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# ac / TEKS  Alignment

Dynamic, Interactive Learning
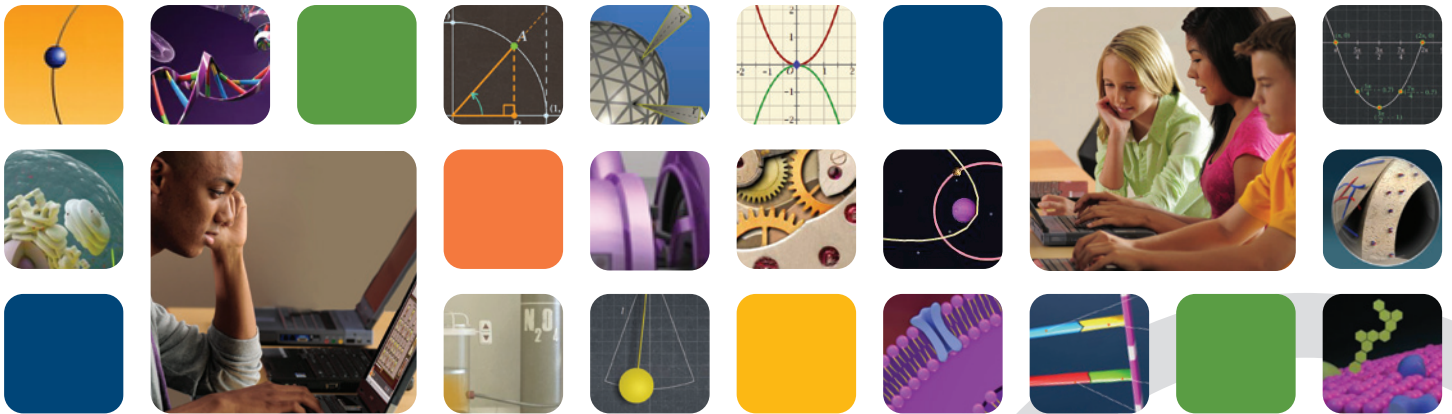
# ac / TEKS Alignment

## Table of Contents

# STAAR Readiness and Supporting Standards

## Readiness Standards

These standards are considered essential for success in the current grade or course. They support college and career readiness as well as address broad, deep ideas with in-depth instruction.

## Supporting Standards

These standards play a role in preparing students for the next grade though not a central role. They address more narrowly defined ideas and may be emphasized in a subsequent or previous year.

# AC Math Activity Objects consist of five different types:

## 1. Concept Development

These activities introduce concepts through engaging, real-world scenarios and develop these concepts using an inquiry-based approach.

## 2. Interactive Exercise

These activities provide learners with additional opportunities to develop conceptual understanding.

## 3. Skills Application

These activities help learners apply and extend their knowledge and practice essential mathematical skills.

## 4. Problem Solving

These activities engage learners with a guided problem-solving process to apply and enhance their mathematical understanding.

## 5. Visual Proofs

These activities provide learners with visual justification of formulas, theorems and relationships.
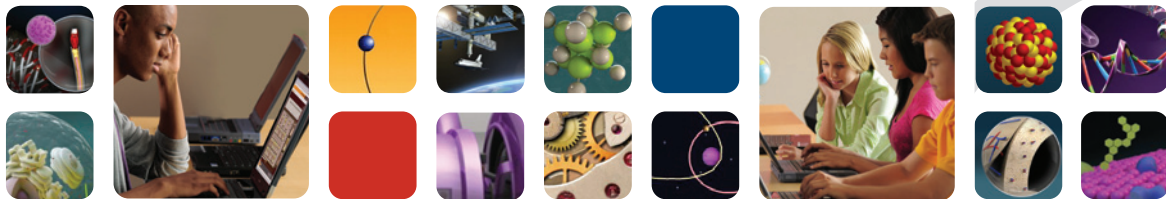
# ac / TEKS Math Alignment

## Middle School Grade 6 - Introduction

The desire to achieve education excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the College and Career Readiness Standards. By embedding statistics, probability, finance, and focusing on fluency and deep understandings, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

The process standards are integrated at every grade level. When possible, students will apply mathematics to problems arising in everyday life, society and the workplace. Students will use a problem solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, evaluating the problem-solving problem process and reasonableness of the solution. They will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, formulas, theorems, and number sense to solve problems efficiently. Effective communication of mathematical ideas, reasoning, and their implications using multiple representations, such as symbols, diagrams, graphs and language will be emphasized. They will use mathematical relationships to generate solutions and make connections and predictions.  Students will analyze mathematical relationships to connect and communicate mathematical ideas. They will

explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

The primary focal points at Grade 6 are number operations; proportionality; expressions, equations and relationships; and measurement and data.   Students use concepts, algorithms, and properties of rational numbers to explore mathematical relationships and to describe increasingly complex situations. Students use concepts of proportionality to explore, develop, and communicate mathematical relationships. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other; and they connect verbal, numeric, graphic, and symbolic representations of relationships including equations and inequalities. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and solve problems. Students communicate information about geometric figures or situations by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, and reasoning to draw conclusions, evaluate arguments, and make recommendations.  While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology.

