

Academic Outcomes

Mathematics

Mathematic Content Standards Overview:

TK/ Kindergarten

Counting and Cardinality: Know number names and the count sequence.

Count to tell the number of objects.

Compare numbers.

Operations and Algebraic Thinking:

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Number and Operations in Base Ten:

Work with numbers 11–19 to gain foundations for place value.

Measurement and Data:

Describe and compare measurable attributes.

Classify objects and count the number of objects in categories.

Geometry:

Identify and describe shapes.

Analyze, compare, create, and compose shapes.

1st Grade

Operations and Algebraic Thinking:

Represent and solve problems involving addition and subtraction.

Understand and apply properties of operations and the relationship between addition and subtraction.

Add and subtract within 20.

Work with addition and subtraction equations.

Number and Operations in Base Ten:

Extend the counting sequence.

Understand place value.

Use place value understanding and properties of operations to add and subtract.

Measurement and Data:

Measure lengths indirectly and by iterating length units.

Tell and write time.

Represent and interpret data.

Geometry:

Reason with shapes and their attributes.

2nd Grade

Operations and Algebraic Thinking:

Represent and solve problems involving addition and subtraction.

Add and subtract within 20.

Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten:

Understand place value.

Use place value understanding and properties of operations to add and subtract.

Measurement and Data:

Measure and estimate lengths in standard units.

Relate addition and subtraction to length.

Work with time and money.

Represent and interpret data.

Geometry:

Reason with shapes and their attributes.

3rd Grade

Operations and Algebraic Thinking:

Represent and solve problems involving multiplication and division.

Understand properties of multiplication and the relationship between multiplication and division.

Multiply and divide within 100.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Number and Operations in Base Ten:

Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions:

Develop understanding of fractions as numbers.

Measurement and Data:

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Represent and interpret data.

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry:

Reason with shapes and their attributes.

4th Grade

Operations and Algebraic Thinking:

Use the four operations with whole numbers to solve problems.

Gain familiarity with factors and multiples.

Generate and analyze patterns.

Number and Operations in Base Ten:

Generalize place value understanding for multi-digit whole numbers.

Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions:

Extend understanding of fraction equivalence and ordering.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data:

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Represent and interpret data.

Geometric measurement: understand concepts of angle and measure angles.

Geometry:

Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

5th Grade

Operations and Algebraic Thinking:

Write and interpret numerical expressions.

Analyze patterns and relationships.

Number and Operations in Base Ten:

Understand the place value system.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

Number and Operations—Fractions:

Use equivalent fractions as a strategy to add and subtract fractions.

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data:

Convert like measurement units within a given measurement system.

Represent and interpret data.

Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Geometry:

Graph points on the coordinate plane to solve real-world and mathematical problems.

Classify two-dimensional figures into categories based on their properties.

6th Grade

Ratios and Proportional Relationships:

Understand ratio concepts and use ratio reasoning to solve problems.

The Number System:

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Compute fluently with multi-digit numbers and find common factors and multiples.

Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations:

Apply and extend previous understandings of arithmetic to algebraic expressions.

Reason about and solve one-variable equations and inequalities.

Represent and analyze quantitative relationships between dependent and independent variables.

Geometry:

Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability:

Develop understanding of statistical variability.

Summarize and describe distributions.

7th Grade

Ratios and Proportional Relationships:

Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System:

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Expressions and Equations:

Use properties of operations to generate equivalent expressions.

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry:

Draw, construct and describe geometrical figures and describe the relationships between them.

Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Statistics and Probability:

Use random sampling to draw inferences about a population.

Draw informal comparative inferences about two populations.

Investigate chance processes and develop, use, and evaluate probability models.

8th Grade

The Number System:

Know that there are numbers that are not rational, and approximate them by rational numbers.

Expressions and Equations:

Work with radicals and integer exponents.

Understand the connection between proportional relationships, lines, and linear equations.

Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions:

Define, evaluate, and compare functions.

Use functions to model relationships between quantities.

Geometry:

Understand congruence and similarity using physical models, transparencies, or geometry software.

Understand and apply the Pythagorean Theorem.

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Statistics and Probability:

Investigate patterns of association in bivariate data.

9th Grade

Number and Quantity Quantities:

Reason quantitatively and use units to solve problems.

Algebra Seeing Structure in Expressions:

Interpret the structure of expressions.

Creating Equations:

Create equations that describe numbers or relationships.

Reasoning with Equations and Inequalities:

Understand solving equations as a process of reasoning and explain the reasoning.

Solve equations and inequalities in one variable.

Solve systems of equations.

Represent and solve equations and inequalities graphically.

Functions Interpreting Functions:

Understand the concept of a function and use function notation.

Interpret functions that arise in applications in terms of the context.

Analyze functions using different representations.

Building Functions:

Build a function that models a relationship between two quantities.

Build new functions from existing functions.

Linear, Quadratic, and Exponential Models:

Construct and compare linear, quadratic, and exponential models and solve problems.

Interpret expressions for functions in terms of the situation they model.

Geometry Congruence:

Experiment with transformations in the plane.

Understand congruence in terms of rigid motions.

Make geometric constructions.

Expressing Geometric Properties with Equations:

Use coordinates to prove simple geometric theorems algebraically.

Statistics and Probability Interpreting Categorical and Quantitative Data:

Summarize, represent, and interpret data on a single count or measurement variable.

Summarize, represent, and interpret data on two categorical and quantitative variables.

Interpret linear models.

10th Grade

Number and Quantity The Real Number System:

Extend the properties of exponents to rational exponents.

Use properties of rational and irrational numbers.

The Complex Number Systems:

Perform arithmetic operations with complex numbers.

Use complex numbers in polynomial identities and equations.

Algebra Seeing Structure in Expressions:

Interpret the structure of expressions.

Write expressions in equivalent forms to solve problems.

Arithmetic with Polynomials and Rational Expressions

Perform arithmetic operations on polynomials.

Creating Equations:

Create equations that describe numbers or relationships.

Reasoning with Equations and Inequalities:

Solve equations and inequalities in one variable.

Solve systems of equations. Functions Interpreting Functions:

Interpret functions that arise in applications in terms of the context.

Analyze functions using different representations.

Building Functions:

Build a function that models a relationship between two quantities.

Build new functions from existing functions.

Linear, Quadratic, and Exponential Models:

Construct and compare linear, quadratic, and exponential models and solve problems.

Interpret expressions for functions in terms of the situation they model.

Geometry Congruence:

Prove geometric theorems.

Similarity, Right Triangles, and Trigonometry:

Understand similarity in terms of similarity transformations.

Prove theorems involving similarity.

Define trigonometric ratios and solve problems involving right triangles.

Circles:

Understand and apply theorems about circles.

Find arc lengths and areas of sectors of circles.

Expressing Geometric Properties with Equations:

Translate between the geometric description and the equation for a conic section.

Use coordinates to prove simple geometric theorems algebraically.

Geometric Measurement and Dimension:

Explain volume formulas and use them to solve problems.

Statistics and Probability Conditional Probability and the Rules of Probability:

Understand independence and conditional probability and use them to interpret data.

Use the rules of probability to compute probabilities of compound events in a uniform probability model.

Using Probability to Make Decisions:

Use probability to evaluate outcomes of decisions.