module, students will learn to model subtraction of fractions with like denominators using diagrams and/or illustrations of manipulatives.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Topic: Adding Fractions with Unlike Denominators</b>                 | <p>[TEKS 7.3 (A) (B)] In this topic, students will learn to find equivalent fractions, use models, and develop and use algorithms to add fractions with unlike denominators.</p>   |
| <b>Instruction Module: Add Fractions with Unlike Denominators - 1</b>   | <p>In this Instruction Module, students will learn to model addition of fractions with unlike denominators using diagrams and/or illustrations of manipulatives.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>    |
| <b>Instruction Module: Add Fractions with Unlike Denominators - 2</b>   | <p>In this Instruction Module, students will learn to develop and use algorithms to add fractions with unlike denominators.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Topic: Subtract Fractions with Unlike Denominators</b>               | <p>[TEKS 7.3 (A) (B)] In this topic, students will learn to find equivalent fractions, use models, and develop and use algorithms to subtract fractions with unlike denominators.</p>  |
| <b>Instruction Module: Subtract Fractions with Unlike Denominators</b>  | <p>In this Instruction Module, students will learn to model subtraction of fractions with unlike denominators using diagrams and/or illustrations of manipulatives.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <b>Instruction Module: Subtracting Fractions Using the LCM/LCD</b>      | <p>In this Instruction Module, students will learn to develop and use algorithms to subtract fractions with unlike denominators.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                                    |
| <b>Topic: Adding and Subtracting Mixed Numbers</b>                      | <p>[TEKS 7.3(A)(B)] In this topic, students will learn to use models, and develop and use algorithms to add and subtract mixed numbers.</p>  |

|   |  |
|---|--|
| <b>Instruction Module:<br/>Adding Mixed<br/>Numbers</b>                             | In this Instruction Module, students will learn to model addition and subtraction of mixed numbers using diagrams and/or illustrations of manipulatives.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module:<br/>Subtraction of<br/>Mixed Numbers</b>                     | In this Instruction Module, students will learn to develop and use algorithms to subtract mixed numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Dividing<br/>Fractions</b>  | [TEKS 7.3 (A) (B)] In this topic, students will learn to model division of fractions using diagrams and illustrations of manipulatives, and develop and use algorithms for dividing fractions.   |
| <b>Instruction Module:<br/>Inverting and<br/>Multiplying</b>                        | In this Instruction Module, students will learn to divide fractions using models and the invert-and-multiply algorithm.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                  |
| <b>Instruction Module:<br/>Using a Common<br/>Denominator</b>                       | In this Instruction Module, students will learn to divide fractions using models and the common denominator algorithm.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                   |
| <b>Topic: Operations<br/>with Integers</b>  | [TEKS 7.3 (A)] In this topic, students will learn to add, subtract, multiply, and divide integers.   |
| <b>Instruction Module:<br/>Adding and<br/>Subtracting Integers</b>                  | In this Instruction Module, students will learn to add and subtract Integers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module:<br/>Multiplying and<br/>Dividing Integers</b>                | In this Instruction Module, students will learn to multiply and divide Integers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Properties of<br/>Operations -<br/>Fractions and<br/>Decimals</b>         | [TEKS 7.3 (A)] In this topic, students will learn to add, subtract, multiply, and divide fractions and decimals.   |
| <b>Instruction Module:<br/>Applying Properties<br/>Of Operations-<br/>Fractions</b> | In this Instruction module, students will learn to add, subtract, multiply and divide fractions.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module:<br/>Applying Properties<br/>of Operations -<br/>Decimals</b> | In this Instruction module, students will learn to add, subtract, multiply and divide decimals.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |

**Topic: Solving Multi-step Linear Equations**

[TEKS 7.3 (B)] In this topic, students will learn to solve multi-step linear equations and model it using algebra tiles.

**Instruction Module: Solving Multi-step Linear Equations-I**

In this Instruction Module, students will learn to solve multi-step linear equations with variables on both sides of the equation. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Solving Multi-step Linear Equations-II**

In this Instruction Module, students will learn to solve multi-step equations using the Distributive Property and solve multi-step equations with rational numbers. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Solve Equations Using Algebra Tiles**

In this Instruction Module, students will learn to use algebra tiles to solve linear equations. The IM is supported by Student Notes and Teacher Notes.

## Additional Resources

### Math in the Real-world Videos

**Stunt Pilot**

A stunt pilot shows the importance of understanding the number line in flying an airplane and performing stunts. The gauges on an airplane function very much like number lines. The pilot must use data from the instruments and perform operations with positive and negative integers to perform daring stunts.

**Costume Designer**

In this video, a costume designer explains that budgeting and tracking expenses are major parts of her job. In order to be successful in managing her design projects, she must be able to perform operations with decimals.

**Jazz Musician**

A jazz musician explains that all musical notation is based on the mathematical concept of fractions. In order to understand note values, a musician must understand fractions. Adding, subtracting, multiplying, dividing, and converting fractions are skills a jazz musician must have.

### Interactivities

**Airplane Gauges**

In this interactivity students, will apply their understanding of operations with integers. Students will use integer addition, subtraction, multiplication, and division to find changes in altitude and rates of ascent or descent of an airplane.

**Math, Music, Money, and Measuring**

In this interactivity, students will apply their understanding of division of fractions by fractions to solve word problems.

### Manipulatives



|   |   |
|---|---|
| <b>Color Counters Manipulatives</b>       | This manipulative includes two-colored counters to represent positive and negative integers. Students can drag integers, operators, and counters to model addition, subtraction, multiplication, and division of integers.  |
| <b>Place Value Manipulatives</b>          | This manipulative includes place value charts for whole numbers and decimals. Students can use the charts to compare, order, add, subtract, multiply, or divide whole numbers or decimals.  |
| <b>Fraction-Strips Manipulatives</b>      | This manipulative includes fraction strips that represent one whole, $\frac{1}{2}$ , $\frac{1}{3}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{1}{6}$ , $\frac{1}{8}$ , $\frac{1}{10}$ , and $\frac{1}{12}$ , which the students can use to compare, order, and find equivalent fractions. |
| <b>Number Line Manipulatives</b>          | This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.               |
| <b>Problem Solving</b>                    |   |
| <b>Integers</b>                           | This item guides students through the processes of solving real-world and mathematical problems. Students will add and multiply positive and negative integers to solve a problem.  |
| <b>Activities</b>                         |   |
| <b>Airplane Gauges (Fly an Airplane!)</b> | In this Activity, students will practice adding, subtracting, and performing mixed operations with rational numbers under the context of airplane altitude and vertical airspeed.   |
| <b>Quiz</b>                               |   |
| <b>7.3(A) Quiz</b>                        | This quiz assesses students' understanding and ability to add, subtract, multiply, and divide rational numbers fluently.  |
| <b>7.3(B) Quiz</b>                        | This quiz assesses students' understanding and ability to apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.   |

### TEKS 7.4 (A, B, C, D, E) Proportionality

#### Topic: Ratios, Rates, and Proportional Reasoning

[TEKS 7.4 (A) (B) (C) (D)] In this topic, students will learn to write ratios as fractions in simplest form, determine unit rates, and use proportional reasoning and ratios to represent problem situations.

#### Instruction Module: Ratios, Rates, and Unit Rates

In this Instruction Module, students will explore unit rates and unit costs.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Problem Solving with Ratios and Proportions

In this Instruction Module, students will learn to use ratios and proportions to solve problems.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

#### Instruction Module: Comparing Rates

In this Instruction Module, students will learn to compare rates using a table.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

#### Topic: Percent Proportions

[TEKS 7.4 (D)] In this topic, students will learn to use the percent proportion to write fractions as percents, estimate a percent of a number, and solve problems in real-world situations using percentages.

#### Instruction Module: Writing Fractions as Percentages

In this Instruction Module, students will learn to write fractions as percents.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Estimating the Percent of a Number

In this Instruction Module, students will learn to estimate a percent of a number.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Solving Problems with Percentages

In this Instruction Module, students will learn to solve problems with percentages.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

#### Topic: Same System Conversions

[TEKS 7.4 (E)] In this topic, students will learn to make conversions within the same measurement system, either customary or metric, and make conversions using time in real-world problems.

#### Instruction Module: Converting Customary Units

In this Instruction Module, students will learn to make conversions within the customary measurement system in real-world problems (feet to inches, quarts to gallons, etc.).

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Converting Metric Units**  
 In this Instruction Module, students will learn to make conversions within metric measurement system in real-world problems (e.g. meters to centimeters, liters to milliliters, etc.)  
 The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Instruction Module: Converting Time Units**  
 In this Instruction Module, students will learn to make conversions using time in real-world problems (e.g. hours, to minutes to seconds).  
 The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

## Additional Resources

### Math in the Real-world Videos

**Performance Car Designer**  
 Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance.

**Retail Store Manager**  
 This retail store manager talks about the importance of math in running her store. Percentages are used to compute mark-ups, discounts, and sales tax.

**Triathlete**  
 This triathlete talks about how important it is to understand rates, unit rates, and conversion of measurement units in training for a triathlon.

### Interactivities

**Triathlon Interactivity**  
 In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units.

**Gas Station Interactivity**  
 In this interactivity, students will apply their understanding of proportional relationships. They will recognize the proportional relationship between the values on a gas pump display (the unit rate, the quantity of gas purchased, and the total cost) to find one of the values when the other two are known.