# MIDDLE SCHOOL GRADE 6
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 1.A | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Compare and order non-negative rational numbers; | Compare and Order Proper Fractions | | ▼ |
| 1.B | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Generate equivalent forms of rational numbers including whole numbers, fractions, and decimals; | Equivalent Fractions | ● | |
| | | | Decimal Representations | ● | |
| 1.C | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Use integers to represent real-life situations | Round Whole Numbers | | ▼ |
| 1.D | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Write prime factorizations using exponents | Special Numbers | | ▼ |
| | | | Prime Factorization | | ▼ |
| 1.E | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers | Greatest Common Factor of Numbers | | ▼ |
| 1.F | Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to | Identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers | Finding Least Common Multiples | | ▼ |
| | | | | | |
| 2.A | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to | Model addition and subtraction situations involving fractions with objects, pictures, words, and numbers | Adding and Subtracting Fractions and Mixed Numbers | | ▼ |
| 2.B | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to | Use addition and subtraction to solve problems involving fractions and decimals | Solving Problems Using Money | ● | |

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# MIDDLE SCHOOL GRADE 6
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 2.C | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to | Use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates | Solving Problems Using Proportions | ● | |
| | | | Problem Solving Involving Ratio and Proportion | ● | |
| | | | Puzzle It! Number Relationships on Operation | ● | |
| 2.D | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to | Estimate and round to approximate reasonable results and to solve problems where exact answers are not required | Round Whole Numbers | | ▼ |
| 3.A | Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships. The student is expected to | Use ratios to describe proportional situations | Solving Problems Using Proportions | | ▼ |
| | | | Problem Solving Involving Ratio and Proportion | | ▼ |
| 3.B | Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships. The student is expected to | Represent ratios and percents with concrete models, fractions, and decimals | Park Planning Using Rational Numbers | | ▼ |
| | | | Using a Percent Model | | ▼ |
| 4.B | Patterns, relationships, and algebraic thinking. The student uses letters as variables in mathematical expressions to describe how one quantity changes when a related quantity changes. The student is expected to | Use tables of data to generate formulas representing relationships involving perimeter, area, volume of a rectangular prism, etc. | Formula for the Area of a Circle | | ▼ |
| | | | Formula for the Volume of a Cone | | ▼ |
| 5.A | Patterns, relationships, and algebraic thinking. The student uses letters to represent an unknown in an equation. The student is expected to | Formulate equations from problem situations described by linear relationships | Different Forms of Representation for a Relationship | ● | |
| | | | Translating Problems Into One-Step Equations | ● | |

MATH ACTIVITY OBJECTS

MATH ACTIVITY OBJECTS

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 6.A | Geometry and spatial reasoning. The student uses geometric vocabulary to describe angles, polygons, and circles. The student is expected to | Use angle measurements to classify angles as acute, obtuse, or right | Angles and Types of Angles | | ▼ |
| 6.B | Geometry and spatial reasoning. The student uses geometric vocabulary to describe angles, polygons, and circles. The student is expected to | Identify relationships involving angles in triangles and quadrilaterals | Interior and Exterior Angles of a Triangle | | ▼ |
| | | | Sum of the Exterior Angles of Polygons | | ▼ |
| | | | Interior Angles of the Polygons | | ▼ |
| 6.C | Geometry and spatial reasoning. The student uses geometric vocabulary to describe angles, polygons, and circles. The student is expected to | Describe the relationship between radius, diameter, and circumference of a circle | Ratio of a Circle's Circumference to Its Diameter | ● | |
| | | | Calculating the Circumference of a Circle | ● | |
| 8.A | Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles. The student is expected to | Estimate measurements (including circumference) and evaluate reasonableness of results | Conversion of the Area Measures | | ▼ |
| 8.B | Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles. The student is expected to | Select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight | Conversion of Length Measures | ● | |
| | | | Conversion of the Area Measures | ● | |
| | | | Conversion of Volume Measures | ● | |
| | | | Measuring Time | ● | |
| | | | Area of Composite Shapes | ● | |
| | | | Area of a Parallelogram | ● | |
| | | | Area of Trapezoids | ● | |
| | | | Problem Solving Involving Volumes of Prisms | ● | |
| 8.C | Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles. The student is expected to | Measure angles | Angles and Types of Angles | | ▼ |
| 8.D | Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, volume, weight, and angles. The student is expected to | Convert measures within the same measurement system (customary and metric) based on relationships between units | Conversion of Length Measures | | ▼ |
| | | | Conversion of the Area Measures | | ▼ |
| | | | Conversion of Volume Measures | | ▼ |
| | | | Measuring Time | | ▼ |

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# MIDDLE SCHOOL GRADE 6
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 9.A | Probability and statistics. The student uses experimental and theoretical probability to make predictions. The student is expected to | Construct sample spaces using lists and tree diagrams | Fundamental Counting Principle | | ▼ |
| | | | The Concept of Probability | | ▼ |
| | | | Probability Using Tree Diagrams | | ▼ |
| 9.B | Probability and statistics. The student uses experimental and theoretical probability to make predictions. The student is expected to | Find the probabilities of a simple event and its complement and describe the relationship between the two | The Concept of Probability | | ▼ |
| 10.A | Probability and statistics. The student uses statistical representations to analyze data. The student is expected to | Select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and stem and leaf plot | Find the Appropriate Graph | | ▼ |
| | | | Line Plot | | ▼ |
| | | | Interpreting Bar Graphs | | ▼ |
| | | | Bar Graphs and Line Graphs | | ▼ |
| | | | Stem and Leaf Plot | | ▼ |
| 10.B | Probability and statistics. The student uses statistical representations to analyze data. The student is expected to | Identify mean (using concrete objects and pictorial models), median, mode, and range of a set of data | Mean, Median and Mode | | ▼ |
| | | | Calculate Mean, Median, Mode | | ▼ |
| 10.C | Probability and statistics. The student uses statistical representations to analyze data. The student is expected to | Sketch circle graphs to display data; | Circle Graphs | | ▼ |
| 10.D | Probability and statistics. The student uses statistical representations to analyze data. The student is expected to | Solve problems by collecting, organizing, displaying, and interpreting data | Line Plot | ● | |
| | | | Pictograph | ● | |
| | | | Circle Graphs | ● | |
| | | | Bar Graphs and Line Graphs | ● | |
| | | | Drawing Bar Graphs | ● | |
| | | | Double Bar Graphs | ● | |
| | | | Interpreting Bar Graphs | ● | |

MATH ACTIVITY OBJECTS
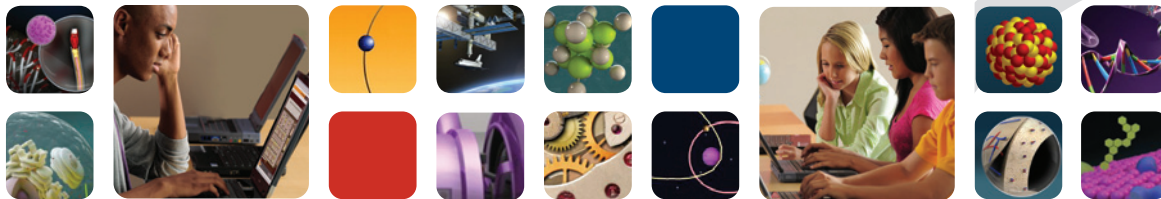
# ac / TEKS Math Alignment

## Middle School Grade 7 - Introduction

The desire to achieve education excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the College and Career Readiness Standards. By embedding statistics, probability, finance, and focusing on fluency and deep understandings, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

The process standards are integrated at every grade level. When possible, students will apply mathematics to problems arising in everyday life, society and the workplace. Students will use a problem solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, evaluating the problem-solving problem process and reasonableness of the solution. They will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, formulas, theorems, and number sense to solve problems efficiently. Effective communication of mathematical ideas, reasoning, and their implications using multiple representations, such as symbols, diagrams, graphs and language will be emphasized. They will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. They will explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

The primary focal points at Grade 7 are number operations; proportionality; expressions, equations and relationships; and measurement and data. Students use concepts, algorithms, and properties of rational numbers to explore mathematical relationships and to describe increasingly complex situations. Students use concepts of proportionality to explore, develop, and communicate mathematical relationships including number; geometry and measurement; and statistics and probability. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other; and they connect verbal, numeric, graphic, and symbolic representations of relationships including equations and inequalities. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and solve problems. Students communicate information about geometric figures or situations by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, and reasoning to draw conclusions, evaluate arguments, and make recommendations. While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology.

MATH ACTIVITY OBJECTS

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 1.A | Number, operation, and quantitative reasoning. The student represents and uses numbers in a variety of equivalent forms. The student is expected to | Compare and order integers and positive rational numbers | Compare and Order Proper Fractions | | ▼ |
| | | | Compare and Order Decimals with Races | | ▼ |
| 1.B | Number, operation, and quantitative reasoning. The student represents and uses numbers in a variety of equivalent forms. The student is expected to | Convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator | Decimal Representations | ● | |
| 1.C | Number, operation, and quantitative reasoning. The student represents and uses numbers in a variety of equivalent forms. The student is expected to | Represent squares and square roots using geometric models. | Estimating Square Root of Non-Perfect Squares | | ▼ |
| 2.A | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Represent multiplication and division situations involving fractions and decimals with concrete models, pictures, words, and numbers | Multiplication of Fractions | | ▼ |
| | | | Division of Fractions | | ▼ |
| 2.B | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals | Adding and Subtracting Fractions and Mixed Numbers | ● | |
| | | | Multiplication of Fractions | ● | |
| | | | Division of Fractions | ● | |
| | | | Solving Problems Using Money | ● | |
| 2.C | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Use models, such as concrete objects, pictorial models, and number lines, to add, subtract, multiply, and divide integers and connect the actions to algorithms | Subtraction of Integers | | ▼ |
| | | | Addition of Integers | | ▼ |
| 2.D | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratio | Solving Problems Using Proportions | | ▼ |
| | | | Problem Solving Involving Ratio and Proportion | | ▼ |
| 2.F | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Select and use appropriate operations to solve problems and justify the selections | Solving Problems Using Money | ● | |

# MIDDLE SCHOOL GRADE 7
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 2.G | Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, or divides to solve problems and justify solutions. The student is expected to | Determine the reasonableness of a solution to a problem | Problem Solving Involving Ratio and Proportion | | ▼ |
| 3.A | Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships. The student is expected to | Estimate and find solutions to application problems involving percent | Using a Percent Model | ● | |
| | | | Use Percent Proportion to Solve Problems | ● | |
| | | | Simple Interest | ● | |
| 3.B | Patterns, relationships, and algebraic thinking. The student solves problems involving direct proportional relationships. The student is expected to | Estimate and find solutions to application problems involving proportional relationships such as similarity, scaling, unit costs, and related measurement units | Scale Drawing | ● | |
| 4.A | Patterns, relationships, and algebraic thinking. The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to | Generate formulas involving unit conversions within the same system (customary and metric), perimeter, area, circumference, volume, and scaling | Conversion of Length Measures | | ▼ |
| | | | Conversion of the Area Measures | | ▼ |
| | | | Conversion of Volume Measures | | ▼ |
| 4.C | Patterns, relationships, and algebraic thinking. The student represents a relationship in numerical, geometric, verbal, and symbolic form. The student is expected to | Use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence | The General Rule for Input/Output Tables | | ▼ |
| 5.B | Patterns, relationships, and algebraic thinking. The student uses equations to solve problems. The student is expected to | Formulate problem situations when given a simple equation and formulate an equation when given a problem situation. | Translating Problems Into One-Step Equations | ● | |
| 6.A | Geometry and spatial reasoning. The student compares and classifies two- and three-dimensional figures using geometric vocabulary and properties. The student is expected to | Use angle measurements to classify pairs of angles as complementary or supplementary | Angles and Types of Angles | | ▼ |