### Problem Solving

**Comparing Ratios**  
 This item guides students through the processes of solving real-world and mathematical problems. Students will analyze and use proportional relationships, and compare their graphs to solve a problem.

| Activities         |  |
|--------------------|--|
| <b>Gas Station</b> | In this activity, students will practice solving problems with proportional relationships under the context of gasoline purchases.   |
| <b>Triathlon</b>   | In this activity, students will practice identifying proportional relationships and calculating rates of change in the context of triathlon events.  |
| Quiz               |  |
| <b>7.4(A) Quiz</b> | This quiz assesses students' understanding and ability to represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$ |
| <b>7.4(B) Quiz</b> | This quiz assesses students' understanding and ability to calculate unit rates from rates in mathematical and real-world problems.   |
| <b>7.4(C) Quiz</b> | This quiz assesses students' understanding and ability to determine the constant of proportionality ( $k = y/x$ ) within mathematical and real-world problems.   |
| <b>7.4(D) Quiz</b> | This quiz assesses students' understanding and ability to solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.              |
| <b>7.4(E) Quiz</b> | This quiz assesses students' understanding and ability to convert between measurement systems, including the use of proportions and the use of unit rates.   |

| TEKS 7.5 (A, B, C) Proportionality                 |   |
|--|---|
| <b>Topic: Similar Triangles</b>                    | [TEKS 7.5 (A) (C)] In this topic, students will learn to develop and use the properties of similar triangles (ratio of sides and congruent angles) to solve problems involving similar triangles.             |
| <b>Instruction Module: Similar Triangles</b>       | In this Instruction Module, students will learn to define similar triangles and the AA and SSS similarity rules for triangles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Using Similar Triangles</b> | In this Instruction Module, students will learn to solve problems involving similar triangles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                 |

|  |   |
|--|---|
| <b>Topic: Circumference</b>                            | [TEKS 7.5 (B)] In this topic, students will learn to use formulas to solve problems involving circumference of a circle.  |
| <b>Instruction Module: Circumference: Part One</b>     | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Circumference: Part Two</b>     | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Similar Polygons</b>                         | [TEKS 7.5 (A) (C)] In this topic, students will learn to identify similar figures, explore and develop the properties of similar figures (ratio of sides and congruent angles), and apply proportional reasoning to solve problems involving congruent or similar shapes. |
| <b>Instruction Module: Similar Polygons</b>            | In this Instruction Module, students will learn to identify characteristics of similar polygons. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Finding Unknown Lengths</b>     | In this Instruction Module, students will learn to use proportions to find lengths of unknown sides in similar polygons. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Enlargements and Reductions</b> | In this Instruction Module, students will learn of the different properties of similar figures, including the ideas of ratio of sides and congruent angles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                |
| <b>Instruction Module: Scale Drawings</b>              | In this Instruction Module, students will learn to create scale drawings. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |

## Additional Resources

### Math in the Real-world Videos

#### 3- D Animator

Creating 3-D characters for film and television is an exciting job which involves the understanding of both two-dimensional and three-dimensional shapes. This animator draws polygons freehand and with technology to develop entertaining cartoon characters.



|                                |  |
|--------------------------------|--|
| <b>Architect</b>               | This architect discusses the role of math in his profession. He specifically discusses how an understanding of triangles was essential in the design of the Griffith Observatory.  |
|                                | <b>Interactivities</b>   |
| <b>Center Pivot Irrigation</b> | In this interactivity, students will recognize the circular and square shapes formed in fields irrigated by a center pivot system. They will use these to explore the relationship of the circumference and area of a circle to the perimeter and area of a square of sides equal to the diameter of the circle. |
|                                | <b>Activities</b>  |
| <b>Center Pivot Irrigation</b> | In this Activity, students will analyze the relationships among perimeter, circumference, and area of circles inscribed in squares, and practice calculating the area of circles in the context of irrigating farmland.  |
|                                | <b>Quiz</b>  |
| <b>7.5(A) Quiz</b>             | This quiz assesses students' understanding and ability to generalize the critical attributes of similarity, including ratios within and between similar shapes.  |
| <b>7.5(B) Quiz</b>             | This quiz assesses students' understanding and ability to describe $\pi$ as the ratio of the circumference of a circle to its diameter.  |
| <b>7.5(C) Quiz</b>             | This quiz assesses students' understanding and ability to solve mathematical and real-world problems involving similar shape and scale drawings.   |

## TEKS 7.6 (A, B, C, D, E, F, G, H, I) Proportionality

### Topic: Finding Permutations and Combinations

[TEKS 7.6 (A) (B) (C) (D) (E) (I)] In this topic, students will learn to use the Fundamental Counting Principle to determine the number of potential outcomes for compound events, and find permutations and combinations.

### Instruction Module: The Fundamental Counting Principle

In this Instruction Module, students will learn to use Tree Diagrams and the Fundamental Counting Principle to determine the number of potential outcomes for compound events. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

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| <b>Instruction Module:<br/>Factorials,<br/>Permutations, and<br/>Combinations</b> | In this Instruction Module, students will learn to evaluate factorials and find permutations and combinations.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.     |
| <b>Topic: Solving Basic Probability Problems</b>                                  | [TEKS 7.6 (A) (B) (C) (D) (E) (H) (I)] In this topic, students will learn to define and use experimental and theoretical probability, and solve basic probability problems.                          |
| <b>Instruction Module:<br/>Experimental and<br/>Theoretical<br/>Probability</b>   | In this Instruction Module, students will learn to define and use experimental and theoretical probability.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.        |
| <b>Instruction Module:<br/>Complementary<br/>Events</b>                           | In this Instruction Module, students will learn to find the probability of a complement of an event.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.               |
| <b>Topic: Solving<br/>Advanced<br/>Probability<br/>Problems</b>                   | [TEKS 7.6 (A) (B) (C) (D) (E) (I)] In this topic, students will learn to find the probability of independent and dependent variables and solve probability problems.                                 |
| <b>Instruction Module:<br/>Independent Events</b>                                 | In this Instruction Module, students will learn to find the probability of independent events.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
| <b>Instruction Module:<br/>Dependent Events</b>                                   | In this Instruction Module, students will learn to find the probability of dependent events.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                       |
| <b>Topic: Interpreting<br/>Graphs of Data</b>                                     | [TEKS 7.6 (G)] In this topic, students will learn to read and interpret line graphs, bar graphs, and circle graphs.  |
| <b>Instruction Module:<br/>Reading and<br/>Interpreting Line<br/>Graphs</b>       | In this Instruction Module, students will learn to read and interpret line graphs.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                 |
| <b>Instruction Module:<br/>Reading and<br/>Interpreting Bar<br/>Graphs</b>        | In this Instruction Module, students will learn to read and interpret bar graphs.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.              |
| <b>Instruction Module:<br/>Reading and<br/>Interpreting Circle<br/>Graphs</b>     | In this Instruction Module, students will learn to read and interpret circle graphs.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                               |

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| <b>Topic: Solving Statistics Problems</b>          | [TEKS 7.6 (F)] In this topic, students will learn to find the deviation from the Mean and Mean Absolute Deviation problems.  |
| <b>Instruction Module: Mean Absolute Deviation</b> | In this Instruction Module, students will learn to calculate and use deviations from the mean as well as the mean absolute deviation. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |

**Additional Resources**

**Math in the Real-world Videos**

|                         |  |
|-------------------------|--|
| <b>Forestry Service</b> | A wildlife biologist and a forester discuss how sampling plays an important role in their jobs. The use of sampling is an important tool for them in estimating the population of deer or the growth rates of trees. |
|-------------------------|--|

**Quiz**

|                    |  |
|--------------------|--|
| <b>7.6(A) Quiz</b> | This quiz assesses students' understanding and ability to represent sample spaces for simple and compound events using lists and tree diagrams.  |
| <b>7.6(B) Quiz</b> | This quiz assesses students' understanding and ability to select and use different simulations to represent simple and compound events with and without technology.  |
| <b>7.6(C) Quiz</b> | This quiz assesses students' understanding and ability to make predictions and determine solutions using experimental data for simple and compound events.   |
| <b>7.6(D) Quiz</b> | This quiz assesses students' understanding and ability to make predictions and determine solutions using theoretical probability for simple and compound events.   |
| <b>7.6(E) Quiz</b> | This quiz assesses students' understanding and ability to find the probabilities of a simple event and its complement and describe the relationship between the two.   |
| <b>7.6(F) Quiz</b> | This quiz assesses students' understanding and ability to use data from a random sample to make inferences about a population.   |
| <b>7.6(G) Quiz</b> | This quiz assesses students' understanding and ability to solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents. |
| <b>7.6(H) Quiz</b> | This quiz assesses students' understanding and ability to solve problems using qualitative and quantitative predictions and comparisons from simple experiments.   |
| <b>7.6(I) Quiz</b> | This quiz assesses students' understanding and ability to determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.                                 |



**TEKS 7.7 (A) Expressions, equations, and relationships**

**Topic: Graphing Linear Equations of Two Variables**

[TEKS 7.7 (A)] In this topic, students will learn to graph linear equations of two variables.

**Instruction Module: Graphing Linear Equations of Two Variables-I**

In this Instruction Module, students will learn to graph linear equations from a data table, and graph linear equations using the intercept method.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Instruction Module: Graphing Linear Equations of Two Variables-II**

In this Instruction Module, students will learn to graph linear equations of two variables using the slope-intercept method.

The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Additional Resources**

**Math in the Real-world Videos**

**Thrill Ride Engineer**

Those exciting theme park thrill rides can only be designed and built by people with knowledge of mathematics. This thrill ride engineer explains how mathematical calculations including slope are needed in designing safe and exciting thrill rides.

**Activities**

**Thrill Ride Engineer**

In this activity, students will practice representing linear relationships using tables, graphs, equations, and verbal representations under the context of designing thrill rides and show equipment.

**Quiz**

**7.7(A) Quiz**

This quiz assesses students' understanding and ability to represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form  $y = mx + b$ .

**TEKS 7.8 (A, B, C) Expressions, equations, and relationships**

**Topic: Volume: Pyramids**

[TEKS 7.8 (A)] In this topic, students will learn to derive and use formulas for volume of pyramids, and express volume in correct units.

**Instruction Module: Volume of a Pyramid**

In this Instruction Module, students will learn to derive and use formulas for volume of pyramids.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

|   |   |
|---|---|
| <b>Topic: Circumference</b>   | [TEKS 7.8 (C)] In this topic, students will learn to use formulas to solve problems involving circumference of a circle.  |
| <b>Instruction Module: Circumference: Part One</b>                            | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                |
| <b>Instruction Module: Circumference: Part Two</b>                            | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                |
| <b>Topic: Area of a Circle</b>  | [TEKS 7.8 (C)] In this topic, student will learn to develop and use strategies to solve problems involving the area of a circle.  |
| <b>Instruction Module: Area of a Circle</b>                                   | In this Instruction Module, students will be learn to solve real-world and mathematical problems involving the area of circles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                    |
| <b>Topic: Circumference and Area of Circles</b>                               | [TEKS 7.8 (C)] In this topic, students will learn to determine approximate formulas for calculating the circumference and area of circles.  |
| <b>Lesson (Print): Circumference and Area of Circles</b>                      | In this lesson, students will learn to use models to determine approximate formulas for calculating the circumference and area of circles. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
| <b>Topic: Volume of Prisms and Pyramids</b>                                   | [TEKS 7.8 (A) (B)] In this topic, students will learn to connect the relationship between volume of prisms and pyramids.  |
| <b>Lesson (Print): Relationship Between the Volume of Prisms and Pyramids</b> | In this lesson, students will learn to use models of prisms to connect the relationship between volume of prisms and pyramids. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.             |

## Additional Resources

| Math in the Real-world Videos  |  |
|--------------------------------|--|
| <b>Architect</b>               | This architect discusses the role of math in his profession. He specifically discusses how an understanding of triangles was essential in the design of the Griffith Observatory.  |
| Interactivities                |  |
| <b>Center Pivot Irrigation</b> | In this interactivity, students will recognize the circular and square shapes formed in fields irrigated by a center pivot system. They will use these to explore the relationship of the circumference and area of a circle to the perimeter and area of a square of sides equal to |



the diameter of the circle.