MATH ACTIVITY OBJECTS

# MIDDLE SCHOOL GRADE 7
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 6.B | Geometry and spatial reasoning. The student compares and classifies two- and three-dimensional figures using geometric vocabulary and properties. The student is expected to | Use properties to classify triangles and quadrilaterals | Types of Triangles | | ▼ |
| | | | Classification of Quadrilaterals | | ▼ |
| 6.D | Geometry and spatial reasoning. The student compares and classifies two- and three-dimensional figures using geometric vocabulary and properties. The student is expected to | Use critical attributes to define similarity | Let's Find Congruent Triangles | ● | |
| | | | Let's Find Similar Triangles | ● | |
| 7.A | Geometry and spatial reasoning. The student uses coordinate geometry to describe location on a plane. The student is expected to | Locate and name points on a coordinate plane using ordered pairs of integers; | Graphs of One-Step Linear Equations | | ▼ |
| | | | Graphs of Two-Step Linear Equations | | ▼ |
| 7.B | Geometry and spatial reasoning. The student uses coordinate geometry to describe location on a plane. The student is expected to | Graph reflections across the horizontal or vertical axis and graph translations on a coordinate plane | Application of Translation | ● | |
| | | | Drawing the Reflection of a Figure | ● | |
| 8.A | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Sketch three-dimensional figures when given the top, side, and front views | Drawing 2D Views of a 3D Object | | ▼ |
| | | | Completing the Missing 2D View of a 3D Object | | ▼ |
| 8.B | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Make a net (two-dimensional model) of the surface area of a three-dimensional figure | Observing Changes in Surface Area of Regular Prisms | | ▼ |
| | | | Observing Changes in Surface Area of Square Pyramids | | ▼ |
| | | | Observing Changes in Surface Area of Cylinders | | ▼ |
| | | | Observing Changes in Surface Area of Cones | | ▼ |
| 8.C | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Use geometric concepts and properties to solve problems in fields such as art and architecture | Using the Pythagorean Theorem to Solve Problems | | ▼ |

MATH ACTIVITY OBJECTS

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| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 9.A | Measurement. The student solves application problems involving estimation and measurement. The student is expected to | Estimate measurements and solve application problems involving length (including perimeter and circumference) and area of polygons and other shapes | Area of Composite Shapes | ● | |
| | | | Area of Parallelogram | ● | |
| | | | Area of Trapezoids | ● | |
| 9.C | Measurement. The student solves application problems involving estimation and measurement. The student is expected to | Estimate measurements and solve application problems involving volume of prisms (rectangular and triangular) and cylinders | Problem Solving Involving Volumes of Prisms | ● | |
| 10.A | Probability and statistics. The student recognizes that a physical or mathematical model (including geometric) can be used to describe the experimental and theoretical probability of real-life events. The student is expected to | Construct sample spaces for simple or composite experiments | The Concept of Probability | | ▼ |
| | | | Overlapping and Mutually Exclusive Events | | ▼ |
| 10.B | Probability and statistics. The student recognizes that a physical or mathematical model (including geometric) can be used to describe the experimental and theoretical probability of real-life events. The student is expected to | Find the probability of independent events | Find the Given Probability | | ▼ |
| 11.A | Probability and statistics. The student understands that the way a set of data is displayed influences its interpretation. The student is expected to | Select and use an appropriate representation for presenting and displaying relationships among collected data, including line plot, line graph, bar graph, stem and leaf plot, circle graph, and Venn diagrams, and justify the selection | Find the Appropriate Graph | | ▼ |
| | | | Line Plot | | ▼ |
| | | | Bar Graphs and Line Graphs | | ▼ |
| | | | Stem and Leaf Plot | | ▼ |
| | | | Circle Graphs | | ▼ |
| 11.B | Probability and statistics. The student understands that the way a set of data is displayed influences its interpretation. The student is expected to | Make inferences and convincing arguments based on an analysis of given or collected data | Line Plot | ● | |
| 12.A | Probability and statistics. The student uses measures of central tendency and variability to describe a set of data. The student is expected to | Describe a set of data using mean, median, mode, and range | Calculate Mean, Median, Mode | | ▼ |
| | | | Mean, Median and Mode | | ▼ |

MATH ACTIVITY OBJECTS
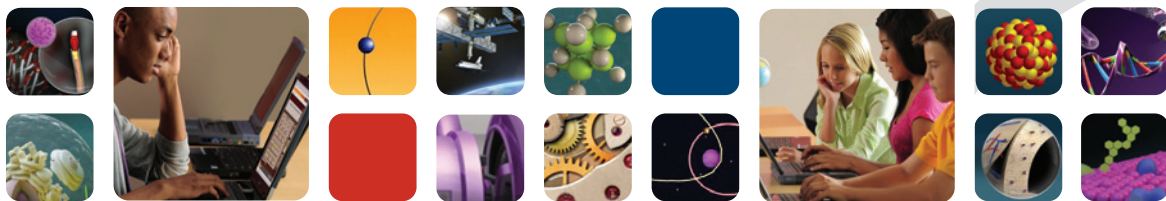
# ac / TEKS Math Alignment

## Middle School Grade 8 - Introduction

The desire to achieve academic excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the College and Career Readiness Standards. By including statistics, probability, and personal finance, as well as focusing on building fluency and deep understandings of mathematical concepts, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

The process standards are integrated at every grade level. When possible, students will apply mathematics to problems arising in everyday life, society and the workplace. Students will use a problem solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, evaluating the problem-solving process and reasonableness of the solution. They will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, formulas, theorems, and number sense to solve problems efficiently. Effective communication of mathematical ideas, reasoning, and their implications using multiple representations, such as symbols, diagrams, graphs and language will be emphasized. They will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. They will explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

The primary focal points at Grade 8 are proportionality; expressions, equations, relationships and foundations of functions; and measurement and data. Students use concepts, algorithms, and properties of real numbers to explore mathematical relationships and to describe increasingly complex situations. Students use concepts of proportionality to explore, develop, and communicate mathematical relationships. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other; and they connect verbal, numeric, graphic, and symbolic representations of relationships including equations and inequalities. Students begin to develop an understanding of functional relationships. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and solve problems. Students communicate information about geometric figures or situations by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, and reasoning to draw conclusions, evaluate arguments, and make recommendations. While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology.

# MIDDLE SCHOOL GRADE 8
## Texas Knowledge and Skills (TEKS)

MATH ACTIVITY OBJECTS

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 1.A | Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to | Compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals | Compare and Order Proper Fractions | ● | |
| | | | Compare and Order Mixed Numbers | ● | |
| | | | Compare and Order Decimals with Races | ● | |
| 1.B | Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to | Select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships | Solving Problems Using Proportions | | ▼ |
| | | | Problem Solving Involving Ratio and Proportion | | ▼ |
| | | | Scale Drawing | | ▼ |
| 1.C | Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to | Approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as pi, Ö2) | Ratio of a Circle's Circumference to Its Diameter | | ▼ |
| | | | Estimating Square Root of Non-Perfect Squares | | ▼ |
| 1.D | Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to | Express numbers in scientific notation, including negative exponents, in appropriate problem situations | Puzzle It! Operations on Numbers in Scientific Notation | | ▼ |
| 2.A | Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to | Select appropriate operations to solve problems involving rational numbers and justify the selections | Solving Problems Using Money | | ▼ |
| | | | Problem Solving Involving Ratio and Proportion | | ▼ |
| | | | Solving Problems Using Proportions | | ▼ |
| 2.B | Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to | Use appropriate operations to solve problems involving rational numbers in problem situations | Solving Problems Using Money | ● | |
| | | | Problem Solving Involving Ratio and Proportion | ● | |
| | | | Solving Problems Using Proportions | ● | |
| 2.C | Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to | Evaluate a solution for reasonableness | Problem Solving Involving Ratio and Proportion | | ▼ |
| 2.D | Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to | Use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems | Scale Drawing | | ▼ |
| | | | Conversion of Volume Measures | | ▼ |
| | | | Conversion of Length Measures | | ▼ |
| | | | Simple Interest | | ▼ |
| | | | Percentage of Mixtures | | ▼ |
| | | | Use Percent Proportion to Solve Problems | | ▼ |

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# MIDDLE SCHOOL GRADE 8
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 3.B | Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to | Estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates | Use Percent Proportion to Solve Problems | ● | |
| 4.A | Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to | Generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description). | Different Forms of Representation for a Relationship | ● | |
| 5.A | Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to | Predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations | Graphs of One-Step Linear Equations | ● | |
| | | | Graphs of Two-Step Linear Equations | ● | |
| 5.B | Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to | Find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change) | Evaluation of Algebraic Expressions | | ▼ |
| | | | The General Rule for Input/Output Tables | | ▼ |
| 7.A | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Draw three-dimensional figures from different perspectives | Drawing 2D Views of a 3D Object | | ▼ |
| | | | Completing the Missing 2D View of a 3D Object | | ▼ |
| 7.B | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Use geometric concepts and properties to solve problems in fields such as art and architecture | Using the Pythagorean Theorem to Solve Problems | | ▼ |
| 7.C | Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to | Use pictures or models to demonstrate the Pythagorean Theorem | Proof of the Pythagorean Theorem | | ▼ |
| 8.A | Measurement. The student uses procedures to determine measures of three-dimensional figures. The student is expected to | Find lateral and total surface area of prisms, pyramids, and cylinders using concrete models and nets (two-dimensional models) | Observing Changes in Surface Area of Regular Prisms | | ▼ |
| | | | Observing Changes in Surface Area of Square Pyramids | | ▼ |
| | | | Observing Changes in Surface Area of Cylinders | | ▼ |

MATH ACTIVITY OBJECTS

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 8.B | Measurement. The student uses procedures to determine measures of three-dimensional figures. The student is expected to | Connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects | Formula for the Volume of a Sphere | | ▼ |
| | | | Formula for the Volume of a Cone | | ▼ |
| 8.C | Measurement. The student uses procedures to determine measures of three-dimensional figures. The student is expected to | Estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume. | Problem Solving Involving Volumes of Prisms | ● | |
| 9.A | Measurement. The student uses indirect measurement to solve problems. The student is expected to | Use the Pythagorean Theorem to solve real-life problems | Using the Pythagorean Theorem to Solve Problems | ● | |
| 9.B | Measurement. The student uses indirect measurement to solve problems. The student is expected to | Use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements | Let's Find Congruent Triangles | ● | |
| | | | Let's Find Similar Triangles | ● | |
| 10.A | Measurement. The student describes how changes in dimensions affect linear, area, and volume measures. The student is expected to | Describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally | The Relationship Between Perimeter and Area | | ▼ |
| 10.B | Measurement. The student describes how changes in dimensions affect linear, area, and volume measures. The student is expected to | Describe the resulting effect on volume when dimensions of a solid are changed proportionally | Observing Changes in Volume of Square Prisms | | ▼ |
| | | | Observing Changes in Volume of Cylinders | | ▼ |
| | | | Observing Changes in Volume of Quadrilateral Pyramids | | ▼ |
| 11.A | Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to | Find the probabilities of dependent and independent events | Find the Given Probability | ● | |
| 11.B | Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to | Use theoretical probabilities and experimental results to make predictions and decisions | Experimental and Theoretical Probabilities | | ▼ |
| | | | Analyze Experimental Probability Using Graphs | | ▼ |
| 11.C | Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to | Select and use different models to simulate an event | Find the Given Probability | ● | |