|                                | <b>Activities</b>   |
|--------------------------------|---|
| <b>Center Pivot Irrigation</b> | In this activity, students will analyze the relationships among perimeter, circumference, and area of circles inscribed in squares and practice calculating the area of circles in the context of irrigating farmland.  |
|                                | <b>Quiz</b>   |
| <b>7.8(A) Quiz</b>             | This quiz assesses students' understanding and ability to model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas.                           |
| <b>7.8(B) Quiz</b>             | This quiz assesses students' understanding and ability to explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas. |
| <b>7.8(C) Quiz</b>             | This quiz assesses students' understanding and ability to use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas.  |

## TEKS 7.9 (A, B, C, D) Expressions, equations, and relationships

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|--|--|
| <b>Topic: Circumference</b>                        | [TEKS 7.9 (B)] In this topic, students will learn to use formulas to solve problems involving circumference of a circle.   |
| <b>Instruction Module: Circumference: Part One</b> | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Circumference: Part Two</b> | In this Instruction Module, students will be learn the formula for the circumference of a circle and will use it to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Topic: Area of a Circle</b>                     | [TEKS 7.9 (B)] In this topic, student will learn to develop and use strategies to solve problems involving the area of a circle.   |
| <b>Instruction Module: Area of a Circle</b>        | In this Instruction Module, students will learn to solve real-world and mathematical problems involving the area of circles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.        |

|   |  |
|---|--|
| <b>Topic: Area of Combined Shapes</b>                                 | [TEKS 7.9 (C)] In this topic, students will learn to estimate and calculate the area of irregular two-dimensional shapes by dividing them into basic shapes.   |
| <b>Instruction Module: Area of Triangles, Trapezoids, and Circles</b> | In this Instruction Module, students will learn to solve real-world and mathematical problems involving the area of triangles, trapezoids and circles.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.   |
| <b>Instruction Module: Area of Combined Shapes</b>                    | In this Instruction Module, students will learn to solve problems involving the area of combined shapes.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Building Models</b>   | [TEKS 7.9 (D)] In this topic, students will learn to identify two-dimensional patterns (nets) for three-dimensional solids, and build three-dimensional solids from two-dimensional patterns (nets).   |
| <b>Instruction Module: Nets for Three-Dimensional Figures</b>         | In this Instruction Module, students will learn to identify two-dimensional patterns (nets) for three-dimensional solids such as prisms and pyramids, and build three-dimensional solids from two-dimensional patterns (nets).<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Topic: Surface Area of a Prism</b>                                 | [TEKS 7.9 (D)] In this topic, students will learn to apply formulas to solve problems involving the surface area of prisms.  |
| <b>Instruction Module: Surface Area of a Prism</b>                    | In this Instruction Module, students will learn to solve problems involving the surface area of a prism.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Surface Area of Pyramids</b>                                | [TEKS 7.9 (D)] In this topic, students will learn to apply formulas to solve problems involving the surface area of pyramids.  |
| <b>Instruction Module: Surface Area of Pyramids</b>                   | In this Instruction Module, students will learn to use square units to find the surface area of pyramids.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Volume of Prisms</b>  | [TEKS 7.9 (A)] In this topic, students will learn to apply formulas to solve problems involving the volume of rectangular prisms.  |
| <b>Instruction Module: Volume of a Rectangular Prism</b>              | In this Instruction Module, students will learn to solve problems involving the volume of rectangular prisms.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Volume: Pyramids</b>  | [TEKS 7.9 (A)] In this topic, students will learn to derive and use formulas for volume of pyramids, and express volume in correct units.  |

**Instruction Module:** In this Instruction Module, students will learn to derive and use formulas for volume of pyramids.  
**Volume of a Pyramid** The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Surface Area Of Prisms and Pyramids** [TEKS 7.9 (D)] In this topic, students will learn to calculate total and lateral surface area of prisms and pyramids using the area of the nets which create the 3-dimensional figures.

**Lesson (Print): Surface Area Of Prisms and Pyramids** In this lesson, students will learn to calculate total and lateral surface area of prisms and pyramids using the area of the nets which create the 3-dimensional figures.  
 The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Volume of Prisms and Pyramids** [TEKS 7.9 (A)] In this topic, students will learn the relationship between the volumes of prisms and pyramids.

**Lesson (Print): Relationship Between the Volume of Prisms and Pyramids** In this lesson, students will learn to use models of prisms to connect the relationship between volume of prisms and pyramids.  
 The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Baseball Stadium Groundskeeper**

The Groundskeeper for Dodger Stadium shows that geometry skills are important to his job. Before he can determine how much fertilizer is needed or how much topsoil to purchase, he must use his geometry skills such as determining area by decomposing an irregular shape into triangles and rectangles and computing the volume of a right rectangular prism.

**Old Navy Stocking Supervisor**

A stocking supervisor at an Old Navy distribution center explains the importance of mathematical operations with multi-digit numbers in determining the number of articles that will be received from the factories and delivered to the stores.

### Interactivities

**Center Pivot Irrigation**

In this interactivity, students will recognize the circular and square shapes formed in fields irrigated by a center pivot system. They will use these to explore the relationship of the circumference and area of a circle to the perimeter and area of a square of sides equal to the diameter of the circle.

### Activities

**Center Pivot Irrigation**

In this activity, students will analyze the relationships among perimeter, circumference, and area of circles inscribed in squares and practice calculating the area of circles in the context of irrigating farmland.

|                    | Quiz  |
|--------------------|---|
| <b>7.9(A) Quiz</b> | This quiz assesses students' understanding and ability to solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids.  |
| <b>7.9(B) Quiz</b> | This quiz assesses students' understanding and ability to determine the circumference and area of circles.  |
| <b>7.9(C) Quiz</b> | This quiz assesses students' understanding and ability to determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles.                              |
| <b>7.9(D) Quiz</b> | This quiz assesses students' understanding and ability to solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net. |

## TEKS 7.10 (A, B, C) Expressions, equations, and relationships

### Topic: Translating Sentences into Algebraic Equations

[TEKS 7.10 (A) (C)] In this topic, students will learn to translate sentences into algebraic equations and write equations to represent real-world situations.

### Instruction Module: Writing Sentences as Algebraic Equations

In this Instruction Module, students will learn to write sentences as algebraic equations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Writing Equations for Real-World Situations

In this Instruction Module, students will learn to write algebraic equations to represent real-world situations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Solving Two-Step Linear Equations

[TEKS 7.10 (B)] In this topic, students will learn to solve problems involving two-step linear equations, and model it using algebra tiles.

### Instruction Module: Solving Equations by Working Backwards

In this Instruction Module, students will learn to solve two-step linear equations by working backwards. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

|  |   |
|--|---|
| <b>Instruction Module: Explaining the Steps in Problem Solving</b> | In this Instruction Module, students will learn to provide reasons for each step in solving a two-step linear equation. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Modeling and Solving with Algebra Tiles</b> | In this Instruction Module, students will learn to use Algebra Tiles to model and solve equations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Solving Two-Step Linear Inequalities</b>                 | [TEKS 7.10 (B) (C)] In this topic, students will learn to solve two-step linear inequalities.   |
| <b>Instruction Module: Solving Two-step Linear Inequalities</b>    | In this Instruction Module, students will learn to solve two-step linear inequalities in situations where the inequality symbol does reverse and does not reverse. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Topic: Problems Using Inequalities of One Variable</b>          | [TEKS 7.10 (A)] In this topic, students will learn to solve problems using inequalities of one variable.  |
| <b>Instruction Module: Solving Problems with Inequalities</b>      | In this Instruction Module, students will learn to write and solve inequalities of one variable so as to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |

## Additional Resources

### Math in the Real-world Videos

|                        |  |
|------------------------|--|
| <b>Rose Bowl Float</b> | To build a beautiful float for the Rose Bowl Parade requires the extensive use of equations and inequalities. This designer must work within constraints of height, width, and weight. |
|------------------------|--|

### Manipulatives

|                                    |   |
|------------------------------------|---|
| <b>Algebra Tiles Manipulatives</b> | This manipulative includes tiles that represent +1 and -1, +x and -x, and +x <sup>2</sup> and -x <sup>2</sup> that students can drag to a workspace to model multiplication of monomials and polynomials.   |
| <b>Number Line Manipulatives</b>   | This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals. |

### Activities

|                            |   |
|----------------------------|---|
| <b>Parade Float Design</b> | In this activity, students will practice writing and solving one-variable equations and inequalities under the context of designing a parade float. |
|----------------------------|---|

### Quiz

|                     |   |
|---------------------|---|
| <b>7.10(A) Quiz</b> | This quiz assesses students' understanding and ability to write one-variable, two-step equations and inequalities to represent constraints or conditions within problems. |
| <b>7.10(B) Quiz</b> | This quiz assesses students' understanding and ability to represent solutions for one-variable, two-step equations and inequalities on number lines.                      |
| <b>7.10(C) Quiz</b> | This quiz assesses students' understanding and ability to write a corresponding real-world problem given a one-variable, two-step equation or inequality.                 |

## TEKS 7.11 (A, B, C) Expressions, equations, and relationships

### Topic: Solving Two-Step Linear Equations

[TEKS 7.11 (A) (B)] In this topic, students will learn to solve problems involving two-step linear equations, and model it using algebra tiles.

### Instruction Module: Solving Equations by Working Backwards

In this Instruction Module, students will learn to solve two-step linear equations by working backwards. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Explaining the Steps in Problem Solving

In this Instruction Module, students will learn to provide reasons for each step in solving a two-step linear equation. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Instruction Module: Modeling and Solving with Algebra Tiles

In this Instruction Module, students will learn to use Algebra Tiles to model and solve equations. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Solving Two-Step Linear Inequalities

[TEKS 7.11 (A) (B)] In this topic, students will learn to solve two-step linear inequalities.

### Instruction Module: Solving Two-step Linear Inequalities

In this Instruction Module, students will learn to solve two-step linear inequalities in situations where the inequality symbol does reverse and does not reverse. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.



|  |  |
|--|--|
| <b>Topic: Triangles</b>                                  | [TEKS 7.11 (C)] In this topic, students will learn to identify, describe, draw, and classify triangles, and determine the sum of the measures of interior angles of triangles.                 |
| <b>Instruction Module: Triangle Sum Property</b>         | In this Instruction Module, student will learn to define and use the triangle sum property.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                  |
| <b>Topic: Angles of Quadrilaterals</b>                   | [TEKS 7.11 (C)] In this topic, In this topic, students will determine the sum of the measures of interior angles of quadrilaterals, and find the missing measure of a quadrilateral.           |
| <b>Instruction Module: Angles of Quadrilaterals</b>      | In this Instruction Module, student will learn to find the missing measure of a quadrilateral.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.               |
| <b>Topic: Write Equations to Solve Geometry Problems</b> | [TEKS 7.11 (C)] In this topic, students will learn to solve perimeter and angle problems using equations of one variable.  |
| <b>Instruction Module: Perimeter Problems</b>            | In this Instruction Module, students will learn to solve perimeter problems using equations of one variable.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Angle Problems</b>                | In this Instruction Module, students will learn to solve angle problems using equations of one variable.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.     |

## Additional Resources

### Math in the Real-world Videos

#### Video Game Designer

Designing a video game is all about math. Everything you see in a video game is based on a mathematical calculation. Word problems make the connection between math computations and real-world situations.

#### Pyro technician

This pyro technician explains how the beautiful fireworks displays you have seen rely on mathematical equations in order to create a beautiful display of fire and sound.

#### Firefighters

These firefighters use various numerical and algebraic expressions and equations in their jobs.

### Interactivities

#### Put Out the Fire

In this interactivity, students will apply their understanding of expressions and equations involving exponents and parentheses; they will find the volume of a water tank on a fire truck and determine friction loss in a fire hose using formulas.

### Manipulatives

|                                    |   |
|------------------------------------|---|
| <b>Algebra Tiles Manipulatives</b> | This manipulative includes tiles that represent +1 and -1, +x and -x, and +x <sup>2</sup> and -x <sup>2</sup> that students can drag to a workspace to model multiplication of monomials and polynomials.   |
| <b>Number Line Manipulatives</b>   | This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals. |
| <b>Activities</b>                  |   |
| <b>Firefighter</b>                 | In this activity, students will practice working with and evaluating expressions for given values of the variables under the context of water-tank volume and water flowing through a hose.   |
| <b>Quiz</b>                        |   |
| <b>7.11(A) Quiz</b>                | This quiz assesses students' understanding and ability to model and solve one-variable, two-step equations and inequalities.  |
| <b>7.11(B) Quiz</b>                | This quiz assesses students' understanding and ability to determine if the given value(s) make(s) one-variable, two-step equations and inequalities true.   |
| <b>7.11(C) Quiz</b>                | This quiz assesses students' understanding and ability to write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships.  |

## TEKS 7.12 (A, B, C) Measurement and data

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|--|--|
| <b>Topic: Analyzing and Describing Graphs</b>              | [TEKS 7.12 (A)] In this topic, students will learn to make comparisons using Box-and-Whisker Plots.  |
| <b>Instruction Module: Analyzing and Describing Graphs</b> | In this Instruction Module, students will learn to use box and whisker plots to compare two data sets. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Solving Statistics Problems</b>                  | [TEKS 7.12 (B) (C)] In this topic, students will learn to find the deviation from the Mean and Mean Absolute Deviation.  |
| <b>Instruction Module: Mean Absolute Deviation</b>         | In this Instruction Module, students will learn to calculate and use deviations from the mean as well as the mean absolute deviation. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |

## Additional Resources

**Math in the Real-world Videos**

**Wind Engineer** Wind Energy is one way to provide electrical power without creating carbon emissions. This engineer discusses the use of mathematics and especially algebra in her job. The designers use probability and statistics to analyze wind data so they can locate the turbines in the best place for optimal wind speeds.

**Water Quality Chemist** We take it for granted that our tap water is safe to drink, but we can be glad that water quality chemists are regularly sampling and testing the water to make sure that it is safe and meets all federal and state standards.

## Quiz

**7.12(A) Quiz** This quiz assesses students' understanding and ability to compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.

**7.12(B) Quiz** This quiz assesses students' understanding and ability to use data from a random sample to make inferences about a population.

**7.12(C) Quiz** This quiz assesses students' understanding and ability to compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations.

## TEKS 7.13 (A, B, C, D, E, F) Personal financial literacy

### Topic: Calculating Sales and Income Taxes

[TEKS 7.13 (A)] In this topic, students will learn to calculate sales taxes and income taxes.

### Lesson (Print): Calculating Sales and Income Taxes

In this lesson, students will learn to calculate sales taxes on purchases and income taxes on wages earned. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Topic: Constructing and Using a Budget

[TEKS 7.13 (B) © (D)] In this topic, students will learn to identify the components that comprise a personal budget.

### Lesson (Print): Constructing and Using a Budget

In this lesson, students will learn to identify the components that comprise a personal budget, calculate the percentage of a total budget each budgeting category comprises and construct a circle graph to represent a budget, create a budget ledger to show assets, liabilities, and net worth, and estimate income needed to meet basic budget needs. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

|   |   |
|---|---|
| <b>Topic: Calculating Interest</b>              | [TEKS 7.13 (E)] In this topic, students will learn to calculate simple and compound interest, and compare earnings from simple and compound interest.   |
| <b>Lesson (Print):<br/>Calculating Interest</b> | In this lesson, student will learn to calculate simple and compound interest, and compare earnings from simple and compound interest.<br>The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |

|  |   |
|--|---|
| <b>Topic: Monetary Incentives</b>              | [TEKS 7.13 (F)] In this topic, students will learn about rebates, sales, and coupons.   |
| <b>Lesson (Print):<br/>Monetary Incentives</b> | In this lesson, students will learn to analyze and compare rebates, sales, and coupons.<br>The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |

## Additional Resources

| Videos                                 |   |
|--|---|
| <b>Saving Money</b>                    | In this video, James Langford of FES talks about making money and the importance of saving money.   |
| <b>Banking I</b>                       | In this video, James Langford of FES introduces students to banking.  |
| <b>Debt</b>                            | This video, featuring James Langford of FES, gives students an understanding of taking loans and getting into debt.                               |
| <b>Investing</b>                       | In this video, James Langford of FES discusses investments and assets.  |
| <b>Stocks, Bonds, and Mutual Funds</b> | In this video, James Langford of FES introduces students to stocks, bonds, and mutual funds.  |
| <b>What Is Wealth?</b>                 | In this video, James Langford of FES examines the question "What is Wealth?"  |
| <b>Budgeting</b>                       | In this video, James Langford of FES talks about the importance of budgeting.   |
| <b>Banking II</b>                      | In this video, James Langford of FES discusses the various kinds of accounts that can be opened in a bank.  |
| <b>Credit Cards</b>                    | In this video, James Langford of FES discusses about credit card loans.   |
| <b>Careers</b>                         | In this video, James Langford of FES talks about income and careers.  |
| Quiz                                   |   |
| <b>7.13(A) Quiz</b>                    | This quiz assesses students' understanding and ability to calculate the sales tax for a given purchase and calculate income tax for earned wages. |
| <b>7.13(B) Quiz</b>                    | This quiz assesses students' understanding and ability to identify  |



|                     |   |
|---------------------|---|
|                     | the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget.                       |
| <b>7.13(C) Quiz</b> | This quiz assesses students' understanding and ability to create and organize a financial asset and liabilities record and construct a net worth statement.   |
| <b>7.13(D) Quiz</b> | This quiz assesses students' understanding and ability to use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student's city or another large city nearby. |
| <b>7.13(E) Quiz</b> | This quiz assesses students' understanding and ability to calculate and compare simple interest and compound interest earnings.   |
| <b>7.13(F) Quiz</b> | This quiz assesses students' understanding and ability to analyze and compare monetary incentives, including sales, rebates, and coupons.   |

## Grade 8 Course Description

### TEKS 8.2 (A, B, C, D) Number and operations

|  |   |
|--|---|
| <b>Topic: Define and Diagram Sets of Real Numbers</b>                  | [TEKS 8.2 (A) (B)] In this topic, students will learn to use Venn diagrams to show set relationships and describe sets of numbers.  |
| <b>Instruction Module: Define and Diagram Sets of Rational Numbers</b> | In this Instruction Module, students will learn to define and diagram sets of rational numbers.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Irrational and Real Number Sets</b>             | In this Instruction Module, students will learn to define and diagram the irrational and real number sets and locate real numbers approximately on the number line.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Topic: Scientific Notation</b>                                      | [TEKS 8.2 (C)] In this topic, students will learn to write numbers in scientific notation, and convert between scientific notation and standard notation.   |
| <b>Instruction Module: Powers of Ten with Integer Exponents</b>        | In this Instruction Module, students will learn to convert between the exponential and standard forms of powers of 10.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Multiplying by Exponential Powers of Ten</b>    | In this Instruction Module, students will learn to find the product of a number and a power of ten with an integer exponent.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Scientific Notation</b>                         | In this Instruction Module, students will learn to recognize whether or not a number is written in scientific notation.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Converting Standard and Scientific Notation</b> | In this Instruction Module, students will learn to convert between standard and scientific notation.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Approximating Irrational Numbers</b>                         | [TEKS 8.2 (B)] In this topic, students will learn to approximate the value of an irrational number to the hundredths place.   |
| <b>Lesson (Print): Approximating</b>                                   | In this lesson, students will approximate the value of an irrational number to the hundredths place without the use of a calculator in  |

**Irrational Numbers** the context of solving a mystery and will locate the value of the irrational number along a number line.  
The Lesson is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Ordering Real Numbers** [TEKS 8.2 (D)] In this topic, students will learn to order a set of real numbers.

**Lesson (Print): Ordering Real Numbers** In this lesson, students will learn to order a set of real numbers arising from mathematical and real world context.  
The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

#### Astronomer

This astronomer explains how math skills are needed in order to plot the movements of asteroids and compare those movements to the orbit of the earth and sun. Using these skills, she can determine the likelihood of a collision. Scientific notation is an important tool in her profession.

### Manipulatives

#### Number Line Manipulatives

This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.

#### Place Value Manipulatives

This manipulative includes place value charts for whole numbers and decimals. Students can use the charts to compare, order, add, subtract, multiply, or divide whole numbers or decimals.

### Quiz

#### 8.2(A) Quiz

This quiz assesses students' understanding and ability to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers.

#### 8.2(B) Quiz

This quiz assesses students' understanding and ability to approximate the value of an irrational number, including  $\pi$  and square roots of numbers less than 225, and locate that rational number approximation on a number line.

#### 8.2(C) Quiz

This quiz assesses students' understanding and ability to convert between standard decimal notation and scientific notation.