# MIDDLE SCHOOL GRADE 8
## Texas Knowledge and Skills (TEKS)

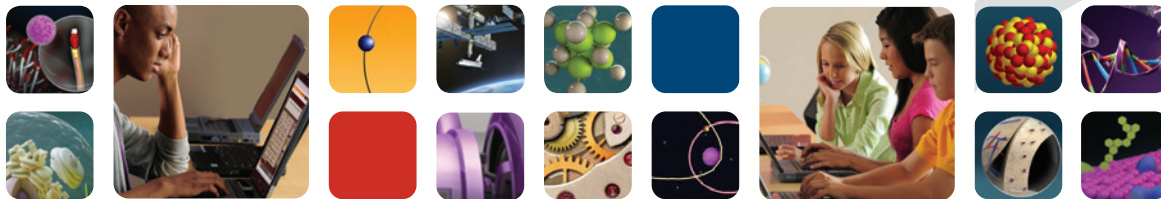| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 12.C | Probability and statistics. The student uses statistical procedures to describe data. The student is expected to | Select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology | Find the Appropriate Graph | | ▼ |
| | | | Line Plot | | ▼ |
| | | | Bar Graphs and Line Graphs | | ▼ |
| | | | Stem and Leaf Plot | | ▼ |
| | | | Circle Graphs | | ▼ |
| | | | Double Bar Graphs | | ▼ |
| | | | Box and Whisker Plots | | ▼ |
| | | | Histogram | | ▼ |

# ac / TEKS Math Alignment

## High School Algebra I - Introduction

The desire to achieve education excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics, guided by the Texas College and Career Readiness Standards. By embedding statistics, probability, and financial literacy, while focusing on fluency and deep understandings, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

The process standards are integrated at every grade level. When possible, students will apply mathematics to problems arising in everyday life, society and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process as well as the reasonableness of the solution. They will select appropriate tools, including real objects, manipulatives, paper and pencil, and technology and techniques, such as mental math, estimation, and number sense to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language. They will use mathematical relationships to generate solutions and make connections and predictions. Students will create and use representations to organize, record, and analyze mathematical relationships to connect and communicate mathematical ideas. They will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written and oral communications.

In Algebra I, students will build on grade 6-8 Mathematics Texas Essential Knowledge and Skills (TEKS), which provide a foundation in linear relationships, number and operations, and proportionality. Students will study linear, quadratic, and exponential functions and their related transformations, equations, and associated solutions. Students will connect functions and their associated solutions in both mathematical and real-world situations. Students will use technology to collect and explore data and analyze statistical relationships. In addition, students will study polynomials of degree one and two, radical expressions, sequences, and laws of exponents. Students will generate and solve linear systems with two equations and two variables and will create new functions through transformations.

# HIGH SCHOOL ALGEBRA I
Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 1.A | Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to | Describe independent and dependent quantities in functional relationships | The Concept of Function | | ▼ |
| | | | Domain and range of a function | | ▼ |
| 1.B | Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to | Gather and record data and use data sets to determine functional relationships between quantities | The Concept of Relation | | ▼ |
| 1.C | Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to | Describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations | The Concept of Function | | ▼ |
| 1.D | Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to | Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities | Different Forms of Representation for a Relationship | ● | |
| | | | Directly Varying Quantities and Their Graphs | ● | |
| | | | The Concept of Relation | ● | |
| 1.E | Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to | Interpret and make decisions, predictions, and critical judgments from functional relationships | The Domain and Range of a Function | ● | |
| 2.A | Foundations for functions. The student uses the properties and attributes of functions. The student is expected to | Identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x2$) parent functions | Introducing the quadratic function and its graph | | ▼ |
| 2.B | Foundations for functions. The student uses the properties and attributes of functions. The student is expected to | Identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete | Domain and range of a function | ● | |
| | | | Determining whether a relation is also a function | ● | |
| | | | The Range of a Quadratic Function | ● | |
| 3.B | Foundations for functions. The student understands how algebra can be used to express generalizations and recognizes and uses the power of symbols to represent situations. The student is expected to | Look for patterns and represent generalizations algebraically | Introducing the Quadratic Function and Its Graph | | ▼ |

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# HIGH SCHOOL ALGEBRA I
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 4.A | Foundations for functions. The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to | Find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations | Characteristics of Polynomials | ● | |
| | | | Factoring with Difference and Sum Formulas | ● | |
| | | | Solving One-Step Linear Equations | ● | |
| | | | Solving Two-Step Linear Equations | ● | |
| 4.B | Foundations for functions. The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to | Use the commutative, associative, and distributive properties to simplify algebraic expressions | Factoring with Difference and Sum Formulas | | ▼ |
| 5.A | Linear functions. The student understands that linear functions can be represented in different ways and translates among their various representations. The student is expected to | Determine whether or not given situations can be represented by linear functions | The Concept of Linearity | | ▼ |
| 5.C | Linear functions. The student understands that linear functions can be represented in different ways and translates among their various representations. The student is expected to | Use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions | Different Forms of Representation for a Relationship | ● | |
| 6.A | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations | The Concept of Slope | | ▼ |

# HIGH SCHOOL ALGEBRA I
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|:---:|:---:|
| 6.B | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs | Writing Equations in Slope-Intercept Form | ● | |
| | | | The Concept of Slope | ● | |
| 6.C | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$ | Writing Equations in Slope-Intercept Form | ● | |
| 6.D | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y-intercept | Writing Equations in Slope-Intercept Form | ▼ | |
| 6.E | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations | Writing Equations in Slope-Intercept Form | ▼ | |
| 6.F | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Interpret and predict the effects of changing slope and y-intercept in applied situations | The Concept of Slope | ● | |