#### 8.2(D) Quiz

This quiz assesses students' understanding and ability to order a set of real numbers arising from mathematical and real-world contexts.

| TEKS 8.3 (A, B, C) Proportionality                         |   |
|--|---|
| <b>Topic: Similar Triangles</b>                            | [TEKS 8.3 (A)] In this topic, students will learn to develop and use the properties of similar triangles (ratio of sides and congruent angles) to solve problems involving similar triangles.   |
| <b>Instruction Module: Determining Congruent Triangles</b> | In this Instruction Module, students will learn to determine if two triangles are congruent.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Similar Triangles</b>               | In this Instruction Module, students will learn to define similar triangles and the AA and SSS similarity rules for triangles.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Similar Polygons</b>                             | [TEKS 8.3 (A)] In this topic, students will learn to identify similar figures, explore and develop the properties of similar figures (ratio of sides and congruent angles), and apply proportional reasoning to solve problems involving congruent or similar shapes. |
| <b>Instruction Module: Similar Polygons</b>                | In this Instruction Module, students will learn to identify characteristics of similar polygons.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Finding Unknown Lengths</b>         | In this Instruction Module, students will learn to use proportions to find lengths of unknown sides in similar polygons.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Enlargements and Reductions</b>     | In this Instruction Module, students will learn of the different properties of similar figures, including the ideas of ratio of sides and congruent angles.   |
| <b>Instruction Module: Scale Drawings</b>                  | In this Instruction Module, students will learn to create scale drawings.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Dilations</b>                                    | [TEKS 8.3 (C)] In this topic, students will learn to describe and use dilations (enlargements and reductions) of two-dimensional figures, and graph them on the coordinate plane.   |
| <b>Instruction Module: Dilations and Scale Factor</b>      | In this Instruction Module, students will learn to define and use dilations, scale factors, enlargements and reductions.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |



|  |  |
|--|--|
| <b>Instruction Module:<br/>Dilations on the<br/>Coordinate Plane</b> | <p>In this Instruction Module, students will learn to graph dilations that happen on the coordinate plane.</p> <p>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
|--|--|

|   |  |
|---|--|
| <b>Topic: Dilations and Their Effects</b> | <p>[TEKS 8.3 (B)] In this topic, students will understand how dilations represent similarity, and recognize how dilations change the area and perimeter of a figure.</p> |
|---|--|

|  |   |
|--|---|
| <b>Lesson (Print):<br/>Dilations and Their Effects</b> | <p>In this lesson, students will understand how dilations represent similarity by comparing and contrasting the attributes of a shape both before and after the shape is dilated and recognize how dilations change the area and perimeter of a figure.</p> <p>The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p> |
|--|---|

## Additional Resources

### Math in the Real-world Videos

|                 |  |
|-----------------|--|
| <b>Animator</b> | <p>Creating 3-D characters for film and television is an exciting job which involves the understanding of both two-dimensional and three-dimensional shapes.</p> |
|-----------------|--|

|                             |   |
|-----------------------------|---|
| <b>Stained Glass Artist</b> | <p>This stained glass artist uses his understanding of transformation of geometric shapes to help him make beautiful stained glass art.</p> |
|-----------------------------|---|

### Quiz

|                    |   |
|--------------------|---|
| <b>8.3(A) Quiz</b> | <p>This quiz assesses students' understanding and ability to generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation.</p> |
|--------------------|---|

|                    |  |
|--------------------|--|
| <b>8.3(B) Quiz</b> | <p>This quiz assesses students' understanding and ability to compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane.</p> |
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| <b>8.3(C) Quiz</b> | <p>This quiz assesses students' understanding and ability to use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation.</p> |
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### TEKS 8.4 (A, B, C) Proportionality

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|---|---|
| <b>Topic: Finding Slope</b>   | [TEKS 8.4 (A) (C)] In this topic, students will learn to find slope using the rise to run and the slope formula.  |
| <b>Instruction Module: Finding Slope</b>                                  | In this Instruction Module, students will learn to use rise to run and the slope formula to find slope.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.   |
| <b>Instruction Module: Finding Slope of Horizontal and Vertical Lines</b> | In this Instruction Module, students will learn to find the slope of horizontal, vertical, parallel, and perpendicular lines.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Writing Equations of Lines— Slope-Intercept</b>                 | [TEKS 8.4 (C)] In this topic, students will learn to write equations of lines given a graph or given the slope and y-Intercept.   |
| <b>Instruction Module: Writing the Equation of a Line from Graphs</b>     | In this Instruction Module, students will learn to write the equation of a line when given a graph.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Translations and Reflections</b>                                | [TEKS 8.4 (C)] In this topic, students will learn to perform translations and reflections of two-dimensional figures, and describe the results.   |
| <b>Instruction Module: Translations</b>                                   | In this Instruction Module, students will understand and use translations.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Reflections</b>                                    | In this Instruction Module, students will understand and use reflections.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Proportional and Non-Proportional Relationships</b>             | [TEKS 8.4 (B) (C)] In this topic, students will compare and contrast situations, graphs, equations, and tables that represent proportional and non-proportional relationships.  |
| <b>Lesson (Print): Proportional and Non-Proportional Relationships</b>    | In this lesson, students will compare and contrast situations, graphs, equations, and tables that represent proportional and non-proportional relationships and learn to generalize the rules of proportionality, connect the rate of change in a table to the slope of the graph, and determine slopes/rates of change and y-intercepts using graphs and tables.<br>The Lesson is supported by Student Notes, Teacher Notes, and Independent Practice. |

## Additional Resources

### Math in the Real-world Videos

|                                 |   |
|---------------------------------|---|
| <b>Performance Car Designer</b> | Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance. |
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| <b>Thrill Ride Engineer</b> | Those exciting theme park thrill rides can only be designed and built by people with knowledge of mathematics. This thrill ride engineer explains how mathematical calculations including slope are needed in designing safe and exciting thrill rides. |
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### Interactivities

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| <b>Triathlon</b> | In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units. |
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| <b>Gas Station</b> | In this interactivity, students will apply their understanding of proportional relationships. They will recognize the proportional relationship between the values on a gas pump display (the unit rate, the quantity of gas purchased, and the total cost) to find one of the values when the other two are known. |
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### Quiz

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| <b>8.4(A) Quiz</b> | This quiz assesses students' understanding and ability to use similar right triangles to develop an understanding that slope, $m$ , given as the rate comparing the change in $y$ -values to the change in $x$ -values, $(y_2 - y_1) / (x_2 - x_1)$ , is the same for any two points $(x_1, y_1)$ and $(x_2, y_2)$ on the same line. |
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| <b>8.4(B) Quiz</b> | This quiz assesses students' understanding and ability to graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship. |
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| <b>8.4(C) Quiz</b> | This quiz assesses students' understanding and ability to use data from a table or graph to determine the rate of change or slope and $y$ -intercept in mathematical and real-world problems. |
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### TEKS 8.5 (A, B, C, D, E, F, G, H, I) Proportionality

#### Topic: Graphing Linear Equations of Two Variables

[TEKS 8.5 (B)] In this topic, students will learn to graph linear equations of two variables.

#### Instruction Module: Graphing Linear Equations of Two Variables-I

In this Instruction Module, students will learn to graph linear equations from a data table, and graph linear equations using the intercept method.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Graphing Linear Equations of Two Variables-II

In this Instruction Module, students will learn to graph linear equations of two variables using the slope-intercept method.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Topic: Writing Equations of Lines— Topic: Slope-Intercept

[TEKS 8.5 (B) (I)] In this topic, students will learn to write equations of lines given a graph or given the slope and y-Intercept.

#### Instruction Module: Writing the Equation of a Line from Graphs

In this Instruction Module, students will learn to write the equation of a line when given a graph.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Writing Equations of Lines -Slope-Intercept

In this Instruction Module, students will learn to write the slope-intercept form of the linear equation given the slope and the y-intercept.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Parallel and Perpendicular Line Equations

In this Instruction Module, students will learn to write the equations of lines parallel and perpendicular to given lines.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Topic: Defining Relations and Functions

[TEKS 8.5 (G)] In this topic, students will learn to find the range and domain of a relation and ways to represent relations, and determine whether a relation is a function.

#### Instruction Module: Finding the Domain and Range of Relations

In this Instruction Module, students will learn to find the range and domain of a relation and ways to represent relations.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

#### Instruction Module: Functions

In this Instruction Module, students will learn to determine whether a relation is a function.  
The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

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| <b>Topic: Writing Functions from Patterns</b>                           | [TEKS 8.5 (I)] In this topic, students will learn to write a function for linear and non-linear patterns.   |
| <b>Instruction Module: Writing a Function Rule for a Linear Pattern</b> | In this Instruction Module, students will learn to write a function rule for a linear pattern.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Writing a Function Rule Non-Linear Pattern</b>   | In this Instruction Module, students will learn to write a function rule for a non-linear pattern.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Solving Problems Using Functions</b>                          | [TEKS 8.5 (I)] In this topic, students will learn to solve real-world problems using functions.   |
| <b>Instruction Module: Solving Problems Using Functions</b>             | In this Instruction Module, students will learn to solve problems using functions.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Writing Linear Functions from Two Points</b>     | In this Instruction Module, students will learn to write linear functions from two points.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Solving Problems Using Direct Variation</b>                   | [TEKS 8.5 (A) (E) (F)] In this topic, students will learn to determine whether a function is a direct variation, identify the constant of variation, and solve problems using direct variation.                                 |
| <b>Instruction Module: Direct Variation</b>                             | In this Instruction Module, students will learn to determine whether a function is a direct variation and identify the constant of variation.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Using Direct Variation to Solve Problems</b>     | In this Instruction Module, students will learn to solve problems using direct variation.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Topic: Finding a Line of Fit</b>                                     | [TEKS 8.5 (D)] In this topic, students will learn to construct and interpret scatter plots, and find the line of best fit.  |
| <b>Instruction Module: Drawing and Interpreting Scatterplots</b>        | In this Instruction Module, students will learn to draw and interpret scatterplots.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |

**Instruction Module:**  
**Finding a Line of Fit**

In this Instruction Module, students, when given a line of fit for a data set, will learn to write equations and make predictions using that line.

The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Linear vs. Nonlinear Data**

[TEKS 8.5 (C)] In this topic, students will compare and determine characteristics of data that represent linear and nonlinear relationships.

**Lesson (Print):**  
**Linear vs. Nonlinear Data**

In this lesson, students will learn to compare bivariate data sets in order to determine characteristics of data that represent linear relationships compared to those that do not represent linear relationships.

The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Proportional and Non-Proportional Relationships**

[TEKS 8.5 (A) (B) (F) (H)] In this topic, students will compare and contrast situations, graphs, equations, and tables that represent proportional and non-proportional relationships.

**Lesson (Print):**  
**Proportional and Non-Proportional Relationships**

In this lesson, students will compare and contrast situations, graphs, equations, and tables that represent proportional and non-proportional relationships and learn to generalize the rules of proportionality, connect the rate of change in a table to the slope of the graph, and determine slopes/rates of change and y-intercepts using graphs and tables.

The Lesson is supported by Student Notes, Teacher Notes, and Independent Practice.

## Additional Resources

### Math in the Real-world Videos

**Stockbroker**

This financial executive uses equations to make decisions about buying and selling stocks. Creating an equation based on expected increase in value per year allows her to determine if the stock is performing better or worse than her expectations.

**Water Quality Chemist**

We take it for granted that our tap water is safe to drink, but we can be glad that water quality chemists are regularly sampling and testing the water to make sure that it is safe and meets all federal and state standards. By creating trend lines of data, they can predict if a problem is developing on the quality of the water.

**Performance Car Designer**

Developing a high performance automobile involves a multitude of variables and dependent relationships such as the relationship between the speed of the engine and the speed of the vehicle. The designer must analyze these relationships to build for optimum performance.

|                                   |   |
|-----------------------------------|---|
| <b>Triathlete</b>                 | This triathlete talks about how important it is to understand rates, unit rates, and conversion of measurement units in training for a triathlon.   |
|                                   | <b>Interactivities</b>  |
| <b>Triathlon</b>                  | In this interactivity, students will apply their understanding of ratio and rate reasoning to solve problems set in a situation in which two teenagers are training for a triathlon. They will use a table to plot the pairs of values on the coordinate plane. They will also use ratio reasoning to convert measurement units.                              |
| <b>Performance Cars Variables</b> | In this interactivity, students will use equations, tables, and graphs to represent and analyze the relationships between independent and dependent variables; the situations include motion at a constant speed and the relationship between distance and time, and the relationship between engine speed and vehicle speed at four different forward gears. |
|                                   | <b>Activities</b>   |
| <b>Triathlon</b>                  | In this Activity, students will practice identifying proportional relationships and calculating rates of change in the context of triathlon events.   |
|                                   | <b>Quiz</b>   |
| <b>8.5(A) Quiz</b>                | This quiz assesses students' understanding and ability to represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$ .   |
| <b>8.5(B) Quiz</b>                | This quiz assesses students' understanding and ability to represent linear non-proportional situations with tables, graphs, and equations in the form of $y = mx + b$ , where $b \neq 0$ .  |
| <b>8.5(C) Quiz</b>                | This quiz assesses students' understanding and ability to contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation.   |
| <b>8.5(D) Quiz</b>                | This quiz assesses students' understanding and ability to use a trend line that approximates the linear relationship between bivariate sets of data to make predictions.  |
| <b>8.5(E) Quiz</b>                | This quiz assesses students' understanding and ability to solve problems involving direct variation.  |
| <b>8.5(F) Quiz</b>                | This quiz assesses students' understanding and ability to distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$ , where $b \neq 0$ .  |

## 8.5(G) Quiz

This quiz assesses students' understanding and ability to identify functions using sets of ordered pairs, tables, mappings, and graphs.

## 8.5(H) Quiz

This quiz assesses students' understanding and ability to identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems.

## 8.5(I) Quiz

This quiz assesses students' understanding and ability to write an equation in the form  $y = mx + b$  to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.

## TEKS 8.6 (A, B, C) Expressions, equations, and relationships

### Topic: Right Triangles

[TEKS 8.6(C)] In this topic, students will learn to use the Pythagorean Theorem to solve problems, and use the converse of the theorem to determine if a triangle is a right triangle.

### Instruction Module: The Pythagorean Theorem

In this Instruction Module, students will learn to use the Pythagorean Theorem to solve problems. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

### Instruction Module: The Converse of the Pythagorean Theorem

In this Instruction Module, students will learn to use the converse of the Pythagorean Theorem to determine if a triangle is a right triangle. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Volume: Cylinders and Spheres

[TEKS 8.6(A)] In this topic, students will learn to solve problems using the volume formulas for cylinders and spheres.

### Instruction Module: Volume of a Cylinder and Sphere

In this Instruction Module, students will learn to solve problems using the volume formulas for cylinders and spheres. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

### Topic: Volume: Cones

[TEKS 8.6(B)] In this topic, students will learn to solve problems using the volume formula for cones.



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| <b>Instruction Module:<br/>Volume of a Cone</b> | In this Instruction Module, students will learn to solve problems using the volume formula for cones. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
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| <b>Topic: Volumes of Cylinders and Cones</b> | [TEKS 8.6(A) (B)] In this topic, students will learn to describe the volume formulas of a solid, including a prism, cylinder, pyramid, and cone, and determine the proportional relationship between the volumes of cylinders and cones having like base radius and height. |
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| <b>Lesson (Print):<br/>Volumes of Cylinders and Cones</b> | In this lesson, students will learn to describe the volume of a solid, including a prism, cylinder, pyramid, and cone, in terms of its base area and height, examine and determine the proportional relationship between the volumes of cylinders and cones having like base radius and height, and compare that to the volume relationship between pyramids and prisms. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
|---|---|

## Additional Resources

### Math in the Real-world Videos

|                                  |  |
|----------------------------------|--|
| <b>Construction Site Manager</b> | Calculating volumes is an important part of managing a construction site. Cylinders and cones are used for concrete foundations. Concrete spheres are used in some projects to create attractive barricades. |
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| <b>Criminologist</b> | This crime scene investigator relies on math and science skills to reconstruct what occurred at a crime scene. Although more advanced trigonometry is used for blood stain pattern analysis, the foundation for those skills is the Pythagorean theorem. |
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| <b>Baseball Stadium Groundskeeper</b> | The Groundskeeper for Dodger Stadium shows that math skills are important to his job. He must use his math skills to calculate the volume of right rectangular prism to determine the topsoil needed to redo the infield, and the Pythagorean Theorem helps him ensure that all the bases are properly located. |
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### Interactivities

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| <b>Proving the Pythagorean Theorem</b> | In this interactivity, students will prove the Pythagorean Theorem and its converse using rearrangement of geometric shapes, triangle sum property, and congruency of triangles. |
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| <b>Volume of Cylinders, Cones, and Spheres</b> | In this interactivity, students will use the formulas for the volumes of cones, cylinders, and spheres to solve real-world problems that may arise at a large construction site. |
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|                                      | <b>Problem Solving</b>   |
|--------------------------------------|--|
| <b>Pythagorean Theorem</b>           | This item guides students through the processes of solving real-world and mathematical problems. Students will apply the Pythagorean Theorem to determine an unknown side length in a right triangle to solve a problem. |
|                                      | <b>Activities</b>  |
| <b>Cylinders, Cones, and Spheres</b> | In this activity, students will practice calculating the volumes of cylinders, cones, and spheres under the context of construction materials.   |
|                                      | <b>Quiz</b>  |
| <b>8.6(A) Quiz</b>                   | This quiz assesses students' understanding and ability to describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height.   |
| <b>8.6(B) Quiz</b>                   | This quiz assesses students' understanding and ability to model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas.      |
| <b>8.6(C) Quiz</b>                   | This quiz assesses students' understanding and ability to use models and diagrams to explain the Pythagorean theorem.  |

## TEKS 8.7 (A, B, C, D) Expressions, equations, and relationships

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| <b>Topic: Right Triangles</b>                                      | [TEKS 8.7 (C)] In this topic, students will learn to use the Pythagorean Theorem to solve problems, and use the converse of the theorem to determine if a triangle is a right triangle.  |
| <b>Instruction Module: The Pythagorean Theorem</b>                 | In this Instruction Module, students will learn to use the Pythagorean Theorem to solve problems.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.                          |
| <b>Instruction Module: The Converse of the Pythagorean Theorem</b> | In this Instruction Module, students will learn to use the converse of the Pythagorean Theorem to determine if a triangle is a right triangle.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |

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| <b>Topic: Distances on a Coordinate Plane</b>              | <p>[TEKS 8.7 (D)] In this topic, students will learn to use coordinate geometry to find lengths of segments and distance between points and perpendicular-parallel lines.</p>   |
| <b>Instruction Module: Distances on a Coordinate Plane</b> | <p>In this Instruction Module, students will learn to find the distance between two Points on a coordinate plane. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                  |
| <b>Topic: Surface Area: Prisms, Cylinders, and Spheres</b> | <p>[TEKS 8.7 (B)] In this topic, students will learn to derive and use formulas for surface area of prisms, cylinder, and spheres, and use the correct units.</p>   |
| <b>Instruction Module: Surface Area of a Prism</b>         | <p>In this Instruction Module, students will learn to solve problems involving the surface area of prisms. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                         |
| <b>Instruction Module: Surface Area of a Cylinder</b>      | <p>In this Instruction Module, students will learn to use square units to find the surface area of a cylinder. The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p> |
| <b>Instruction Module: Surface Area of a Sphere</b>        | <p>In this Instruction Module, students will learn to use square units to find the surface area of a sphere. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                       |
| <b>Topic: Volume of a Cylinder and a Sphere</b>            | <p>[TEKS 8.7 (A)] In this topic, students will learn to solve problems using the volume formulas for cylinders and spheres.</p>   |
| <b>Instruction Module: Volume of a Cylinder and Sphere</b> | <p>In this Instruction Module, students will learn to solve problems using the volume formulas for cylinders and spheres.</p>   |
| <b>Topic: Surface Area: Pyramids and Cones</b>             | <p>[TEKS 8.7 (B)] In this topic, students learn to derive and use formulas for surface area of pyramids and cones, and use correct units.</p>   |
| <b>Instruction Module: Surface Area of Pyramids</b>        | <p>In this Instruction Module, students will learn to use formulas and square units to find the surface area of pyramids. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>          |
| <b>Instruction Module: Surface Areas of Cones</b>          | <p>In this Instruction Module, students will learn to use formulas and square units to find the surface areas of cones. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>            |
| <b>Topic: Volume: Cones</b>                                | <p>[TEKS 8.7 (A)] In this topic, students will learn to solve problems using the volume formula for cones.</p>  |

**Instruction Module:  
Volume of a Cone**

In this Instruction Module, students will learn to solve problems using the volume formula for cones. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

**Topic: Volumes of  
Cylinders and Cones**

[TEKS 8.7 (A)] In this topic, students will learn to describe the volume formulas of a solid, including a prism, cylinder, pyramid, and cone, and determine the proportional relationship between the volumes of cylinders and cones having like base radius and height.

**Lesson (Print):  
Volumes of  
Cylinders and Cones**

In this lesson, students will learn to describe the volume of a solid, including a prism, cylinder, pyramid, and cone, in terms of its base area and height, examine and determine the proportional relationship between the volumes of cylinders and cones having like base radius and height, and compare that to the volume relationship between pyramids and prisms. The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Construction Site  
Manager**

Calculating volumes is an important part of managing a construction site. Cylinders and cones are used for concrete foundations. Concrete spheres are used in some projects to create attractive barricades.