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# HIGH SCHOOL ALGEBRA I
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 6.G | Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to | Relate direct variation to linear functions and solve problems involving proportional change | Directly Varying Quantities and Their Graphs | | ▼ |
| 7.B | Linear functions. The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities | Solving One-Step Linear Equations | ● | |
| | | | Solving Two-Step Linear Equations | ● | |
| | | | Solving One-Step Linear Inequalities | ● | |
| 7.C | Linear functions. The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Interpret and determine the reasonableness of solutions to linear equations and inequalities | Solving One-Step Linear Equations | | ▼ |
| | | | Solving Two-Step Linear Equations | | ▼ |
| | | | Solving One-Step Linear Inequalities | | ▼ |
| 8.A | Linear functions. The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Analyze situations and formulate systems of linear equations in two unknowns to solve problems | Solving Systems of Linear Equations Using the Elimination Method | | ▼ |
| | | | Solving Systems of Linear Equations Graphically | | ▼ |
| 8.B | Linear functions. The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods | Solving Systems of Linear Equations Using the Elimination Method | ● | |
| | | | Solving Systems of Linear Equations Graphically | ● | |

# HIGH SCHOOL ALGEBRA I
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 8.C | Linear functions. The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Interpret and determine the reasonableness of solutions to systems of linear equations | Solving Systems of Linear Equations Using the Elimination Method | | ▼ |
| | | | Solving Systems of Linear Equations Graphically | | ▼ |
| 9.A | Quadratic and other nonlinear functions. The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to | Determine the domain and range for quadratic functions in given situations | Introducing the Quadratic Function and Its Graph | | ▼ |
| | | | The Range of a Quadratic Function | | ▼ |
| 9.B | Quadratic and other nonlinear functions. The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to | Investigate, describe, and predict the effects of changes in "a" on the graph of $y = ax2 + c$ | Visualizing the Parabola | | ▼ |
| 9.C | Quadratic and other nonlinear functions. The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to | Investigate, describe, and predict the effects of changes in c on the graph of $y = ax2 + c$ | Visualizing the Parabola | | ▼ |
| 9.D | Quadratic and other nonlinear functions. The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to | Analyze graphs of quadratic functions and draw conclusions | Visualizing the Parabola | ● | |
| | | | A Quadratic Function Given in General and Vertex Form | ● | |

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# HIGH SCHOOL ALGEBRA I
## Texas Knowledge and Skills (TEKS)

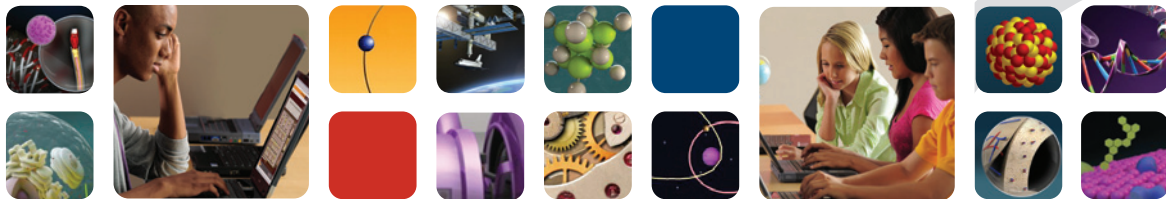| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|:---:|:---:|
| 10.A | Quadratic and other nonlinear functions. The student understands there is more than one way to solve a quadratic equation and solves them using appropriate methods. The student is expected to | Solve quadratic equations using concrete models, tables, graphs, and algebraic methods | Introducing the Quadratic Equations in One Variable | ● | |
| | | | Solving Quadratic Equations by Factoring | ● | |
| | | | Solving Quadratic Equations by Completing the Square | ● | |
| | | | Solving Quadratic Equations using Quadratic Formula and Discriminant | ● | |
| 10.B | Quadratic and other nonlinear functions. The student understands there is more than one way to solve a quadratic equation and solves them using appropriate methods. The student is expected to | Make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function | Roots and Coefficients of a Quadratic Equation | | ▼ |
| | | | Graphing a Quadratic Function: Vertex Form | | ▼ |
| | | | Graphing a Quadratic Function: Intercept Form | | ▼ |
| | | | Graphing a Quadratic Function: General Form | | ▼ |
| 11.A | Quadratic and other nonlinear functions. The student understands there are situations modeled by functions that are neither linear nor quadratic and models the situations. The student is expected to | Use patterns to generate the laws of exponents and apply them in problem-solving situations | Exponents and Their Properties | | ▼ |

# ac / TEKS Math Alignment

## High School Algebra II - Introduction

The desire to achieve educational excellence is the driving force behind the Texas Essential Knowledge and Skills for mathematics guided by the Texas College and Career Readiness Standards. By embedding statistics, probability, finance, and focusing on fluency and deep understandings, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

The process standards are integrated at every grade level. When possible students will apply mathematics to problems arising in everyday life, society and the workplace. Students will use a problem solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution and evaluating the problem-solving process. They will select tools such as real objects, manipulatives, paper and pencil, and technology or techniques such as mental math, estimation, reasonableness, and number sense to solve problems. Communication of mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs and language will be emphasized. Students will create and use representations to organize, record, and communicate mathematical ideas. They will explain, display, or justify mathematical ideas and arguments using precise mathematical language in written or oral communications.

In Algebra II students build on the foundations from K-8 and Algebra I. Students broaden their knowledge of quadratic functions, exponential functions and systems of equations. They study logarithmic, square root, cubic, cube root, absolute value, rational functions and their related equations. Students connect functions to their inverses and to their associated equations and solutions in both mathematical and real world situations. In addition, students extend their knowledge of data analysis and numeric and algebraic methods.