**Baseball Stadium  
Groundskeeper**

The Groundskeeper for Dodger Stadium shows that math skills are important to his job. He must use his math skills to calculate the volume of right rectangular prism to determine the topsoil needed to redo the infield, and the Pythagorean Theorem helps him ensure that all the bases are properly located.

### Interactivities

**Proving the  
Pythagorean  
Theorem**

In this interactivity, students will prove the Pythagorean Theorem and its converse using rearrangement of geometric shapes, triangle sum property, and congruency of triangles.

**Volume of Cylinders,  
Cones, and Spheres**

In this interactivity, students will use the formulas for the volumes of cones, cylinders, and spheres to solve real-world problems that may arise at a large construction site.

### Problem Solving

**Pythagorean  
Theorem**

This item guides students through the processes of solving real-world and mathematical problems. Students will apply the Pythagorean Theorem to determine an unknown side length in a right triangle to solve a problem.

|                                      | Activities   |
|--------------------------------------|--|
| <b>Cylinders, Cones, and Spheres</b> | In this activity students will practice calculating the volumes of Cylinders, Cones, and Spheres under the context of construction materials.  |
| <b>Pythagorean Theorem</b>           | In this activity, students will prove the Pythagorean theorem and its converse and apply their understanding to solve problems involving triangles and quadrilaterals.   |
| Quiz                                 |  |
| <b>8.7(A) Quiz</b>                   | This quiz assesses students' understanding and ability to solve problems involving the volume of cylinders, cones, and spheres.  |
| <b>8.7(B) Quiz</b>                   | This quiz assesses students' understanding and ability to use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders. |
| <b>8.7(C) Quiz</b>                   | This quiz assesses students' understanding and ability to use the Pythagorean Theorem and its converse to solve problems.  |
| <b>8.7(D) Quiz</b>                   | This quiz assesses students' understanding and ability to determine the distance between two points on a coordinate plane using the Pythagorean Theorem.   |

## TEKS 8.8 (A, B, C, D) Expressions, equations, and relationships

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| <b>Topic: Solving Multi-Step Linear Equations</b>                 | [TEKS 8.8 (C)] In this topic, students will learn to solve multi-step linear equations and model it using algebra tiles.   |
| <b>Instruction Module: Solving Multi-step Linear Equations-I</b>  | In this Instruction Module, students will learn to solve multi-step linear equations with variables on both sides of the equation. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.                                  |
| <b>Instruction Module: Solving Multi-step Linear Equations-II</b> | In this Instruction Module, students will learn to solve multi-step equations using the Distributive Property and solve multi-step equations with rational numbers. The IM is supported by Student Notes, Teacher Notes, and Independent Practice. |
| <b>Instruction Module: Solve Equations Using Algebra Tiles</b>    | In this Instruction Module, students will learn to use algebra tiles to solve linear equations. The IM is supported by Student Notes and Teacher Notes.  |
| <b>Topic: Rewriting Formulas</b>                                  | [TEKS 8.8 (A)] In this topic, students will learn to rewrite formulas, including area and dimension formulas, in order to isolate the desired variable.  |

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| <p><b>Instruction Module:<br/>Area and Dimension<br/>Formulas</b></p>                      | <p>In this Instruction Module, students will learn to rewrite formulas so as to find one of the variables in area and dimension formulas. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>               |
| <p><b>Instruction Module:<br/>Isolating the Desired<br/>Variable in a<br/>Formula</b></p>  | <p>In this Instruction Module, students will learn to rewrite various formulas so as to find the variables. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Topic: Solving<br/>Consumer Business<br/>Problems</b></p>                            | <p>[TEKS 8.8 (A) (B)] In this topic, students will learn to solve Consumer/Business problems using equations of one variable.</p>  |
| <p><b>Instruction Module:<br/>Problem Solving<br/>with Integers</b></p>                    | <p>In this Instruction Module, students will learn to make a plan to solve consumer business problems with integers using equations of one variable. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>    |
| <p><b>Instruction Module:<br/>Problem Solving<br/>with Percents</b></p>                    | <p>In this Instruction Module, students will learn to make a plan to solve consumer business problems with percentages using equations of one variable. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <p><b>Topic: Solving Multi-<br/>Step Linear<br/>Inequalities</b></p>                       | <p>[TEKS 8.8 (A) (C)] In this topic, students will learn to solve multi-step inequalities involving simplifying expressions.</p>   |
| <p><b>Instruction Module:<br/>Inequalities with<br/>Variables on Both<br/>Sides</b></p>    | <p>In this Instruction Module, students will learn to solve and graph inequalities with variable on both sides. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <p><b>Instruction Module:<br/>Inequalities Using<br/>the Distributive<br/>Property</b></p> | <p>In this Instruction Module, students will learn to solve and graph inequalities using the distributive property. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                                     |
| <p><b>Topic: Problems<br/>Using Inequalities of<br/>One Variable</b></p>                   | <p>[TEKS 8.8 (A)] In this topic, students will learn to solve problems using inequalities of one variable.</p>   |
| <p><b>Instruction Module:<br/>Solving Problems<br/>with Inequalities</b></p>               | <p>In this Instruction Module, students will learn to write and solve inequalities of one variable so as to solve problems. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                             |

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| <b>Topic: Angle Relationships and Parallel Lines</b>           | <p>[TEKS 8.8 (A) (D)] In this topic, students will learn to recognize the pairs of angles formed and the relationship between the angles including two intersecting lines and parallel lines cut by a transversal.</p>        |
| <b>Instruction Module: Angle Relationships</b>                 | <p>In this Instruction Module, students will understand and identify complementary and supplementary angles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>                               |
| <b>Instruction Module: Intersecting Lines and Transversals</b> | <p>In this Instruction Module, students will understand and identify vertical angles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <b>Instruction Module: Parallel Lines and Transversals</b>     | <p>In this Instruction Module, students will learn to solve angle measure problems with vertical angles, parallel lines, and transversals. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p> |
| <b>Topic: Triangles</b>  | <p>[TEKS 8.8 (D)] In this topic, students will learn to identify, describe, draw, and classify triangles, and determine the sum of the measures of interior angles of triangles.</p>  |
| <b>Instruction Module: Defining Triangles</b>                  | <p>In this Instruction Module, students will learn to define and name triangles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Instruction Module: Classifying Triangles</b>               | <p>In this Instruction Module, students will learn to classify and sketch triangles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Instruction Module: Triangle Sum Property</b>               | <p>In this Instruction Module, student will learn to define and use the triangle sum property. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>   |
| <b>Topic: Similar Triangles</b>                                | <p>[TEKS 8.8 (D)] In this topic, students will learn to use the angle-angle criterion to determine if triangles are similar.</p>  |
| <b>Instruction Module: Similar Triangles</b>                   | <p>In this Instruction Module, students will learn to define similar figures and the AA and SSS Similarity Rules for triangles. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>            |
| <b>Topic: One Variable Equations and Inequalities</b>          | <p>[TEKS 8.8 (B) (C)] In this topic, students will learn to interpret a real-world problem, write a one variable equation or inequality to represent the situation, and find the solution.</p>                                |

**Lesson (Print): One Variable Equations and Inequalities**

In this lesson, students will learn to interpret a real-world problem and write a one variable equation or inequality to represent the situation, use one-variable equations to model solution processes for real-world problems, solve the equations, relate mathematical solutions to the application problem, and write a real-world problem that would best be represented by a given equation or a given inequality statement.

The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

**Topic: Angle Relationships**

[TEKS 8.8 (D)] In this topic, students will discover and learn facts about angle relationships in parallel lines when cut by a transversal and angle properties of triangles, and use the angle-angle criterion for determining similarity in triangles.

**Lesson (Print): Angle Relationships**

In this lesson, students will discover and learn facts about angle relationships in parallel lines when cut by a transversal and use informal arguments to describe and relate them to angle properties of triangles, discover facts about the angle-angle criterion for determining similarity in triangles and use informal arguments to describe them and relate them to angle properties of triangles.

The Lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.

## Additional Resources

### Math in the Real-world Videos

**Architect** This architect discusses how triangles and astronomy come together at the Griffith Observatory in Los Angeles, California.

**Firefighter** A firefighter needs math to determine what is needed to put out a fire. Evaluating expressions that arise from formulas is a vital part of the job. Two formulas a firefighter uses are the friction loss formula and the formula for the volume of right rectangular prism.

**Zookeeper** A zookeeper enjoys a great job dealing with animals all day. Math skills are vital for ordering the proper quantity of food based on animal weight, growth rates, and the number of feedings per year.

### Manipulatives

**Algebra Tiles Manipulatives** This manipulative includes tiles that represent +1 and -1, +x and -x, and +x<sup>2</sup> and -x<sup>2</sup> that students can drag to a workspace to model multiplication of monomials and polynomials.

**Number Line Manipulatives** This manipulative includes an integer number line, a fractions number line, and a decimal number line. Students can drag numbers and operators, and use the number lines to compare, order, graph, add, subtract, multiply, and divide integers, fractions, and decimals.





|                    | <b>Activities</b>  |
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| <b>Architect</b>   | In this activity, students will practice writing and solving one variable equations and inequalities with variables on both sides and use angle relationships to solve problems under the context of designing an observatory.   |
|                    | <b>Quiz</b>  |
| <b>8.8(A) Quiz</b> | This quiz assesses students' understanding and ability to write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants.  |
| <b>8.8(B) Quiz</b> | This quiz assesses students' understanding and ability to write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants.                                 |
| <b>8.8(C) Quiz</b> | This quiz assesses students' understanding and ability to model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants.                                |
| <b>8.8(D) Quiz</b> | This quiz assesses students' understanding and ability to use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. |

## TEKS 8.9 (A) Expressions, equations, and relationships

### Topic: Solving Systems of Linear Equations by Graphing

[TEKS 8.9 (A)] In this topic, students will learn to solve systems of linear equations by graphing.

### Instruction Module: Systems of Equations-Ordered Pair Solutions

In this Instruction Module, students will learn to determine whether a given ordered pair is a solution to a system of linear equations.  
The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

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| <b>Instruction Module:<br/>Systems of Linear<br/>Equations- Graphing</b> | In this Instruction Module, students will learn to solve two systems of linear equations by graphing.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
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## Additional Resources

### Math in the Real-world Videos

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| <b>Jet Fighter Pilot</b> | This jet fighter pilot discusses how mission planning and coordination involves solving equations. Before he ever gets in the cockpit, he uses his math skills to plan the mission. Missions must be coordinated with other aircraft and simultaneous equations are essential to mission planning. |
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### Interactivities

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| <b>Simultaneous Equations</b> | In this interactivity students will solve real-world problems involving the application and solution of simultaneous equations. They will identify the equations that correctly represent the given information, use them to create data tables, plot the data points, and find the solution to the pair of equations. |
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### Activities

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| <b>Jet Fighter-Simultaneous Equations</b> | Students will practice solving linear equations and solving systems of linear equations under the context of aircraft or vessel traveling at different speeds. |
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### Quiz

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| <b>8.9(A) Quiz</b> | This quiz assesses students' understanding and ability to identify and verify the values of $x$ and $y$ that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations. |
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## TEKS 8.10 (A, B, C, D) Two-dimensional shapes

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| <b>Topic: Translations and Reflections</b> | [TEKS 8.10 (A) (B) (C)] In this topic, students will learn to perform translations and reflections of two-dimensional figures, and describe the results. |
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| <b>Instruction Module:<br/>Translations</b> | In this Instruction Module, students will understand and use translations.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |
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| <b>Instruction Module: Reflections</b>                          | In this Instruction Module, students will understand and use reflections.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Rotations</b>   | [TEKS 8.10 (A) (C)] In this topic, students will learn to perform rotations of two-dimensional figures and describe the results.   |
| <b>Instruction Module: Rotations of Two-Dimensional Figures</b> | In this Instruction Module, students will understand and use rotations of two-dimensional figures.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.   |
| <b>Instruction Module: Rotations Using Ordered Pairs</b>        | In this Instruction Module, students will learn to use ordered pairs to perform rotations of two-dimensional figures.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Dilations</b>   | [TEKS 8.10 (A)] In this topic, students will learn to describe and use dilations (enlargements and reductions) of two-dimensional figures, and graph them on the coordinate plane.   |
| <b>Instruction Module: Dilations and Scale Factor</b>           | In this Instruction Module, students will learn to define and use dilations, scale factors, enlargements, and reductions.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Dilations on the Coordinate Plane</b>    | In this Instruction Module, students will learn to graph dilations on a coordinate plane.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Dilations and Their Effects</b>                       | [TEKS 8.10 (B) (D)] In this topic, students will understand how dilations represent similarity, and recognize how dilations change the area and perimeter of a figure.   |
| <b>Lesson (Print): Dilations and Their Effects</b>              | In this lesson, students will understand how dilations represent similarity by comparing and contrasting the attributes of a shape both before and after the shape is dilated and recognize how dilations change the area and perimeter of a figure.<br>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity. |

## Additional Resources

| <b>Math in the Real-world Videos</b> |  |
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| <b>Stained Glass Artist</b>          | This stained glass artist uses his understanding of transformation of geometric shapes to help him make beautiful stained glass art.   |
| <b>Quiz</b>                          |  |
| <b>8.10(A) Quiz</b>                  | This quiz assesses students' understanding and ability to generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes |



on a coordinate plane.

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| <b>8.10(B) Quiz</b> | This quiz assesses students' understanding and ability to differentiate between transformations that preserve congruence and those that do not.  |
| <b>8.10(C) Quiz</b> | This quiz assesses students' understanding and ability to explain the effect of translations, reflections over the x- or y-axis, and rotations limited to $90^\circ$ , $180^\circ$ , $270^\circ$ , and $360^\circ$ as applied to two-dimensional shapes on a coordinate plane using an algebraic representation. |
| <b>8.10(D) Quiz</b> | This quiz assesses students' understanding and ability to model the effect on linear and area measurements of dilated two-dimensional shapes.  |

## TEKS 8.11 (A, B, C) Measurement and data

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| <b>Topic: Finding a Line of Fit</b>                | [TEKS 8.11 (A)] In this topic, students will learn to construct and interpret scatter plots, and find the line of best fit.  |
| <b>Instruction Module: Scatter Plots</b>           | In this Instruction Module, students will learn to construct and interpret scatter plots.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Instruction Module: Lines of Fit</b>            | In this Instruction Module, students will learn to find the line of fit and use it to predict values.<br>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.  |
| <b>Topic: Solving Statistic Problems</b>           | [TEKS 8.11 (B)] In this topic, students will learn to find the deviation from the Mean and Mean Absolute Deviation.  |
| <b>Instruction Module: Mean Absolute Deviation</b> | In this Instruction Module, students will learn to calculate and use deviations from the mean as well as the mean absolute deviation.<br>The IM is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.                                |
| <b>Topic: Random Sampling</b>                      | [TEKS 8.11 (C)] In this topic, students will learn to use random sampling to generalize characteristics of the population.   |
| <b>Lesson (Print): Random Sampling</b>             | In this lesson, students will learn to use random sampling to simulate the preferences of a population and will generalize the characteristics of a random sample to the population.<br>The lesson is supported by Student Notes, Teacher Notes, and Independent Practice. |

**Additional Resources**

**Math in the Real-world Videos**

**Forestry Service**

A wildlife biologist and a forester discuss how sampling plays an important role in their jobs. The use of sampling is an important tool for them in estimating the population of deer or the growth rates of trees.

**Water Quality Chemist**

We take it for granted that our tap water is safe to drink, but we can be glad that water quality chemists are regularly sampling and testing the water to make sure that it is safe and meets all federal and state standards. By creating trend lines of data, they can predict if a problem is developing on the quality of the water.

**G.E. Wind Engineer**

Wind Energy is one way to provide electrical power without creating carbon emissions. This engineer discusses the use of mathematics and especially algebra in her job. The designers use probability and statistics to analyze wind data so they can locate the turbines in the best place for optimal wind speeds.

**Quiz**

**8.11(A) Quiz**

This quiz assesses students' understanding and ability to construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data.

**8.11(B) Quiz**

This quiz assesses students' understanding and ability to determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points.

**8.11(C) Quiz**

This quiz assesses students' understanding and ability to simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected.

**TEKS 8.12 (A, B, C, D, E, F, G) Personal financial literacy**

**Topic: Problem Solving with Percents**

[TEKS 8.12 (D)] In this topic, students will learn to solve real-world percent problems including percent of increase and decrease, and problems involving simple and compound interest.

**Instruction Module: Percent of Increase and Percent of Decrease**

In this Instruction Module, students will learn to solve real-world problems that involve percent increase and percent decrease. The IM is supported by Student Notes, Teacher Notes, and Independent Practice.

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| <p><b>Instruction Module:<br/>Simple Interest</b></p>                       | <p>In this Instruction Module, students will learn to solve real-world percent problems involving simple interest.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Instruction Module:<br/>Compound Interest</b></p>                     | <p>In this Instruction Module, students will learn to solve real-world percent problems involving compound interest.<br/>The IM is supported by Student Notes, Teacher Notes, and Independent Practice.</p>  |
| <p><b>Topic: The Hidden Costs of Credit and Loans</b></p>                   | <p>[TEKS 8.12 (A) (B) (F)] In this topic, students will learn to investigate credit and loan debt by comparing how interest rates, payment terms, and time affect the total cost.</p>  |
| <p><b>Lesson (Print): The Hidden Costs of Credit and Loans</b></p>          | <p>In this lesson, students will learn to investigate credit and loan debt by comparing how interest rates, payment terms, and time affect the total cost when using credit or loan debt to purchase, use online calculators, and calculate the total cost of repayment based on different interest rates and number of payments.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p> |
| <p><b>Topic: Investments and Savings – The Growth of Money</b></p>          | <p>[TEKS 8.12 (C) (D) (F)] In this topic, students will compare the growth of money calculated using both simple and compound interest rates.</p>  |
| <p><b>Lesson (Print): Investments and Savings – The Growth of Money</b></p> | <p>In this lesson, students will compare the growth of money calculated using both simple and compound interest rates, and learn how investments, including retirement and college savings plans, grow over time.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>   |
| <p><b>Topic: Funding Higher Education</b></p>                               | <p>[TEKS 8.12 (F) (G)] In this topic, students will explore ways to save to pay for a college education.</p>   |
| <p><b>Lesson (Print): Funding Higher Education</b></p>                      | <p>In this lesson, students will learn to estimate the costs associated with attending a two-or four-year college program of study, explore ways to save to pay for a college education, and devise a savings plan for funding at least one year of college.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>  |
| <p><b>Topic: Comparing Payment Methods</b></p>                              | <p>[TEKS 8.12 (E) (F)] In this topic, students will compare various methods of paying for purchases, and identify and explain the advantages and disadvantages of each.</p>  |
| <p><b>Lesson (Print): Comparing Payment Methods</b></p>                     | <p>In this lesson, students will compare various methods of paying for purchases, identify advantages and disadvantages of each, and explain the advantage or disadvantage to using a given payment method in terms of fiscal responsibility.<br/>The lesson is supported by Student Notes, Teacher Notes, Independent Practice, and a Student Activity.</p>   |

| Additional Resources                   |   |
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|  | <b>Videos</b>   |
| <b>Saving Money</b>                    | In this video, James Langford of FES talks about making money and the importance of saving money.   |
| <b>Banking I</b>                       | In this video, James Langford of FES introduces students to banking.  |
| <b>Debt</b>                            | This video, featuring James Langford of FES, gives students an understanding of taking loans and getting into debt.   |
| <b>Investing</b>                       | In this video, James Langford of FES discusses investments and assets.  |
| <b>Stocks, Bonds, and Mutual Funds</b> | In this video, James Langford of FES introduces students to stocks, bonds, and mutual funds.  |
| <b>What Is Wealth?</b>                 | In this video, James Langford of FES examines the question "What is Wealth?"  |
| <b>Budgeting</b>                       | In this video, James Langford of FES talks about the importance of budgeting.   |
| <b>Banking II</b>                      | In this video, James Langford of FES discusses the various kinds of accounts that can be opened in a bank.  |
| <b>Credit Cards</b>                    | In this video, James Langford of FES discusses about credit card loans.   |
| <b>Careers</b>                         | In this video, James Langford of FES talks about income and careers.  |
|  | <b>Quiz</b>   |
| <b>8.12(A) Quiz</b>                    | This quiz assesses students' understanding and ability to solve real-world problems comparing how interest rate and loan length affect the cost of credit.  |
| <b>8.12(B) Quiz</b>                    | This quiz assesses students' understanding and ability to calculate the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest and over different periods using an online calculator. |
| <b>8.12(C) Quiz</b>                    | This quiz assesses students' understanding and ability to explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time.  |
| <b>8.12(D) Quiz</b>                    | This quiz assesses students' understanding and ability to calculate and compare simple interest and compound interest earnings.   |
| <b>8.12(E) Quiz</b>                    | This quiz assesses students' understanding and ability to identify and explain the advantages and disadvantages of different payment methods.   |
| <b>8.12(F) Quiz</b>                    | This quiz assesses students' understanding and ability to analyze situations to determine if they represent financially responsible   |



decisions and identify the benefits of financial responsibility and the costs of financial irresponsibility.

## 8.12(G) Quiz

This quiz assesses students' understanding and ability to estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college.