# HIGH SCHOOL ALGEBRA II
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|:---:|:---:|
| 1.A | Foundations for functions. The student uses properties and attributes of functions and applies functions to problem situations. The student is expected to | Identify the mathematical domains and ranges of functions and determine reasonable domain and range values for continuous and discrete situations | The Domain and Range of Functions | ● | |
| | | | Determining Whether a Relation is also a Function | ● | |
| | | | The Range of a Quadratic Function | ● | |
| 2.A | Foundations for functions. The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to | Use tools including factoring and properties of exponents to simplify expressions and to transform and solve equations | Factoring with Difference and Sum Formulas | | ▼ |
| | | | Exponents and Their Properties | | ▼ |
| 3.A | Foundations for functions. The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. The student is expected to | Analyze situations and formulate systems of equations in two or more unknowns or inequalities in two unknowns to solve problems | Solving Systems of Linear Equations Using the Elimination Method | ● | |
| | | | Solving Systems of Linear Equations Graphically | ● | |
| | | | Graphing Systems of Linear Inequalities | ● | |
| 3.B | Foundations for functions. The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. The student is expected to | Use algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities | Solving Systems of Linear Equations Using the Elimination Method | ● | |
| | | | Solving Systems of Linear Equations Graphically | ● | |
| | | | Graphing Systems of Linear Inequalities | ● | |
| 3.C | Foundations for functions. The student formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations. The student is expected to | Interpret and determine the reasonableness of solutions to systems of equations or inequalities for given contexts | Solving Systems of Linear Equations Using the Elimination Method | ● | |
| | | | Solving Systems of Linear Equations Graphically | ● | |
| | | | Graphing Systems of Linear Inequalities | ● | |

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# HIGH SCHOOL ALGEBRA II
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 4.C | Algebra and geometry. The student connects algebraic and geometric representations of functions. The student is expected to | Describe and analyze the relationship between a function and its inverse. | Fundamental Concepts of the Inverses of Functions | | ▼ |
| | | | | | |
| 6.A | Quadratic and square root functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations. The student is expected to | Determine the reasonable domain and range values of quadratic functions, as well as interpret and determine the reasonableness of solutions to quadratic equations and inequalities | Introducing the Quadratic Function and Its Graph | ● | |
| | | | The Range of a Quadratic Function | ● | |
| | | | Solving Quadratic Equations using Quadratic Formula and Discriminant | ● | |
| | | | Solving Quadratic Inequalities by Graphing | ● | |
| 6.B | Quadratic and square root functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations. The student is expected to | Relate representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions | Introducing the Quadratic Function and Its Graph | ● | |
| | | | Visualizing the Parabola | ● | |
| | | | Introducing the Quadratic Equations in One Variable | ● | |
| 6.C | Quadratic and square root functions. The student understands that quadratic functions can be represented in different ways and translates among their various representations. The student is expected to | Determine a quadratic function from its roots (real and complex) or a graph | Finding the Equation of a Parabola | | ▼ |
| | | | | | |
| 7.A | Quadratic and square root functions. The student interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations. The student is expected to | Use characteristics of the quadratic parent function to sketch the related graphs and connect between the $y = ax^2 + bx + c$ and the $y = a(x - h)^2 + k$ symbolic representations of quadratic functions | A Quadratic Function Given in General and Vertex Form | ● | |
| | | | Graphing a Quadratic Function: Vertex Form | ● | |
| | | | Graphing a Quadratic Function: Intercept Form | ● | |
| | | | Graphing a Quadratic Function: General Form | ● | |
| 7.B | Quadratic and square root functions. The student interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations. The student is expected to | Use the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of $y = a(x - h)^2 + k$ form of a function in applied and purely mathematical situations. | Visualizing the Parabola | | ▼ |

MATH ACTIVITY OBJECTS

# HIGH SCHOOL ALGEBRA II
## Texas Knowledge and Skills (TEKS)

| State ID | TEKS | Student Expectation | Activity Object | Readiness Standard | Supporting Standard |
|---|---|---|---|---|---|
| 8.A | Quadratic and square root functions. The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Analyze situations involving quadratic functions and formulate quadratic equations or inequalities to solve problems | Solving Quadratic Equations by Factoring | ● | |
| | | | Solving Quadratic Equations by Completing the Square | ● | |
| 8.B | Quadratic and square root functions. The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Analyze and interpret the solutions of quadratic equations using discriminants and solve quadratic equations using the quadratic formula | Solving Quadratic Equations using Quadratic Formula and Discriminant | | ▼ |
| 8.C | Quadratic and square root functions. The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Compare and translate between algebraic and graphical solutions of quadratic equations | Roots and Coefficients of a Quadratic Equation | | ▼ |
| 8.D | Quadratic and square root functions. The student formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Solve quadratic equations and inequalities using graphs, tables, and algebraic methods. | Solving Quadratic Equations by Factoring | ● | |
| | | | Solving Quadratic Equations by Completing the Square | ● | |
| | | | Solving Quadratic Equations using Quadratic Formula and Discriminant | ● | |
| | | | Solving Quadratic Inequalities by Graphing | ● | |
| 10.G | Rational functions. The student formulates equations and inequalities based on rational functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Use functions to model and make predictions in problem situations involving direct and inverse variation | Directly Varying Quantities and Their Graphs | | ▼ |
| 11.F | Exponential and logarithmic functions. The student formulates equations and inequalities based on exponential and logarithmic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to | Analyze a situation modeled by an exponential function, formulate an equation or inequality, and solve the problem | | ● | |